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SUBJECT

New Graduate Program: Ph.D., Geosciences – Boise State University

APPLICABLE STATUTE, RULE, OR POLICY

- Idaho State Board of Education Governing Policies and Procedures, Section III.G.4 and 5, Program Approval and Discontinuance
- Sections 33-107 (7), 33-4001. Idaho Code.

BACKGROUND

In accordance with Board policy III.G.4.(a) (1), Board approval is required prior to implementation of any new academic program, instructional unit, minor, option, or emphasis with a financial impact of $250,000 or more per year. In accordance with Board Policy III.G.4, (a) (2), the Executive Director is authorized to approve, prior to implementation, any new academic program, instructional unit, minor, option, or emphasis with a financial impact of less than $250,000 per year.

DISCUSSION

Boise State University proposes to offer a new Ph.D. program in Geosciences beginning with the fall 2006 semester. This program will give students, local industry, and state and federal agencies in southwest Idaho access to a research-intensive program with strengths in geology/geochemistry and surficial processes/geomorphology. The program will require 66 credits of academic coursework (including a dissertation) beyond the Bachelor's Degree and follow all policies and procedures of the Graduate College.

The proposed program builds on faculty research strengths in geology, hydrology, and geochemistry from across the university and is complementary to the existing doctoral program in geophysics. Faculty will work together on student recruitment, admission decisions, assignment of supervisory committees, design of comprehensive examinations, and the generation of financial support and research opportunities for students.

A number of programmatic controls and quality assurance activities are part of the management plan for the anticipated Ph.D. in Geosciences. The proposed program and its context at Boise State have been evaluated by an independent, external review team composed of national experts in Geosciences research and graduate education appointed by the Office of the State Board of Education (OSBE). The **Report of the External Review Committee** along with the Boise State response is included.

Monitoring and assessment of the Ph.D. in Geosciences will include periodic regional accreditation review as well as on-going internal program evaluation within the university.

Idaho State University does not offer a doctoral program in the geosciences, but the University of Idaho offers a doctoral program in geology in Moscow. The

proposed program at Boise State University is in the SBOE 8-Year Academic Plan and does not duplicate any program offered by the Idaho public system of higher education in the southwest Idaho service region.

The Chair of the Department of Geosciences at Boise State University has discussed the proposed program with his counterparts at the University of Idaho and Idaho State University, and both have indicated their support of its implementation. The geographic separation and the complementary individual strengths of the geology/geosciences departments in Idaho and surrounding states provide greater opportunities for prospective graduate students to pursue their specific interests for research specialization.

Doctoral education and research is heavily dependent on individual mentoring of students by research-active faculty advisors. Thus, adding a doctoral program in geosciences at Boise State University, with the largest pool of Geosciences faculty of any institution in the state, will significantly enhance the range of options available to students in Idaho by making available a larger group of potential faculty mentors with more diverse individual skills and research expertise. BSU also anticipates the faculty at all three Idaho universities will collaborate on research projects and serve on student doctoral committees where appropriate.

All states that border Idaho contain major universities that offer doctoral programs in various areas of the geosciences. For example, the University of Washington (Seattle), Oregon State University (Corvallis), University of Utah (Salt Lake City), and the University of Nevada (Reno) have relatively large Earth Sciences departments. However, these departments have programmatic strengths in sub disciplines such as oceanography, climatology, meteorology, geobiology, space science (planetary physics) economic geology and hydrology - areas of emphasis different from that of the proposed program at Boise State University. The largest of these departments (University of Washington) are comprehensive enough to contain faculty and research programs that overlap to some extent with the new PhD in Geosciences; however, the specific strengths are complimentary.

Idaho has a fast-growing science and technology based economic sector, currently accounting for more than 25% of the Gross State Product. The potential for economic expansion in this area is significant, however, as of the last national census in 2000, Idaho was tied for 40th place among all states with only 6.8% of its population over the age of 25 holding a graduate degree (Bauman and Graf, 2003). In 2003, Idaho ranked 43rd in the production of doctorates in sciences and engineering (Burrelli, 2004).

The needs assessment that lead to the proposal of a new PhD program in Geosciences included a synthesis of information gathered during the last three years from: (1) direct inquiries to the department and its faculty from potential students expressing their need to complete a PhD in Geosciences and desire to

do so at Boise State; (2) conversations with state and federal agency personnel in the Boise area who conduct geoscience research or evaluate geoscientific information as part of their profession; (3) discussions with research directors and program managers at the Idaho National Laboratory (INL); (4) input from private-sector companies in the Boise area that hire geoscientists; and (5) analysis of job advertisements in national publications seeking applicants with a PhD in geosciences or related disciplines. The direct student inquiries are discussed further in the next section as part of the description of likely sources of students.

Fiscal Impact

All expenditures for the new program will be supported by reallocation of existing appropriated budgets in the department and college, funding of new resources from the University growth, or by extramural funds generated via grants to geosciences faculty and the overhead generated by these grants. Existing research and academic programs will not be negatively impacted by the reallocation of resources. Increased faculty workload in Geosciences generated by the new PhD program (approximately 3.5 FTE) will be counterbalanced by the addition of four new tenure-track faculty, which will be created by restructuring salary savings gained from replacement of retiring senior faculty with new junior faculty in the college and university. Likewise, the increased demands placed on department support staff, student assistantships, and other expenses are offset by the addition of resources to the department in each of these categories derived from institutional salary savings and/or university growth.

Estimated Fiscal Impact	**FY 07**	**FY 08**	**FY 09**	**Total**
A. Expenditures				
1. Personnel	439,240	533,849	598,559	1,571,648
2. Operating	60,810	71,870	82,930	215,610
3. Capital Outlay	286,377	286,377	36,377	609,131
4. Facilities				
TOTAL:	**786,427**	**892,096**	**717,866**	**2,396,389**
B. Source of Funds				
1. Appropriated Reallocation – MCO	560,177	615,846	691,616	1,867,639
2. Appropriated – New	0	0	0	
3. Federal	215,000	265,000	15,000	495,000
4. Other (F&A return to department)	11,250	11,250	11,250	33,750
TOTAL:	**786,427**	**892,096**	**717,866**	**2,396,389**

Estimated Fiscal Impact	FY 07	FY 08	FY 09	Total
C. Nature of Funds				
1. Recurring *	560,177	615,846	691,616	1,867,639
2. Non-recurring **	226,250	276,250	26,250	528,750
TOTAL:	**786,427**	**892,096**	**717,866**	**2,396,389**

* Recurring is defined as ongoing operating budget for the program which will become part of the base.

** Non-recurring is defined as one-time funding in a fiscal year and not part of the base.

IMPACT

If Board approved, the institution will implement this program and it will be subject to future monitoring for program compliance.

STAFF COMMENTS AND RECOMMENDATIONS

BSU's request to offer a new Ph.D. program in Geosciences is consistent with their Eight-Year Plan for Delivery of Academic Programs in the Southwest Region. Board staff and CAAP recommend approval as presented.

BOARD ACTION

A motion to approve Boise State University's request to offer a Ph.D. in Geosciences.

Moved by_____ Seconded by_____ Carried Yes_____ No_____

REFERENCE: APPLICABLE STATUTE, RULE, OR POLICY

Idaho State Board of Education
GOVERNING POLICIES AND PROCEDURES
SECTION: III. POSTSECONDARY AFFAIRS
G. Program Approval and Discontinuance **October 2002**

4. Program Approval Policy

Program approval will take into consideration statewide and institutional objectives.

a. New instructional programs, instructional units, majors, minors, options, and emphases require approval prior to implementation;

(1) Board Approval – Board approval prior to implementation is required for any new:
(a) professional-technical program,
(b) academic program leading to a master's, specialist or doctoral degree,
(c) major,
(d) academic program, instructional unit, minor, option, or emphasis with a financial impact* of $250,000 or more per year

(2) Executive Director Approval – Executive Director approval prior to implementation is required for any new academic program, instructional unit, minor, option, or emphasis with a financial impact of less than $250,000 per year

b. Existing instructional programs, majors, minors, options, emphases and instructional units.

(1) Changes, additions, expansions, and consolidations to existing instructional programs, majors, minors, options, emphases, or instructional units with a financial impact of $250,000 or more per year require Board approval prior to implementation.

(2) Changes, additions, expansions, and consolidations to existing instructional programs, majors, minors, options, emphases or instructional units with a financial impact of less than $250,000 require executive director approval prior to implementation. The executive director may refer any of the requests to the Board or a subcommittee of the Board for review and action. All modifications approved by the executive director shall be reported quarterly to the Board. Non-substantive name or title changes need not be submitted for approval.

c. Routine Changes

Non-substantive name or title changes, credits, descriptions of individual courses, or other routine catalog changes do not require notification or approval.

5. Approval Procedures

a. Board Approval Procedures

(1) Subsequent to institutional review and consistent with institutional policies, all requests requiring Board approval will be submitted by the institution as a notice of intent in a manner prescribed by the Chief Academic Officer of the Board.

(2) The Chief Academic Officer shall forward the request to the CAAP for its review and recommendation. Professional-technical requests will be forwarded to the Idaho Division of Professional-Technical Education for review and recommendation prior to CAAP review and action. If the CAAP recommends approval, the proposal shall be forwarded to the Board for action. Requests that require new state appropriations will be included in the annual budget request of the institution and the State Board of Education.

(3) CAAP may, at its discretion, request a full proposal for any request requiring a notice of intent. A request for a new graduate program requires a full proposal. Full proposals should be forwarded to CAAP members at least two (2) weeks prior to the CAAP meeting.

(4) As a part of the full proposal process, all doctoral program request(s) will require an external peer review. The external peer-review panel will consist of at least two (2) members and will be selected by the Board's Chief Academic Officer and the requesting institution’s Chief Academic Officer. The review will consist of a paper and on-site review followed by the issuance of a report and recommendations by the peer-review panel. Considerable weight on the approval process will be placed upon the peer reviewer's report and recommendations.

b. Office of the State Board of Education Approval Procedures

(1) All requests requiring approval by the Executive Director will be submitted by the institution as a notice of intent in a manner prescribed by the Chief Academic Officer of the Board. At his discretion, the Chief Academic Officer shall forward the request to the CAAP for review and recommendation. Professional-technical requests will be forwarded to the Division of Professional-Technical Education for review and recommendation prior to CAAP review and action.

(2) If the CAAP recommends approval of the request(s), the notice of intent will be submitted to the Executive Director for consideration and action. The Executive Director shall act on any request within thirty (30) days of receipt of the CAAP recommendation.

(3) If the Executive Director denies the request he or she shall provide specific reasons in writing. The institution has thirty (30) days in which to address the

issue(s) for denial of the request. The Executive Director has ten (10) working days after the receipt of the institution's response to reconsider the denial. If the Executive Director decides to deny the request after re-consideration, the institution may send its request and the documents related to the denial to the president of the Board for final reconsideration.

(4) Distance Learning Delivery and Residence Centers

All academic programs delivered to sites outside of the service area defined by the institution's role and mission statement shall be submitted to the Executive Director using a notice of intent.

REFERENCE: APPLICABLE STATUTE, RULE, OR POLICY

TITLE 33
EDUCATION
CHAPTER 1
STATE BOARD OF EDUCATION

33-107. GENERAL POWERS AND DUTIES OF THE STATE BOARD. The state board shall have power to:

(7) prescribe the courses and programs of study to be offered at the public institutions of higher education, after consultation with the presidents of the affected institutions;

TITLE 33
EDUCATION
CHAPTER 40
BOISE STATE UNIVERSITY

33-4001. BOISE STATE UNIVERSITY ESTABLISHED -- STANDARDS -- PROFESSIONAL-TECHNICAL PROGRAMS. The college now known as Boise state college and previously operated and conducted by Boise community college district in Ada County, Idaho, known as Boise college, shall be established in the city of Boise, Idaho, as an institution of higher education of the state of Idaho, for the purpose of giving instruction in college courses in sciences, arts and literature, professional, technical and other courses of higher education, such courses being those that are usually included in colleges and universities leading to the granting of appropriate collegiate degrees, said college to be known as Boise State University. The standards of the courses and departments maintained in said university shall be at least equal to, or on a parity with those maintained in other similar colleges and universities in Idaho and other states. All programs in the professional-technical departments, including terminal programs now established and maintained, may be continued and such additional professional-technical and terminal programs may be added as the needs of the students attending such university taking professional-technical and terminal programs shall warrant, and the appropriate certificate for completion thereof shall be granted. The courses offered and degrees granted at said university shall be determined by the board of trustees.

IDAHO STATE BOARD OF EDUCATION

ACADEMIC/PROFESSIONAL-TECHNICAL EDUCATION

FULL PROPOSAL

to initiate a

NEW, EXPANDED, COOPERATIVE, DISCONTINUED, PROGRAM COMPONENT OR OFF-CAMPUS INSTRUCTIONAL PROGRAM OR ADMINISTRATIVE/RESEARCH UNIT

Submitted by:

Boise State University

Institution Submitting Proposal

College of Arts & Sciences

Name of College, School, or Division

Geosciences

Name of Department(s) or Area(s)

A New, Expanded, Cooperative, Contract, or Off-Campus Instructional Program Leading to:

Doctor of Philosophy in Geosciences (CIP 40 0601)

Degree/Certificate & 2000 CIP

Program Change, Off-Campus Component

Fall 2006

Proposed Starting Date

This proposal has been approved by:

Stacy Pearson 1/3/06

Chief Fiscal Officer (Institution) Date

SBOE/OSBE Approval Date

Mary L. Andrus 1/3/06

Chief Academic Officer (Institution) Date

1/3/06

President Date

EXECUTIVE SUMMARY

PROGRAM DESCRIPTION:
Boise State University proposes to deliver a new PhD program in Geosciences beginning with the Fall 2006 semester. The program is listed in the SBOE approved 8-year Academic Plan. This program will give students, local industry, and state and federal agencies in southwest Idaho access to a research-intensive program with strengths in geology/geochemistry and surficial processes/geomorphology. The program will require 66 credits of academic coursework beyond the Bachelor's Degree and follow all policies and procedures of the Graduate College.

STRENGTHS:
The proposed program builds on a strong foundation of existing graduate coursework and experience within the Department of Geosciences in managing successful graduate programs at both the MS and PhD levels. Boise State has a nationally recognized Geosciences faculty of sufficient size to support a quality PhD program (currently 12 tenure track faculty, building to 16 as of Fall 07), and it has existing and planned research infrastructure unique to the state and region. Examples include the Thermal Ionization Mass Spectrometry (TIMS) laboratory funded by the National Science Foundation, the Water and Soil Chemistry Laboratory funded by NSF-EPSCoR, the Boise Hydrogeophysical Research Site (BHRS) funded by the Army Research Office and EPA, and the Stable Isotope Geochemistry Laboratory planned for the 06-07 academic year.

CURRENT ACCESS:
During the five-year interval from 1999 – 2003, Idaho produced an annual average of only 2 PhD Geoscientists, fewest among all states in the Northwest region (ID, OR, WA, MT, UT, NV, MT) except Montana. One contributing factor is that Idaho has only one PhD program in Geology/Geosciences (offered by the University of Idaho through the main campus in Moscow), and no PhD program is available in the southwest region, where much of the state population, industry, and government agencies that rely on geosciences are located. The proposed program at Boise State University does not duplicate the program at the University of Idaho, but rather adds to the specializations available within the state.

SBOE EXTERNAL EVALUATION COMMITTEE:

The Following statements come from the report of the External Evaluation Committee and summarize their view of the proposed PhD in Geosciences:

"The External Program Review Team (EPRT) strongly endorses the proposed Ph D. in Geosciences as described in the draft Program Proposal. The EPRT further recommends to BSU that the program plan be submitted to the Idaho Board of Education for consideration as soon as possible to allow students to be recruited and admitted to BSU beginning in the Fall 2006. We believe that the Geosciences Department and BSU is well positioned and prepared to implement this degree program immediately"

"The Geosciences faculty members are nationally recognized for their research in the three principal focus areas of the department. ...We note that the Geosciences Department has already successfully developed and implemented a doctoral program in Geophysics, and we are confident that the Department is both prepared and correctly positioned to expand their offerings at the doctoral level. "

"The proposal has more than adequately demonstrated the need for graduate-level geoscientists in Idaho and the region. The development of this doctoral program at BSU is directly coincident with the University's strategic goals of advancing the sciences and engineering for the fast-growing Boise area."

"The proposed doctoral program does not duplicate existing programs, but rather adds to the diversity of offerings within the Idaho system of higher education. The proposed doctoral program will foster additional cooperation and collaboration within the Idaho system and across the region. "

"With the addition of a doctoral degree program, we are confident that the BSU Geosciences Department will become a regional, and potentially national, leader in geoscience research. "

1. NATURE OF THE REQUEST

Describe the nature of the request. For example, is this a request for a new on-campus program? Is this request for the expansion or extension of an existing program, or a new cooperative effort with another institution or business/industry or a contracted program costing greater than $150,000 per year? Is this program to be delivered off-campus or at a new branch campus? Attach any formal agreements established for cooperative efforts, including those with contracting party(ies). Is this request a substantive change as defined by the NWASC criteria?

Boise State University proposes a new on-campus doctoral program requiring 66 credits (including a dissertation) and leading to the degree of Doctor of Philosophy (Ph.D.) in Geosciences. The proposed program builds on faculty research strengths in geology, hydrology, and geochemistry from across the university and is complementary to the existing doctoral program in geophysics. Faculty participants will work together on student recruitment, admissions decisions, assignment of supervisory committees, design of comprehensive examinations, and the generation of financial support and research opportunities for students.

2. QUALITY

This section must clearly describe how this institution will ensure a high quality program. It is significant that the accrediting agencies and learned societies which would be concerned with the particular program herein proposed be named. Provide the basic criteria for accreditation and how your program has been developed in accordance with these criteria. Attach a copy of the current accreditation standards published by the accrediting agency.

Further, if this new program is a doctoral, professional, or research, it must have been reviewed by an external peer-review panel (see page 7, "Guidelines for Program Review and Approval). A copy of their report/recommendations must be attached.

Boise State is committed to excellence in the delivery of all its educational programs, including the growing suite of targeted PhD programs. A number of programmatic controls and quality assurance activities are part of the management plan for the anticipated PhD in Geosciences. These are highlighted and described in more detail below. The proposed program and its context at Boise State have been evaluated by an independent, external review team composed of national experts in Geosciences research and graduate education appointed by the SBOE. The **Report of the External Review Committee** along with the Boise State response is included in **Appendix A.**

<u>Accreditation and Program Review:</u> Long-term maintenance of quality in an educational program requires an effective, on-going process of assessment and evaluation to track progress and guide the management of the program. Monitoring and assessment of the PhD in Geosciences will include periodic regional accreditation review as well as on-going internal program evaluation within the university.

Regional Institutional Accreditation: Boise State University is regionally accredited by the Northwest Commission on Colleges and Universities (NWCCU). Regional accreditation of the university has been continuous since initial accreditation was conferred in 1941. Boise State University is currently accredited at all degree levels (A, B, M, D).

Specialized Accreditation: There is no specialized accreditation appropriate to the proposed program.

Internal Program Evaluations: Internal program evaluations will take place every five years as part of the normal departmental review process conducted by the Office of the Provost. This process requires a detailed self study (including outcome assessments) and a comprehensive review and site visit by external evaluators.

<u>University and Graduate College Oversight:</u> The program will adhere to all policies and procedures of the Graduate College which is assigned broad institutional oversight of all graduate degree and certificate programs. The university will invest resources sufficient to (1) maintain a nationally recognized geosciences faculty, (2) develop new campus and field laboratory and instrumentation infrastructure (as appropriate) to

conduct leading geoscientific research, and (3) help to recruit top-quality students from local, national, and international sources.

Geosciences Departmental Oversight: The proposed new PhD in Geosciences will build on a significant foundation of experience within the department of managing graduate programs successfully. Existing graduate programs include MS degrees in Geophysics, Geology, and Earth Science, and a PhD in Geophysics. The graduate student community of the department currently includes about 20 MS students and 8 PhD students. The majority of MS students graduate 2-3 years after initial matriculation, and the first cohort of Geophysics doctoral students will graduate in May, 2006. Thus, the Department of Geosciences has the organizational structures, policies and procedures already in place to manage graduate programs successfully and to ensure that students receive the individual mentoring, guidance, and professional development needed to progress through their programs in a timely manner.

Existing graduate and undergraduate programs in the department will receive collateral benefits from the addition of the proposed new PhD program, helping them to become even stronger. The presence of advanced graduate students and their dissertation research in the department creates an environment that fosters student-to-student mentoring and creates more opportunities for hands-on participation (particularly of undergraduates) in advanced, applied research. We have seen this outcome in the last few years as a byproduct of our existing PhD in Geophysics, and it is consistent with national studies of the potential benefits of research intensive graduate programs on undergraduate education (e.g., Boyer Commission on Educating Undergraduates, 1998; NRC Committee on Undergraduate Science Education, 1999). Aspects of departmental management plans for the new PhD program are described below.

Student Mentoring and Program Assessment: On-going program evaluation and assessment at the department level will provide essential information to help ensure the long-term quality of the program. Assessment activities will allow monitoring of individual student progress in the program so challenges can be recognized early and managed effectively. Integrated and evaluated over time, this feedback can also be used to fine-tune and adjust the overall program design, as needed to maintain excellence. Components of the student mentoring and outcomes assessment plan include:

- *Appointment of a Major Advisor who has the primary responsibility for day-to-day mentoring and professional development of their students* – Identification of the advisor is a prerequisite for admission to the program.
- *Required registration of all new graduate students in GEOL 601 Graduate Orientation* – This class is designed to facilitate the transition of students into the department, help them understand the processes and procedures associated with completion of a degree, and to begin composing a dissertation proposal.
- *Planning of academic course work* – Students work with their advisor to complete a Program Development Form (PDF), which identifies the calendar of course work necessary for students to complete their degree requirements. Each student's PDF is up-dated on an annual basis, providing an opportunity for the advisor and student to review the plan and make corrections, additions, etc., as necessary. Completed PDFs are placed in each student's departmental file.
- *Evaluation of the dissertation proposal* – Students must submit to their Supervisory Committee a dissertation proposal describing in sufficient detail the proposed scope of work, anticipated scientific impact, timeline, and a plan for obtaining and utilizing the resources necessary to complete the research. A complete draft of the thesis proposal must be submitted by the end of the second semester. The draft proposal is evaluated by the committee and returned to the student with comments and suggestions for revision (if necessary). A final dissertation proposal must be submitted prior to the Comprehensive Examination, and the proposal becomes part of the material discussed and evaluated in the oral portion of the Comprehensive Examination. A copy of the dissertation proposal and the committee's evaluation/comments is placed in the student's departmental file.
- *Progress and competency in graded coursework* – How students perform in the classroom will provide a direct metric of progress and achievement – particularly in the early portion of the program when much of the required course work is typically taken by students.

- *The Comprehensive Examination* - As discussed below, the exam represents a significant milestone and an important assessment tool for monitoring how well students have assimilated information from various sources and integrated it into a comprehensive knowledge of Geosciences.
- *Annual meeting with Supervisory Committee and progress report* - Although students will interact with members of their Supervisory Committee individually and informally on a daily or weekly basis in classes or working on their research, the entire Supervisory Committee will meet formally with a student at least once a year to receive a progress report from the student, provide feedback, and discuss future plans. Notes from the meeting and the progress report of the student become part of the student's departmental file.
- *Graduate Student presentation seminar* – Each year, as part of the departmental student seminar series, all graduate students are required to give a 15-minute oral presentation (with PowerPoint slides) about their thesis/dissertation research. The audience consists primarily of the faculty and students of the department, but also commonly includes other interested people from the community or other departments. The length, style, and format of the talk are consistent with the requirements of presentations at national professional conferences in Geosciences.
- *Dissertation defense* – the culminating activity of the program is the oral presentation and public defense of the dissertation (discussed in more detail below).
- *Exit interview* – Following completion of the degree, as students transition out of the department, we will conduct an exit interview to evaluate their experiences in the program, determine if their expectations were met, and obtain specific suggestions for ways to improve the program.
- *2-year post-graduation follow-up interview with alumni* – The department will contact and interview alumni approximately 2 years after graduation to assess whether or not the program was effective in giving the students the practical skills and knowledge necessary to achieve success in the 'real world.' Feedback from the alumni will be factored into decisions about restructuring of coursework or other aspects of the program (as needed).

To ensure that program monitoring and outcomes assessment are conducted fairly, effectively and consistently, the Department of Geosciences is establishing an Education Program Director staff position beginning January, 2006, with a core responsibility of organizing and implementing substantive assessment plans for all degree programs in the department, including the new PhD.

Graduate Program Committee: The Graduate Program Committee (GPC) of the Department of Geosciences consists of the graduate program coordinators for each of the graduate programs in the department, plus the chair of the Department. The duties of the Graduate Program Committee include development of recommendations for admission of prospective graduate students, decisions on transfer credits and required background courses, decisions on the award of departmental graduate fellowships and assistantships, and appointment of Supervisory Committees for graduate students.

Supervisory Committee: The Supervisory Committee is charged with general guidance of the doctoral student, including design and approval of the program of study, administration of the comprehensive examination, supervision of the dissertation research, and participation in the dissertation defense. The Supervisory Committee consists of a major advisor who acts as chair, and at least two additional members, all of whom must be members of the University regular or research faculty and must also be members of the Graduate Faculty. Up to two additional members may be appointed when such appointments enhance the function of the Committee. In all cases, regular or research faculty members of the Department of Geosciences must constitute a majority of the Supervisory Committee. Students are encouraged to have at least one member of their committee who is external to the Department of Geosciences.

Application and Admission Requirements: Applicants to the PhD program in Geosciences will be required to have a Bachelor's or Master's degree in a geosciences or a related discipline from an accredited college or university. Admission will be competitive and will be based on transcripts, professional references, scores on the general test of the Graduate Record Examination (GRE), and evaluation of a letter of intent describing previous research experience and the applicant's professional

interests and plans for the future. Students whose native language is not English must submit a TOEFL score of 587 or higher for the written exam and 240 or higher for the computer-based examination.

a. Curriculum

Describe the listing of new course(s), current course(s), credit hours per semester, and total credits to be included in the proposed program.

The curriculum design is consistent with the nominal requirements found in the broad spectrum of geosciences programs at the doctoral level in the United States. Table 1 shows the requirements of the proposed program, followed by more detailed descriptions of non-credit requirements like the comprehensive examination and dissertation defense. This information will be included, as it appears below, in the Graduate Catalog description of the program.

Table 1: Degree Requirements

Doctor of Philosophy in Geosciences	
Course Number and Title	**Credits**
Geosciences courses (GEOG, GEOL, or GEOPH) approved by the supervisory committee and by the coordinator of the geosciences doctoral program	32
Additional elective courses in geosciences or related fields as approved by the supervisory committee and by the coordinator of the geosciences doctoral program	16
Subtotal	**48**
GEOL 693 Dissertation (Pass/Fail)	18
TOTAL	**66**

Credit Requirements: Courses applied to meet the 66-credit minimum requirement must be taken for a letter grade (A-F), except that GEOL 693 Dissertation will initially be graded IP (In Progress) and later graded P (Pass) or F (Fail) depending on the outcome of the dissertation defense. All Geosciences electives must be graduate courses in geology (GEOL), geography (GEOG), or geophysics (GEOPH), with at least 12 credits at the 600 level. On-campus graduate students are required to enroll for GEOL 598 Graduate Seminar each and every semester it is offered but GEOL 598 may not be applied to meet the Geosciences elective requirement. With GPC approval, applicants admitted with an MS degree in Geosciences or related discipline from an accredited college or university may transfer up to 22 credits of previous graduate course work toward the required credit total.

Comprehensive Examination: The objective of the comprehensive examination is to judge depth and breadth of knowledge in Geosciences. The examination is to be developed and administered by the Supervisory Committee. A student must take the comprehensive examination prior to the end of their fourth semester. The outcome of the examination is determined by the Supervisory Committee and must be one of the following: pass or fail. If a student fails the initial examination, the committee has the option of allowing a student to repeat the examination one time. If a repeat examination is granted by the Supervisory Committee, it must occur within 3 months of the initial examination. Failure of the Comprehensive Examination results in dismissal from the Ph.D. program.

Teaching Requirement: Working with a faculty mentor, all students in the PhD program are required to develop and deliver as the principal instructor one 3-credit course at the undergraduate level. The

Teaching Requirement will usually be met in the later part of their program, following the Comprehensive Examination and prior to Dissertation Defense.

Dissertation Requirements: The dissertation must be the result of independent and original research by the student and must constitute a significant contribution to geoscientific knowledge equivalent to multiple peer-reviewed publications. The style and format of the dissertation are to conform to the standards of the Department of Geosciences and the Graduate College.

Dissertation Defense: A public defense of the dissertation is scheduled after the Supervisory Committee has reviewed a draft that is considered to be nearly a final version. The date of the defense is determined jointly by the Supervisory Committee and the student and must be consistent with any guidelines provided by the Graduate College. A defense Committee is formed that consists of the following voting members: an appointed chair, the chair and members of the Supervisory Committee, and an external examiner. The chair of the Defense Committee is appointed by the Dean of the Graduate College and must be a regular member of the Graduate Faculty, but must not be the chair of the Supervisory Committee. The external examiner is a faculty member from another university who is a recognized expert in the field of the dissertation research and is appointed to the Defense Committee by the Dean of the Graduate College. Attendance at the defense by the external examiner is not required, but a written evaluation of the dissertation and a pass or fail vote must be submitted by the external examiner to the chair of the Defense Committee at least 3 weeks prior to the defense. The written evaluation provided by the external examiner is distributed to the other members of the Defense Committee at least 2 weeks before the defense. The chair of the Defense Committee conducts the defense according to the procedure established for the Department of Geosciences by the Graduate Program Committee. A majority vote is used to decide the outcome (pass or fail). In the event of a split vote, the Dean of the Graduate College will also cast a vote after consultation with the defense chair and the Supervisory Committee. A student who fails the defense may be permitted to try again but failure a second time will result in dismissal from the program.

Final Approval of the Dissertation: If the defense is completed with a result of pass, the Supervisory Committee prepares a statement describing final requirements such as additions or modifications to the dissertation and any additional requirements such as archival of data. When these requirements have been met to the satisfaction of the Supervisory Committee, the approval page of the dissertation is signed by the members of the Committee.

Graduate Geosciences Courses: Catalog Descriptions of existing graduate classes offered through the Department of Geosciences are given in **Appendix B.** In addition, the graduate curriculum will be augmented by the addition of four new tenure-track faculty members, two beginning with the Fall 2006 semester, and two with the Fall 2007 semester. The new faculty members will develop new graduate courses in the areas of their specialization, and contribute to the delivery of the undergraduate curriculum as appropriate.

b. Faculty

Include the names of full-time faculty as well as adjunct/affiliate faculty involved in the program. Also, give the names, highest degree, rank and specialty. In addition, indicate what percent of an FTE position each faculty will be assigned to the program. Are new faculty required? If so, explain the rationale including qualifications.

The Department of Geosciences currently includes 12 full-time Tenure-Track Faculty, 7 Research Faculty, and 9 Adjunct and/or part-time faculty (Table 2). In addition, two new tenure-track faculty members will join the department beginning with the Fall, 2006 semester, and two more will begin Fall 07. Curriculum Vitae for Geosciences Tenure-Track faculty are included in **Appendix C.** Program specific FTE shown for each faculty member is an estimate for a typical year and is based on current departmental assignments; FTE distribution will likely evolve based on the ebb and flow of each faculty member's research funding, commitments to other graduate and undergraduate programs, administrative assignments, professional or institutional service commitments, etc.

Table 2: Faculty involved in the program

Faculty	Degree	Rank	Specialty	Program FTE
Department of Geosciences Tenure-Track (16 Faculty by Fall 07)				
S. Benner	PhD	Assistant Professor	Aqueous & Environmental Geochemistry	0.33
J. Bradford	PhD	Assistant Professor	Geophysics	0.11
J. McNamara	PhD	Associate Professor	Surface water Hydrology	0.33
P. Michaels	PhD	Associate Professor	Geophysics	0.11
C. Northrup	PhD	Associate Professor	Structural Geology & Tectonics	0.22
P. Routh	PhD	Assistant Professor	Geophysics	0.11
J. Pelton	PhD	Professor	Geophysics, Graduate Dean	0.05
J. Pierce	PhD	Assistant Professor	Geomorphology & Environmental Geology	0.33
M. Schmitz	PhD	Assistant Professor	Isotope Geochemistry & Geochronology	0.33
W. Snyder	PhD	Professor	Stratigraphy, Sedimentation & Tectonics	0.22
C. White	PhD	Professor	Igneous Petrology and Volcanology	0.22
D. Wilkins	PhD	Assistant Professor	Surficial Processes	0.33
K. van Wijk (Fall 06)	PhD	Assistant Professor	Geophysics	0.11
New Faculty (Fall 06)	PhD	Assistant Professor	Stable Isotope Geochemistry	0.33
New Faculty (Fall 07)	PhD	Assistant Professor	to be determined	0.33
New Faculty (Fall 07)	PhD	Associate Professor	Geophysics	0.11
Department of Geosciences Research (7 Faculty)				
W. Barrash	PhD	Research Professor	Groundwater Hydrology	
B. Clement	PhD	Research Asst. Prof.	Geophysics	
T. Clemo	PhD	Research Asst. Prof.	Geophysics	
V. Davydov	PhD	Research Professor	Paleontology and Biostratigraphy	
M Knoll	PhD	Research Professor	Geophysics	
M Lyle	PhD	Research Professor	Oceanography and Paleoclimatology	
K. Viskupic	PhD	Research Asst. Prof.	Petrology and Tectonics, community outreach	
Department of Geosciences Adjunct and Part-Time (9 Faculty)				
C. Adams	MS	part-time adjunct	Geographic Information Systems instructor	
R. Frank	MS	part-time adjunct	Geology Instructor, west campus	
V. Gillerman	PhD	part-time adjunct	Idaho Geological Survey co-located personnel	
J. Hadden	BS	adjunct	introductory laboratory coordinator	
D. Matthews	MS	adjunct	Geography instructor	
J. Parker	MS	adjunct	Geography instructor	
W. Robertson	MS	part-time adjunct	Geographic Information Systems instructor	
M. Stocklosa	PhD	adjunct	Introductory Geology Instructor	
J. Zollweg	MS	part-time adjunct	Introductory Geology Instructor, extended studies	
Other Affiliated Faculty		***(Department)***		
K. Ferris	PhD	Dept of Biology	Groundwater & microbiology	
M. Gribb	PhD	Dept of Civil Engineering	hydrology & geo-environmental engineering	
C. Hill	PhD	Dept of Anthropology	Cenozoic paleobiology and paleontology	
L. Qu	PhD	Dept of Mathematics	statistics	
J. Mead	PhD	Dept of Mathematics	computational partial differential equations	
G. Murgel	PhD	Dept of Civil Engineering	environmental and water resource engineering	
New Faculty (Fall 06)	PhD	Dept of Civil Engineering	hydrology & geo-environmental engineering	

As with the current academic programs offered in the Department of Geosciences, the research efforts and classroom instruction of the tenure-track faculty in the department will form the direct foundation for the new PhD program. The PhD curriculum builds naturally on the suite of classes in Geography, Geology, and Geophysics already offered through the department. New tenure-track faculty, and a full-time Lecturer position focused on introductory undergraduate class delivery, will be added to the department in the next two years. These additions will allow the department to enhance graduate education and research while maintaining the quality of its undergraduate degree programs. Teaching by the adjunct faculty contributes

indirectly but importantly to the success of the existing graduate programs by covering a portion of the extended undergraduate curriculum with talented local professionals, allowing a broader suite of graduate courses to be developed and offered by the tenure-track faculty.

Research Faculty may provide topical courses in areas of their specialization at either the graduate or advanced undergraduate level by appointment to the Adjunct Faculty, and will serve on Supervisory Committees as need or interest arises. Research Faculty also play an important role by generating a larger, more dynamic and diverse research environment within the department. Extramural funding obtained by the Research Faculty also helps to build and maintain the overall research infrastructure of the department and may support directly the dissertation research of some students. Useful supplementary course work in other disciplines (Math, Biology, Civil Engineering, etc.) is available through existing graduate programs in other departments and taught by tenure-track faculty in those departments.

With faculty additions to be completed in Fall 07, the Department of Geosciences at Boise State will be at or above the average size of PhD granting geoscience departments regionally (figure 1). This solid foundation of faculty will help to ensure the on-going strength and excellence of the new PhD program.

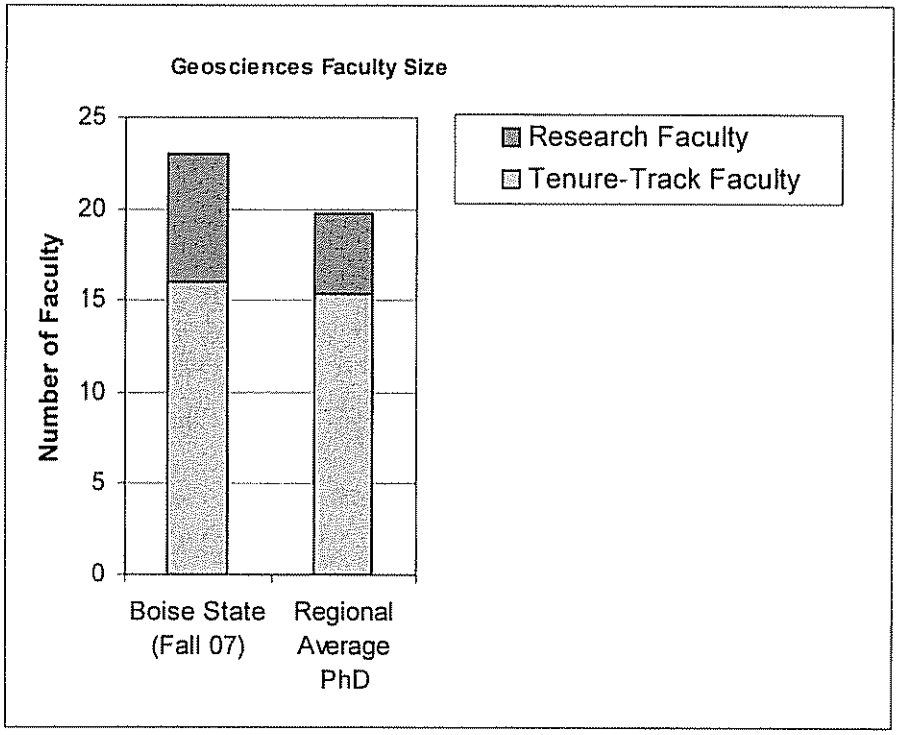

Figure 1: Comparison of the Boise State Tenure-Track and Research Faculty size with the average of PhD granting geoscience departments in the Northwest region (ID-WA-OR-MT-NV-UT-WY). Data are from information posted on department web pages as of November 2005 (Appendix D).

c. Students

Briefly describe the students who would be matriculating into this program.

This program will attract students from the state and region as well as from across the nation and other countries. Applicants will have Bachelor's and/or Master's degrees in geosciences or a related discipline. They will typically plan to establish careers in basic or applied geoscience research, natural resource management, or in private industry or government agencies that rely on the generation and analysis of information about geologic, hydrologic, or environmental processes.

d. Infrastructure Support

Clearly document the staff support, teaching assistance, graduate students, library, equipment and instruments employed to ensure program success.

Academic and Research Support Staff: The Department of Geosciences has a number of full-time and part-time staff, providing excellent service and support for the faculty, students, and programs of the department. Addition of the new PhD program will increase the demands placed on the staff, and the management plan for the new PhD program includes targeted staff augmentation to ensure continued quality of support. Details of the current staff structure and planned additions are discussed more completely in section 6.

Library Facilities: The current library facilities are sufficient to initiate the new graduate program, but may need to be augmented over time to include more electronic journal subscriptions and an increased spectrum of journal availability. These upgrades are part of the planned growth of the Library facilities and are needed to support a wide range of new research and graduate academic programs. The current monograph budget for Geosciences is $14,015. The serials budget is $96,219. The members of the faculty also have access to many additional serials titles through packages such as Elsevier ScienceDirect, Springer/Kluwer, and Wiley. In addition, the library is a U.S. Geological Survey repository, so the complete suite of USGS maps and publications is available on-campus.

Collection Statistics:

Books	530,148
Bound Periodicals	85,263
Current Periodicals, Newspapers & Other Serials	6,493
Total periodicals, newspapers, and serials available - all sources	23,195
Online Databases	13
Microforms	1,486,514
Non-print Materials	60,586
Maps	99,781
Manuscripts (linear feet)	5,582
U.S. Documents	97,471
Textbooks, Company Reports, Computer Software, Browsing Books	25,214

Facilities

Net Assignable Square Feet (estimate)	200,000
Seats	1,312
Public Terminals	70

Staff

Librarians	15.92 (FTE)
Professional Staff	3.88 (FTE)
Other Staff	47.15 (FTE)
Student Assistants in 60-70 student positions	14.43 (FTE)
Total Staff	81.38 (FTE)

Geosciences information systems and search engines

Web of Science
GeoRef
GEOBASE

Laboratories, Equipment, and Instrumentation: As described individually below, the Department of Geosciences currently houses a number of research laboratories that will form the analytical foundation of the PhD program, and more are currently under construction or planned for the near future.

Isotope Geochemistry & Geochronology Clean laboratory: A 750 square foot clean laboratory for ultra-clean chemical preparation of geological materials for isotope geochemical analysis is currently under construction. This laboratory incorporates design principles successfully used in clean lab facilities operating at the Massachusetts Institute of Technology and the Carnegie Institution of Washington. The facility consists of a suite of four interconnected laboratories with a dedicated air handling system to provide climate controlled, cascading positive-pressure HEPA-filtered conditions. Two wet chemical labs include: 1) a dedicated interior laboratory for ultra-low blank U-Th-Pb chemistry under two six-foot, Class 10 vertical laminar hoods; 2) a general chemistry laboratory with two six-foot, Class 10 horizontal acid hoods and dedicated exhausted bench work spaces for radiogenic isotope sample dissolution and chemical separation, including the Rb-Sr, Sm-Nd, Lu-Hf and U-Th-Pb systems in rock, mineral and water matrices.

Support equipment in the laboratories include a dedicated Millipore Elix/Milli-Q ultra-clean water system, quartz and teflon PFA sub-boiling distillation units for ultra-clean reagent preparation, laboratory balances, zoom binocular microscopes, high-speed centrifuge, hot plates for low-pressure rock digestion, and a variety of teflon PFA ion chromatographic supports. A supporting laboratory external to the clean lab suite houses a muffle furnace, and gravity ovens for high-pressure rock and mineral dissolution using Parr acid digestion vessels.

Mass Spectrometry Facility: A temperature (± 1°C) and humidity (30-60%) controlled, HEPA filtered, positive pressure room has been designed to house future mass spectrometry equipment (thermal ionization mass spectrometer). Control of the instrument will be maintained remotely in an adjoining laboratory which also serves as a mineral picking lab and anteroom to the wet chemistry clean laboratories.

Rock Geochemistry and Mineral Separations Facility: The Department of Geosciences maintains three laboratories for rock sample preparation and mineral separations: 1) a full rock cutting facility including a variety of diamond saws, a thin section cut-off saw, grinding wheels, and impregnation equipment for thin section and mineral mount preparation; 2) a full rock crushing, powdering and first-stage mineral separation facility including a large and small Bico jaw crushers, a Bico rotary disc mill, shaker sieves, and Rogers water table for mineral separation; and a Spex ball mill and Shatterbox with alumina grinding vessels for geochemical powder preparation; 3) a combined acid dissolution lab with exhausted fume hood for biogenic phosphate separation, and second stage mineral separations facility, including a Frantz Isodynamic Magnetic Barrier separator, exhausted fume hood for heavy liquids separation, and a specially-designed high-power ultrasonication and two-stage vortical washing device for the separation of heavy minerals from clay-rich volcanic tuff samples.

Paleontology-Biostratigraphy Laboratory: The distributed facilities for paleontology-biostratigraphy provide for the complete study and storage of paleontologic and sedimentary samples. These facilities include: 1) a 350 square foot acid dissolution laboratory for the extraction of microfossils, 2) an 1100 square foot building that includes full rock cutting facility including a variety of diamond saws, a thin section cut-off saw, grinding wheels, and impregnation equipment for thin section and microfossil mount preparation, and storage for specimens (shared facility, includes equipment for Rock Geochemistry and Mineral Separations), and 4) a 300 square foot area for specimen examination and storage.

Geospatial Research Facility: The Geospatial Research Facility (GRF) is housed in 1400 square feet, equally divided between a short course/teaching and research areas. This facility houses the computer servers for the GRF and the department. Four workstations are available for use in GIS-related research. The short course area is capable of housing sixteen computers for instruction which also serve as stations for student projects and research. Equipment includes a 36" HP plotter and several printers.

Dry Creek Experimental Watershed: The Dry Creek Experimental Watershed drains 27 km2 in the foothills adjacent to Boise, Idaho and has been the site of extensive hydrologic research since 1998. The instrumentation network placed throughout the watershed is designed monitor the major components of the hydrologic to serve as a test site for evaluating hydrologic models, conducting intensive hydrologic

process studies, and serving as an outdoor laboratory for students. Long-term instrumentation includes seven stream gauging stations composed of Druck pressure transducers and Campbell Scientific dataloggers, two weather stations that record precipitation, snow depth, solar radiation, wind speed, wind direction, soil temperature, soil moisture, and overland flow. A smaller sub-watershed (0.02 km2), called the Treeline Watershed, contains an array of soil moisture and tension sensors to investigate hydrologic pathways through hillslopes to streams. Portable field hydrologic equipment to support include InSitu tension disk infiltrometers, a Sontek sonic velocity meter, soil sampling equipment, a Topcon total station, three ISCO automatic samplers, manual and electronic soil moisture sampling instruments, a Chevrolet S-10 truck, and miscellaneous field supplies.

Boise Hydrogeophysical Research Site (BHRS): The BHRS is a currently existing field-scale research wellfield developed with funding initially from the Army Research Office and subsequently from EPA as a 3-D control volume and test cell to support development of methods for accurately estimating 3-D heterogeneous distributions of hydraulic conductivity in shallow alluvial aquifers by supplementing hydrologic data with geophysical data. The BHRS is located on a gravel bar at a natural area adjacent to the Boise River 15 km from BSU and downtown Boise, Idaho. The alluvial aquifer at the BHRS is shallow and unconfined. There is no nearby development to interfere with hydrologic or geophysical experiments, and management of the Boise River provides a constant head boundary at two different levels (winter in-stream flow and summer irrigation supply). Instrumentation at the BHRS includes 18 wells that were cored through 18-21m of coarse unconsolidated braided-stream deposits and completed into the underlying tight red clay; 13 wells are concentrated in the 20m x 20m x 20m central testing area of the BHRS, and five wells are "boundary" wells. All wells are 10-cm-ID PVC, are fully screened through the alluvial aquifer, and have HDPE surface casing (no metal to interfere with geophysical tests). The 13 central area wells are arranged in two concentric six-well rings around a central well to provide local well density for 1D single-well tests and logging, numerous well-pair transects for 2D crosshole tomography and tracer tests, and overlapping volumes for 3D multiwell-multilevel hydrologic, geophysical and tracer tests. The subsurface sedimentary deposits exhibit three scales of heterogeneity in the aquifer including both layered and patchy, or lensey, sedimentary zonation which are recognizable with a variety of hydrologic and geophysical methods. State-of-the-art equipment at BSU is available for borehole, crosshole, and surface geophysics including modular equipment for single-well and multiwell-multizone hydrologic, geophysical and tracer testing. A wide variety of hydrologic and geophysical surveys have been conducted at the site including a 17-day tracer/time-lapse imaging test.

Hydrologic Equipment: Hydrologic testing systems including: Two Campbell Scientific PST/8 systems with pressure transducers and high-speed recording for simultaneous measurements in up to 8 wells each; FISO fiber-optic transducers and associated light conditioners, electronics and software for multiwell, multizone pressure measurements and high-speed recording; in-well In-Situ transducers with loggers - two for water pressure, one for atmospheric pressure; modular straddle-packer system for pumping or injecting from isolated zones of variable thickness down to <1m and with dedicated transducers for in- and below-zone high-speed pressure measurements; system with custom strain-gauge transducers and Campbell Scientific logger for pressure measurements in 7 isolated zones per well; pumps for flowrate ranges <1 gpm to 50 gpm from shallow aquifer; analog and digital flowmeters; Solinst modular packer, port, spacer, and manifold components for simultaneously measuring pressure and/or sampling water from multiple zones isolated in multiple wells; custom packer and port systems for isolating 6 x 1-m zones outside a 2-inch riser for pressure and/or chemistry sampling simultaneously with geophysical logging tests (e.g., radar tomography, borehole geophysical logging,...); tracer test equipment for field sampling and field or laboratory analysis with Turner fluorometer, and conductivity and bromide probes; multifunction water chemistry sonde for in-well logging or measurements with a flowthrough cell.

Water and Soil Chemistry Laboratory (opening in 2006): The Water and Soil Chemistry Laboratory provides sample preparation and analysis capabilities for a suite of environmental chemistry parameters to characterize solid and aqueous samples. The facility is divided into a sample preparation laboratory equipped with acid resistant fume hoods, sinks and chemical storage and a temperature (± 1°C) and humidity (30-60%) controlled analytical facility. Sample preparation equipment includes high precision

balances, Marathon 21000R 8 place rotor centrifuge, Marathon 16KM microcentrifuge laboratory oven, muffle furnace, Millipore Elix/Milli-Q ultra-clean water system, -20oC and 4oC sample storage. Instrumentation includes a Thermo Intrepid Inductively Coupled Plasma Spectrometer, Dionix Ion Chromatograph, Lachat QuikChem 8500 Series FIA+, LECO TruSpec CN Elemental Determinator, and a Thermo Spectronic AquaMate Spectophotometer.

Computing capabilities: In-house computing capabilities include networked UNIX (including multiprocessor Silicon Graphics) and Linux workstations, and Apple and IBM-compatible PCs; numerous and various printing, plotting, scanning and media peripherals; and massive disk storage. Software includes geophysical processing software (e.g., ProMAX seismic processing and Landmark seismic interpretation, Schlumberger GeoFrame multisurvey integrated 2D/3D seismic interpretation package, SeisUNIX, GM-SYS for interactive gravity and magnetic modeling,...). Researchers have ready access to support software such as numerous language compilers and MATLAB, RayInvr, as well as Techplot, RockWare, Surfer/Grapher, statistical and geostatistcal and hydrologic software, GMS and the full suite of flow and transport models included with GMS, and UCODE and PEST inverse codes (as well as customized open-source and in-house geostatistical, forward, and inverse codes). A full complement of GIS and remotely-sensed image-processing software is available in the department (see Geospatial Research Facility). Parallel computing is available with a campus Beowulf cluster: one master and 61 compute nodes; 122 2.4 GHz Intel Xeon processors; 64GB RAM; ~2.4TB disk space; Gigabit network switches (Cisco 3750s); and Gigabit connection to campus backbone.

Petrophysics Laboratory: The Boise State Petrophysics Laboratory supports teaching and research in petrophysics, material science, hydrogeophysics and reservoir geophysics. The focus is on characterizing the physical, chemical, hydraulic and geophysical properties of fluid-saturated geologic materials, and using this information to better understand in situ geologic processes such as infiltration, fluid flow, contaminant transport, compaction, cementation, fracturing and rock-fluid interactions. When complete, the laboratory will enable a wide range of material property measurements to be made on rock and soil samples, including: porosity, permeability, pore fluid content, pore fluid chemistry, grain size and shape, image analysis of thin sections, bulk and grain densities, seismic velocities and electromagnetic properties. Instrumentation and equipment currently in the lab includes sieves, an analytical balance, saturation cell, drying oven, helium pycnometer, high-frequency impedance analyzer, time-domain reflectometer, electrical resistivity tomography test cell, digital oscilloscope, and several computers for data processing and control of lab and field instrumentation. Equipment that we plan to add in the future includes: a fume hood, air and water permeameters, capillary pressure cell, ultrasonic pulse transmission setup, NMR or magnetic resonance imager, gas adsorption surface-area analyzer, contact angle/wettablility setup, and high pressure/temperature cell.

Labs and Facilities housed in other colleges or departments: The Materials Science group in the College of Engineering houses a Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM) facility that is available to researchers in the Department of Geosciences. Research laboratories with appropriate hoods and other minor equipment are housed in the departments of Biology and Chemistry and are available for interdisciplinary research in geobiology and general geochemistry working with affiliated faculty in those departments.

e. Future Plans

Discuss future plans for the expansion or off-campus delivery of the proposed program.

No plans currently exist to deliver the Ph.D. in Geosciences off-campus. Some of the graduate classes offered through the department may become available to students in other parts of the state or region via access-grid teleconference technology.

3. DUPLICATION

If this program is unique to the state system of higher education, a statement to that fact is needed. However, if the program is a duplication of an existing program in the system, documentation

supporting the initiation of such a program must be clearly stated along with evidence of the reason(s) for the necessary duplication. Describe the extent to which similar programs are offered in Idaho, the Pacific Northwest and states bordering Idaho. How similar or dissimilar are these programs to the program herein proposed?

Geosciences encompasses a remarkably broad range of sub disciplines, and Idaho is fortunate to have geology/geosciences departments in its three universities that have unique and complimentary strengths as well as a history of successful collaboration. Idaho State University does not offer a doctoral program in the geosciences, but the University of Idaho offers a doctoral program in geology in Moscow. The proposed program at Boise State University is in the SBOE 8-Year Academic Plan and does not duplicate any program offered by the Idaho public system of higher education in the southwest Idaho service region (the primary service region of Boise State University).

The Chair of the Department of Geosciences at Boise State University has discussed the proposed program with his counterparts at the University of Idaho and Idaho State University, and both have indicated their support of its implementation. The geographic separation and the complementary individual strengths of the geology/geosciences departments in Idaho and surrounding states provide greater opportunities for prospective graduate students to pursue their specific interests for research specialization. For example, one of the cornerstones of the proposed PhD program lies in the application of isotope geochemistry and high-precision geochronology using the new Thermal Ionization Mass Spectrometry laboratory at Boise State, funded by the National Science Foundation. This facility is unique in the interior Northwest region, and it provides a resource that will help to support the research activities of geology/geoscience faculty and students at other universities in Idaho and surrounding areas in addition to the faculty and PhD students at Boise State University.

Doctoral education and research is heavily dependent on individual mentoring of students by research-active faculty advisors. Thus, adding a doctoral program in geosciences at Boise State University, with the largest pool of Geosciences faculty of any institution in the state, will significantly enhance the range of options available to students in Idaho by making available a larger group of potential faculty mentors with more diverse individual skills and research expertise. We also anticipate the faculty at all three Idaho universities to collaborate on research projects and serve on student doctoral committees where appropriate.

All states that border Idaho contain major universities that offer doctoral programs in various areas of the geosciences. For example, the University of Washington (Seattle), Oregon State University (Corvalis), University of Utah (Salt Lake City), and the University of Nevada (Reno) have relatively large Earth Sciences departments. However, these departments have programmatic strengths in sub disciplines such as oceanography, climatology, meteorology, geobiology, space science (planetary physics) economic geology and hydrology - areas of emphasis different from that of the proposed program at Boise State University. The largest of these departments (e.g., University of Washington) are comprehensive enough to contain faculty and research programs that overlap to some extent with the new PhD in Geosciences; however, the specific strengths are complimentary.

4. CENTRALITY

Documentation ensuring that program is consistent with the Board's policy on role and mission is required. In addition, describe how the proposed program relates to the Board's current Statewide Plan for Higher Education as well as the institution's long-range plan.

The following excerpts are from the current role and mission statement formulated by the State Board of Education (SBOE). The excerpts indicate that the proposed program is consistent with the SBOE intentions for Boise State University.

Boise State University "offers a variety of masters and ***select doctoral degrees***" and "conducts coordinated and ***externally funded research studies***."

"Boise State University is a comprehensive, urban university serving a diverse population through undergraduate and ***graduate programs***, ***research***, and state and regional public service."

"Boise State University will formulate its academic plan and generate programs with primary emphasis on business and economics, engineering, the social sciences, public affairs, the performing arts, and teacher preparation. Boise State University will give continuing emphasis in the areas of the health professions, the ***physical and biological sciences***, and education and will maintain basic strengths in the liberal arts and sciences, which provide the core curriculum or general education portion of the curriculum."

5. **DEMAND**
Address student, regional and statewide needs.

Idaho has a fast-growing science and technology based economic sector, currently accounting for more than 25% of the Gross State Product. The potential for economic expansion in this area is significant - however, as of the last national census in 2000, Idaho was tied for 40th place among all states with only 6.8% of its population over the age of 25 holding a graduate degree (Bauman and Graf, 2003). In 2003, Idaho ranked 43rd in the production of doctorates in sciences and engineering (Burrelli, 2004).

Examination of National Science Foundation data indicates the pattern for Geosciences mirrors this overall trend (Figure 2). During the five-year interval from 1999 – 2003, Idaho produced an annual average of only 2 PhD Geoscientists, fewest among all states in the Northwest region (ID, OR, WA, MT, UT, NV, MT) except Montana. One contributing factor is that Idaho has only one PhD program in Geology/Geosciences (offered by the University of Idaho through the main campus in Moscow), and no PhD program is available in the southwest region, where much of the state population, industry, and government agencies that rely on Geosciences are located.

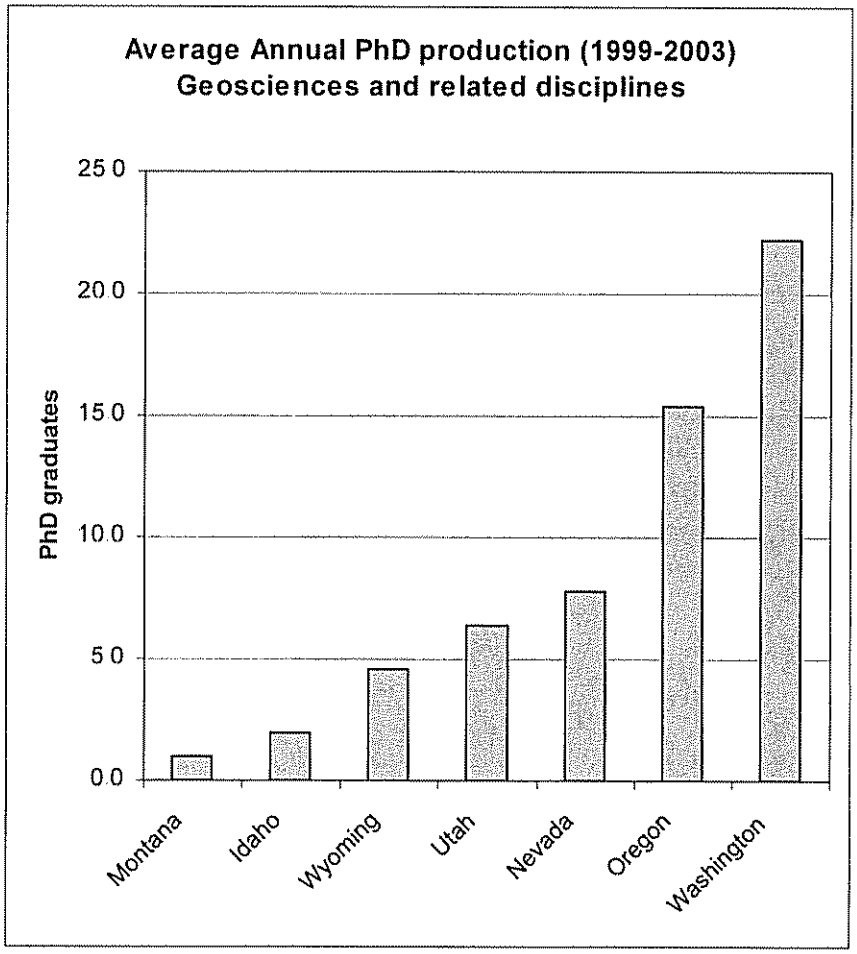

Figure 2: Annual PhD production by state in the Northwest Region. Summary data table is given in Appendix D, and comes from statistics published by the National Science Foundation for 1999-2003.

Because modern industry and its associated diverse economic activity depend on the availability of a skilled workforce in science and engineering, Idaho needs to augment graduate education in these areas to remain economically competitive on a regional and national basis. This perspective was reinforced by the Governor's Science and Technology Advisory Council in 2000, which identified several critical elements necessary to support the growth of a vibrant, knowledge-based economy in Idaho:

1) A research & development base
2) Highly skilled technical workforce
3) Entrepreneurial culture
4) Knowledge transfer mechanism
5) Technology infrastructure
6) Risk capital
7) Attractive quality of life.

Advanced graduate education and research programs in science play a central role in addressing the majority of these individual points. Because much of the science & technology based economic growth in Idaho is occurring in the greater Boise metropolitan area, Boise State University has an important responsibility and role in meeting the growing need for delivery of advanced graduate science programs in Idaho.

Graduates of doctoral programs in the geosciences find employment in a remarkably broad range of industries and organizations involved with earth and environmental processes. Opportunities include policy, regulation, management, and research and development with application to the environment, natural resources, urban planning, and hazards assessment. The attached letters of support provide part of the documentation of the local and regional expression of need and the benefits to be derived from the new PhD program (**Appendix E**).

Data from the Bureau of Labor Statistics (U.S. Department of Labor, *Occupational Outlook Handbook, 2004-05 Edition*) indicate that nearly half of all professional geoscientists - over 120,000 nationally - are employed by state and federal government agencies and the balance occupy private sector jobs. Because of the technical nature of the geosciences, most employment opportunities require advanced graduate degrees with doctoral degrees especially desirable for research positions. In Idaho, as with the nation, fields that rely on geoscientific information and analysis are increasingly important, directly impacting local and regional economies and the quality of life. Creation of a Geosciences doctoral program will provide students, government agencies, the Idaho National Laboratory, and regional industries access to a research-intensive academic program and associated analytical facilities, many of which are unique in the state and region.

Geosciences at Boise State University has growing connection and collaborative research activities with the Idaho National Laboratory (INL) and other state and federal agencies. The new PhD program will provide a local source of personnel and research creativity that will help the geosciences portion of these agencies to be sustainable and successful over the long term.

a. Summarize the needs assessment that was conducted to justify the proposal. The needs assessment should address the following: statement of the problem/concern; the assessment team/the assessment plan (goals, strategies, timelines); planning data collection; implementing date collection; dissemination of assessment results; program design and on-going assessment. (See the Board's policy on outcome assessment.)

The needs assessment that lead to the proposal of a new PhD program in Geosciences included a synthesis of information gathered during the last three years from: (1) direct inquiries to the department and its faculty from potential students expressing their need to complete a PhD in Geosciences and desire to do so at Boise

State; (2) conversations with state and federal agency personnel in the Boise area who conduct geoscience research or evaluate geoscientific information as part of their profession; (3) discussions with research directors and program managers at the Idaho National Laboratory (INL); (4) input from private-sector companies in the Boise area that hire geoscientists; and (5) analysis of job advertisements in national publications seeking applicants with a PhD in geosciences or related disciplines. The direct student inquiries are discussed further in the next section as part of the description of likely sources of students. Attached letters of support are representative of the input obtained from personnel in state and federal agencies, and from the INL. Classified advertisements placed in the leading national publications for the Geosciences (EOS – Transactions of the American Geophysical Union; and GEOTIMES published by the American Geological Institute) in the last three years contained over 530 individual job announcements seeking applications from people with a PhD in Geosciences (or related subdisciplines). These jobs ranged from research and teaching positions in academic institutions, to careers in state or federal government agencies, to a variety of private-sector industry positions. Although a bachelor's degree in an earth science is adequate for a few entry-level jobs, most employers increasingly demand graduate credentials for advancement and long-term employment. The strongest future job growth will be in private sector consulting firms, and the employment outlook for geoscientists is expected to remain strong through at least the next decade, driven primarily by government policy and the need for companies to analyze and comply with environmental laws and regulations (Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook, 2006-07 Edition*). All of these sources suggest a sustained need for personnel with advanced graduate education in the Geosciences.

b. Students

Explain the most likely source of students who will be expected to enroll (full-time, part-time, outreach, etc.). Document student demand by providing information you have about student interest in the proposed program from inside and outside the institution.

Nearly all of the students in the program are expected to be full-time students in residence conducting their coursework and thesis research for approximately 4 - 5 years. The most likely source of these students will be graduates of B.S. and M.S. programs in the state or region, and we expect additional students to come from high-quality science programs across the United States and in other countries. This expectation is based on the inquiries received by faculty members in the Department of Geosciences about the possibility of working on a PhD with them at Boise State. In this regard, the department receives 15-20inquiry contacts annually at national conferences or via phone or email to either the main departmental office or individual faculty members. About half of these inquiries come from students in other countries. This high level of interest exists without any advertising or promotional efforts on the part of the department and speaks to the established quality reputation of our faculty.

Another source of student interest comes from graduates of our existing B.S and M.S. programs; some of the strongest students coming out of our existing programs have expressed the desire to continue their education and pursue a Ph.D. in Geosciences at Boise State, but the lack of a program prevents them from doing so. Some of these students have stopped their education short of achieving the terminal degree. Among those that have gone on to pursue a Ph.D., the overwhelming majority (86% in the last three years) left the state in search of a program that suits their specific interests.

Differentiate between the projected enrollment of new students and those expected to shift from other program(s) within the institution.

No students are anticipated to shift from other programs in the institution (including the existing PhD in Geophysics); all of the projected enrollment will likely come from new students attracted directly to the Geosciences PhD program. The addition of the new PhD in Geosciences will likely have collateral benefit for the enrollment of the existing PhD in Geophysics, because the overall expansion of PhD research and growing reputation of the department on a regional and national basis will help to attract additional applicants to the PhD in Geophysics.

c. Expansion or Extension

If the program is an expansion or extension of an existing program, describe the nature of that expansion or extension. If the program is to be delivered off-campus, summarize the rationale and needs assessment.

Not applicable to the proposed program

6. RESOURCES

Fiscal impact and budget

On this form, indicate the planned FTE enrollment, estimated expenditures, and projected revenues for the first three fiscal years (FY) of the program. Include both the reallocation of existing resources and anticipated or requested new resources. Second and third year estimates should be in constant dollars. Amounts should reflect explanations of subsequent pages. If the program is contract related, explain the fiscal sources and the year-to-year commitment from the contracting agency(ies) or party(ies).

I. PLANNED STUDENT ENROLLMENT

The program will matriculate 2 to 4 new PhD students per year, reaching a steady-state enrollment of approximately 15 students by the fifth year. Students will be funded initially via a combination of appropriated teaching assistantships and research assistantships, then transition after about two years to research assistantships funded through extramural grants awarded to faculty. For purposes of projecting the first three years, we have assumed matriculation of 2 new students in each of the first two years, then matriculation of 4 new students in the third year.

	FY 07		FY 08		FY 09	
	FTE	Headcount	FTE	Headcount	FTE	Headcount
A. New enrollments	2.0	2	4.0	4	8.0	8
B. Shifting enrollments	0	0	0	0	0	0

II. EXPENDITURES

All expenditures for the new program will be supported by reallocation of existing appropriated budgets in the department and college, funding of new resources from the University growth, or by extramural funds generated via grants to geosciences faculty and the overhead generated by these grants. Existing research and academic programs will not be negatively impacted by the reallocation of resources. Increased faculty workload in Geosciences generated by the new PhD program (approximately 3.5 FTE) will be counterbalanced by the addition of four new tenure-track faculty, which will be created by restructuring salary savings gained from replacement of retiring senior faculty with new junior faculty in the college and university. Likewise, the increased demands placed on department support staff, student assistantships, and other expenses are offset by the addition of resources to the department in each of these categories derived from institutional salary savings and/or university growth. An overview of expenditures and revenue in the first three years is given in the next series of tables, followed by a more detailed analysis of costs and funding sources.

	FY 07		FY 08		FY 09	
	FTE	Cost	FTE	Cost	FTE	Cost
A. Personnel Costs						
1. Faculty	3.13	$163,719	3.57	$193,930	3.57	$199,748
2. Administrators	1.88	$67,428	1.88	$69,451	1.88	$71,535
3. Adjunct faculty/Lecturer	0.33	$13,200	0.33	$13,596	0.33	$14,004
4. Graduate/instructional assistants	0	0	0	0	0	0
5. Research personnel	1.48	$64,016	1.85	$83,447	2.23	$103,985
6. Support personnel	0	0	0	0	0	0
7. Fringe benefits	35%	$113,877	35%	$138,405	35%	$155,182
8. Other: Graduate TAs	0.38	$17,000	0.75	$35,020	1.13	$54,105
Total FTE Personnel And Costs;	7.20	$439,240	8.38	$533,849	9.14	$598,559

	FY 07	FY 08	FY 09
B. Operating expenditures			
1. Travel	$15,000	$15,000	$15,000
2. Professional services	0	0	0
3. Other services	0	0	0
4. Communications	$3,150	$3,150	$3,150
5. Utilities	0		
6. Materials & supplies	$3500	$3500	$3500
7. Rentals	$10,000	$10,000	$10,000
8. Repairs & maintenance	$18,100	$18,100	$18,100
9. Materials & goods for manufacture & resale	0	0	0
10. Miscellaneous (Tuition/Fee Waivers)	$11,060	$22,120	$33,180
Total Operating Expenditures:	$60,810	$71,870	$82,930

	FY 07	FY 08	FY 09
C. Capital Outlay			
1. Library resources	$36,377	$36,377	$36,377
2. Equipment	$250,000	$250,000	0
Total Capital Outlay:	$286,377	$286,377	$36,377
D. Physical facilities Construction or major Renovation	0	0	0
E. Indirect costs (overhead)	0	0	0
GRAND TOTAL EXPENDITURES:	$786,427	$892,096	$717,866

III. REVENUES

	FY 07	FY 08	FY 09
A. Source of funds			
1. Appropriated funds -- Reallocation – MCO	$560,177	$615,846	$691,616
2. Appropriated funds -- New – MCO	0	0	0
3. Federal funds	$215,000	$265,000	$15,000
4. Other grants			
5. Fees			
6. Other: F&A return to Department	$11,250	$11,250	$11,250
GRANT TOTAL REVENUES:	$786,427	$892,096	$717,866

	FY 07	FY 08	FY 09
B. Nature of Funds			
1. Recurring*	$560,177	$615,846	$691,616
2. Non-recurring**	$226,250	$276,250	$26,250
GRANT TOTAL REVENUES:	$786,427	$892,096	$717,866

* Recurring is defined as ongoing operating budget for the program which will become part of the base.

** Non-recurring is defined as one-time funding in a fiscal year and not part of the base.

a. Faculty and Staff Expenditures

Project for the first three years of the program, the credit hours to be generated by each faculty member (full-time and part-time), graduate assistant, and other instructional personnel. Also indicate salaries. After total student credit hours, convert to an FTE student basis. Please provide totals for each of the three years presented. Salaries and FTE students should reflect amounts shown on budget schedule.

Tables 1, 2, and 3 illustrate the anticipated credit hour production and Faculty salary costs for the first three years of the program (Year 1 = FY07). Estimated FTE assignment to the program is based on considering distribution of effort in each of the three principal areas of activity for tenure-track faculty – Teaching, Research, and Service. For purposes of this analysis, most tenure-track faculty have FTE assignment to this program at one of three levels: 0.33 FTE for heavily involved faculty who form the foundation of the program; 0.22 FTE for faculty that will make major contributions, but retain significant undergraduate teaching or service obligations in other areas (e.g., the department chair); and 0.11 FTE for faculty that will contribute to the program, but in a more limited way due to differences in research and/or teaching focus (e.g., the Geophysics faculty).

Table 1: Faculty Expenditures, First Year

Name, Position, Rank	Annual Salary Rate (9 months)	FTE Assignment to this Program	Program Salary Dollars	Projected Student Credit Hours	FTE Students @ 12 credits/sem (divisor 24)
Benner, Tenure-Track Faculty, Asst Prof	$ 52,510	0.330	$17,328	6	0.25
Bradford, Tenure-Track Faculty, Asst Prof	$ 52,790	0.110	$5,807	0	0.00
McNamara, Tenure-Track Faculty, Assoc Prof	$ 53,547	0.330	$17,671	12	0.50
Michaels, Tenure-Track Faculty, Assoc Prof	$ 58,644	0.110	$6,451	0	0.00
Northrup, Tenure-Track Faculty, Assoc Prof	$ 58,428	0.220	$12,854	12	0.50
Pelton, Tenure-Track Faculty, Full Prof	$ 18,744	0.050	$937	0	0.00
Pierce, Tenure-Track Faculty, Asst Prof	$ 47,500	0.330	$15,675	6	0.25
Routh, Tenure-Track Faculty, Asst Prof	$ 48,838	0.110	$5,372	0	0.00
Schmitz, Tenure-Track Faculty, Asst Prof	$ 50,415	0.330	$16,637	6	0.25
Snyder, Tenure-Track Faculty, Full Prof	$ 62,208	0.220	$13,686	0	0.00
White, Tenure-Track Faculty, Full Prof	$ 62,619	0.220	$13,776	0	0.00
Wilkins, Tenure-Track Faculty, Asst Prof	$ 47,045	0.330	$15,525	0	0.00
van Wijk, Tenure-Track Faculty, Asst Prof	$ 50,000	0.110	$5,500	0	0.00
New Tenure-Track Faculty (begin 06)	$ 50,000	0.330	$16,500	6	0.25
Total:	**$ 713,288**	**3.13**	**$ 163,719**	**48.00**	**2.00**

Name, Position, Rank	Annual Salary Rate (9 months)	FTE Assignment to this Program	Program Salary Dollars	Projected Student Credit Hours	FTE Students @ 12 credits/sem (divisor 24)
Benner, Tenure-Track Faculty, Asst Prof	$ 54,085	0.330	$17,848	18	0.75
Bradford, Tenure-Track Faculty, Asst Prof	$ 54,374	0.110	$5,981	0	0.00
McNamara, Tenure-Track Faculty, Assoc Prof	$ 55,153	0.330	$18,201	18	0.75
Michaels, Tenure-Track Faculty, Assoc Prof	$ 60,403	0.110	$6,644	0	0.00
Northrup, Tenure-Track Faculty, Assoc Prof	$ 60,181	0.220	$13,240	18	0.75
Pelton, Tenure-Track Faculty, Full Prof	$ 19,306	0.050	$965	0	0.00
Pierce, Tenure-Track Faculty, Asst Prof	$ 48,925	0.330	$16,145	12	0.50
Routh, Tenure-Track Faculty, Asst Prof	$ 50,303	0.110	$5,533	0	0.00
Schmitz, Tenure-Track Faculty, Asst Prof	$ 51,927	0.330	$17,136	18	0.75
Snyder, Tenure-Track Faculty, Full Prof	$ 64,074	0.220	$14,096	3	0.13
White, Tenure-Track Faculty, Full Prof	$ 64,498	0.220	$14,189	3	0.13
Wilkins, Tenure-Track Faculty, Asst Prof	$ 48,456	0.330	$15,991	0	0.00
van Wijk, Tenure-Track Faculty, Asst Prof	$ 51,500	0.110	$5,665	0	0.00
New Tenure-Track Faculty (begin 06)	$ 51,500	0.330	$16,995	6	0.25
New Tenure-Track Faculty (begin 07)	$ 60,000	0.330	$19,800	0	0.00
New Tenure-Track Faculty (begin 07)	$ 50,000	0.110	$5,500	0	0.00
Total:	**$ 844,687**	**3.57**	**$ 193,930**	**96.00**	**4.00**

Table 3: Faculty Expenditures, Third Year

Name, Position, Rank	Annual Salary Rate (9 months)	FTE Assignment to this Program	Program Salary Dollars	Projected Student Credit Hours	FTE Students @ 12 credits/sem (divisor 24)
Benner, Tenure-Track Faculty, Asst Prof	$ 55,708	0.330	$18,384	18	0.75
Bradford, Tenure-Track Faculty, Asst Prof	$ 56,005	0.110	$6,161	3	0.13
McNamara, Tenure-Track Faculty, Assoc Prof	$ 56,808	0.330	$18,747	24	1.00
Michaels, Tenure-Track Faculty, Assoc Prof	$ 62,215	0.110	$6,844	3	0.13
Northrup, Tenure-Track Faculty, Assoc Prof	$ 61,986	0.220	$13,637	24	1.00
Pelton, Tenure-Track Faculty, Full Prof	$ 19,886	0.050	$994	3	0.13
Pierce, Tenure-Track Faculty, Asst Prof	$ 50,393	0.330	$16,630	24	1.00
Routh, Tenure-Track Faculty, Asst Prof	$ 51,812	0.110	$5,699	3	0.13
Schmitz, Tenure-Track Faculty, Asst Prof	$ 53,485	0.330	$17,650	36	1.50
Snyder, Tenure-Track Faculty, Full Prof	$ 65,996	0.220	$14,519	3	0.13
White, Tenure-Track Faculty, Full Prof	$ 66,432	0.220	$14,615	6	0.25
Wilkins, Tenure-Track Faculty, Asst Prof	$ 49,910	0.330	$16,470	12	0.50
van Wijk, Tenure-Track Faculty, Asst Prof	$ 53,045	0.110	$5,835	3	0.13
New Tenure-Track Faculty (begin 06)	$ 53,045	0.330	$17,505	18	0.75
New Tenure-Track Faculty (begin 07)	$ 61,800	0.330	$20,394	12	0.50
New Tenure-Track Faculty (begin 07)	$ 51,500	0.110	$5,665	6	0.25
Total:	**$ 818,527**	**3.57**	**$ 199,748**	**192.00**	**8.00**

The program is anticipated to reach steady-state enrollment after five years, with a total program-specific faculty effort of about 3.5 FTE, and a student FTE of approximately 15.

Project the need and cost for support personnel and any other personnel expenditures for the first three years of the program.

Anticipated costs and revenues to support Administrative Staff, Research Staff, and Other Staff associated with the Ph.D. program in the first three years are shown in Tables 4, 5, and 6.

Staff Position	Complete		Program Specific			Appropriated Reallocation		Federal
	Salary	FTE	Salary	FTE	% Salary	Geo Dept.	college/univ	funds
Administrative Staff								
Department Chair	$ 58,428	1 000	$ 8,764	0 150	15%	$ 8,764		
PhD Program Coordinator	$ 50,415	1 000	$ 7,562	0 150	15%	$ 7,562		
Management Assistant	$ 38,700	1 000	$ 12,771	0 330	33%		$ 12,771	
Grants Accountant	$ 38,360	1 000	$ 9,590	0 250	25%	$ 6,590	$ 3,000	
Admin Assistant I	$ 16,241	0 750	$ 5,414	0 250	33%	$ -	$ 5,414	
Computer Syst Admin	$ 46,375	1 000	$ 11,594	0 250	25%	$ 11,594		
Education Program Dir (new)	$ 39,000	1 000	$ 9,750	0 250	25%		$ 9,750	
Student employees	$ 11,900	1 500	$ 1,983	0 250	17%	$ 1,983		
subtotals:	**$ 299,419**	**8.250**	**$ 67,428**	**1.880**	**23%**	**$ 36,494**	**$ 30,935**	**$ -**
Research Staff								
GIS Lab Manager	$ 55,446	1 000	$ 2,772	0 050	5%	$ 2,772		
GIS Analyst	$ 16,391	0 500	$ 1,639	0 050	10%	$ 1,639		
Field Equipment Tech	$ 25,210	1 000	$ 12,605	0 500	50%	$ -	$ 12,605	
TIMS Lab Tech (new)	$ 45,000	0 750	$ 15,000	0 250	33%		$ 15,000	
Aq Geochem Tech (new)	$ 45,000	0 750	$ 15,000	0 250	33%			$ 15,000
PhD Graduate RA 1 (new)	$ 17,000	0 375	$ 17,000	0 375	100%		$ 17,000	
subtotals:	**$ 204,047**	**4.375**	**$ 64,016**	**1.475**	**31%**	**$ 4,411**	**$ 44,605**	**$ 15,000**
Other Staff								
PhD Graduate TA 1 (new)	$ 17,000	0 375	$ 17,000	0 375	100%		$ 17,000	
Intro Geology Lecturer (new)	$ 40,000	1 000	$ 13,200	0 330	33%		$ 13,200	
subtotals:	**$ 57,000**	**1.375**	**$ 30,200**	**0.705**	**53%**	**$ -**	**$ 30,200**	**$ -**
Total Staff and Other Personnel:	**$ 560,466**	**14.000**	**$ 161,645**	**4.060**	**29%**	**$ 40,905**	**$ 105,740**	**$ 15,000**

Table 5: Staff and Other Personnel Expenditures, Year 2

Staff Position	Complete		Program Specific			Appropriated Reallocation		Federal
	Salary	FTE	Salary	FTE	% Salary	Geo Dept.	college/univ	funds
Administrative Staff								
Department Chair	$ 60,181	1 000	$ 9,027	0 150	15%	$ 9,027		
PhD Program Coordinator	$ 51,927	1 000	$ 7,789	0 150	15%	$ 7,789		
Management Assistant	$ 39,861	1 000	$ 13,154	0 330	33%		$ 13,154	
Grants Accountant	$ 39,511	1 000	$ 9,878	0 250	25%	$ 6,788	$ 3,090	
Admin Assistant I	$ 16,728	0 750	$ 5,576	0 250	33%	$ -	$ 5,576	
Computer Syst Admin	$ 47,766	1 000	$ 11,942	0 250	25%	$ 11,942		
Education Program Dir (new)	$ 40,170	1 000	$ 10,043	0 250	25%		$ 10,043	
Student employees	$ 12,257	1 500	$ 2,043	0 250	17%	$ 2,043		
subtotals:	**$ 308,402**	**8.250**	**$ 69,451**	**1.880**	**23%**	**$ 37,588**	**$ 31,863**	**$ -**
Research Staff								
GIS Lab Manager	$ 57,109	1 000	$ 2,855	0 050	5%	$ 2,855		
GIS Analyst	$ 16,883	0 500	$ 1,688	0 050	10%	$ 1,688		
Field Equipment Tech	$ 25,966	1 000	$ 12,983	0 500	50%	$ -	$ 12,983	
TIMS Lab Tech (new)	$ 46,350	0 750	$ 15,450	0 250	33%		$ 15,450	
Aq Geochem Tech (new)	$ 46,350	0 750	$ 15,450	0 250	33%			$ 15,450
PhD Graduate RA 1 (new)	$ 17,510	0 375	$ 17,510	0 375	100%		$ 17,510	
PhD Graduate RA 2 (new)	$ 17,510	0 375	$ 17,510	0 375	100%		$ 17,510	
subtotals:	**$ 227,678**	**4.750**	**$ 83,447**	**1.850**	**37%**	**$ 4,544**	**$ 63,453**	**$ 15,450**
Other Staff								
PhD Graduate TA 1 (new)	$ 17,510	0 375	$ 17,510	0 375	100%		$ 17,510	
PhD Graduate TA 2 (new)	$ 17,510	0 375	$ 17,510	0 375	100%		$ 17,510	
Intro Geology Lecturer (new)	$ 41,200	1 000	$ 13,596	0 330	33%		$ 13,596	
subtotals:	**$ 76,220**	**1.750**	**$ 48,616**	**1.080**	**64%**	**$ -**	**$ 48,616**	**$ -**
Total Staff and Other Personnel:	**$ 612,300**	**14.750**	**$ 201,514**	**4.810**	**33%**	**$ 42,132**	**$ 143,932**	**$ 15,450**

Table 6: Staff and Other Personnel Expenditures, Year 3								
	Complete		Program Specific			Appropriated Reallocation		Federal
Name, Staff Position	Salary	FTE	Salary	FTE	% Salary	Geo Dept.	college/univ	funds
Administrative Staff								
Department Chair	$ 61,986	1 000	$ 9,298	0 150	15%	$ 9,298		
PhD Program Coordinator	$ 53,485	1 000	$ 8,023	0 150	15%	$ 8,023		
Management Assistant	$ 41,057	1 000	$ 13,549	0 330	33%		$ 13,549	
Grants Accountant	$ 40,696	1 000	$ 10,174	0 250	25%	$ 6,991	$ 3,183	
Admin Assistant I	$ 17,230	0 750	$ 5,743	0 250	33%	$ -	$ 5,744	
Computer Syst Admin	$ 49,199	1 000	$ 12,300	0 250	25%	$ 12,300	$ -	
Education Program Dir (new)	$ 41,375	1 000	$ 10,344	0 250	25%		$ 10,344	
Student employees	$ 12,625	1 500	$ 2,104	0 250	17%	$ 2,104		
subtotals:	**$ 317,654**	**8.250**	**$ 71,535**	**1.880**	**23%**	**$ 38,716**	**$ 32,819**	**$ -**
Research Staff								
GIS Lab Manager	$ 58,823	1 000	$ 2,941	0 050	5%	$ 2,941		
GIS Analyst	$ 17,389	0 500	$ 1,739	0 050	10%	$ 1,739		
Field Equipment Tech	$ 26,745	1 000	$ 13,373	0 500	50%	$ -	$ 13,373	
TIMS Lab Tech (new)	$ 47,741	0 750	$ 15,914	0 250	33%		$ 15,914	
Aq Geochem Tech (new)	$ 47,741	0 750	$ 15,914	0 250	33%			$ 15,914
PhD Graduate RA 1 (new)	$ 18,035	0 375	$ 18,035	0 375	100%		$ 18,035	
PhD Graduate RA 2 (new)	$ 18,035	0 375	$ 18,035	0 375	100%		$ 18,035	
PhD Graduate RA 3 (new)	$ 18,035	0 375	$ 18,035	0 375	100%		$ 18,035	
subtotals:	**$ 252,544**	**5.125**	**$ 103,985**	**2.225**	**41%**	**$ 4,680**	**$ 83,392**	**$ 15,914**
Other Staff								
PhD Graduate TA 1 (new)	$ 18,035	0 375	$ 18,035	0 375	100%		$ 18,035	
PhD Graduate TA 2 (new)	$ 18,035	0 375	$ 18,035	0 375	100%		$ 18,035	
PhD Graduate TA 3 (new)	$ 18,035	0 375	$ 18,035	0 375	100%		$ 18,035	
Intro Geology Lecturer (new)	$ 42,436	1 000	$ 14,004	0 330	33%		$ 14,004	
subtotals:	**$ 96,542**	**1.750**	**$ 68,109**	**1.455**	**71%**	**$ -**	**$ 68,109**	**$ -**

Administrative Staff: The Department of Geosciences administrative staff currently includes the following personnel:

1) Administrative Assistant II, (1.0 FTE appropriated) who manages the day-to-day activities of the departmental office and staff
2) Grants Accountant (1.0 FTE appropriated, in College of Arts & Sciences budget) who provides accounting support for all extramural grants and departmental appropriated and local accounts. This position also oversees payroll and helps with the annual departmental budgeting process.
3) Computer Systems Administrator (0.85 FTE appropriated in Geosciences, 0.15 FTE in Graduate College), who supports and administers the departmental computer network, maintains system server and desktop hardware, and manages software distribution.
4) Administrative Assistant I (0.50 FTE appropriated) focused on support for the academic programs – facilitates admissions process, maintains student files, handles departmental forms associated with the graduate programs, etc. This person also processes travel and minor purchasing for the department.
7) Student employees (various FTE and sources of funding) who help with office filing and miscellaneous other duties in the office and research units of the Geosciences department.

Beginning in spring 2006, the administrative support staff will be augmented. The FTE of the AAI will be increased to 0.75 FTE (30 hrs/week) to facilitate coverage of increased travel & purchasing activity and the expanded demands of growing graduate programs. Because the scope, complexity, and overall demands placed on the staff are increasing due to the addition of the new PhD program, the department will need an office manager with increased responsibility and decision making authority. Thus, the Administrative Assistant II position will be up-graded to the title of Management Assistant (Classified Staff) or Business Manager (Professional Staff), with a salary increase consistent with the PhD program specific FTE assignment. Also, because the number and complexity of grant, appropriated and local accounts is rapidly increasing in Geosciences due to the growing graduate programs and associated growing focus in research, the support for the Grants Accountant position will be augmented appropriately.

National recruiting, student mentoring, and outcomes assessment activities are critical for the long-term success of graduate programs. In addition, assessment plans are increasingly scrutinized as part of on-going accreditation review. To facilitate these activities in a consistent and thorough manner for all of our academic programs, the department will add a new staff position beginning with the Fall 2006 semester with the title of Education Program Director (0.6 FTE in Spring 2006, moving to 1.0 FTE beginning Fall 2006). A core responsibility of this position will be to organize and implement substantive recruiting and assessment activities for all academic programs in geosciences. 25% of this position has been allocated to the new PhD program in Geosciences.

Research Staff: The department research staff currently includes the following:

1) Manager for the Geospatial Research Facility (0.39 FTE appropriated, 0.61 FTE soft money), who oversees day-to-day operations of the GRF, organizes ESRI short-course delivery, conducts extramural contract work using GIS and web-based programming in support of faculty research activities.
2) GIS Analyst (0.5 FTE soft money), who does contract GIS work on extramural grants, and teaches ESRI certified short-courses in GIS.
3) Field equipment manager / sample preparation lab technician (0.5 FTE soft money), who manages the storage and use of departmental field research equipment, maintains and oversees the use of the rock saws and thin-section equipment as well as the rock crushing and mineral separation facility.

Beginning with the Spring 06 semester, 0.5 FTE appropriated support will be added to the field equipment manager / sample preparation lab technician position to stabilize it and grow its FTE basis in support of the expanding graduate programs. Two laboratory technicians will be added to the research staff beginning in the 06-07 academic year, one associated with the isotope geochemistry Thermal Ionization Mass Spectrometry (TIMS) lab, and one associated with the water and soil geochemistry laboratory. For purposes of this analysis 0.25 FTE of each technician has been assigned to the new PhD program, because of the research-intensive nature of PhD studies. The full salary of the TIMS lab technician will be supported with 0.75 FTE of appropriated funds and the balance from extramural grant activity, and the water and soil geochemistry lab technician will be supported initially from grant sources (already awarded via NSF-EPSCoR), and transition to a combination of appropriated base and extramural grant support in the future. Commitment to the long-term appropriated support of each technician has been provided by the university as part of the extramural proposals that were funded for purchase of the equipment for each lab. Departmental PhD Research Assistantships will also be available to hire graduate students as part-time research staff (details below), providing flexibility to adapt to emerging needs or handle transient peaks in research activities in various laboratories or research programs.

Graduate Assistantships and Introductory Geology Lecturer: The department currently has 9 Graduate Assistantships ($10,987 stipend per academic year, plus fee waiver) used primarily to support the MS degree programs and three Ph.D fellowships ($17,000 stipend per academic year, plus fee waiver) used to support the existing Ph.D. in Geophysics. Beginning with the initiation of the new Ph.D. in Geosciences, and phased in over three years, a total of six new PhD Graduate Assistantships will be added to the student funding available through the department ($17,000 stipend per academic year, plus fee waiver). Each assistantship will employ a student for 20 hours/week during the 9-month academic year (0.375 FTE) and be in the form of either a Teaching Assistantship (TA) that will aid curriculum delivery or Research Assistantship (RA) that will support research laboratories and facilities. The TA's provide the student workforce necessary to support the teaching of the introductory geology labs and upper division courses in the undergraduate curriculum. They play a critical role in the delivery of the undergraduate curriculum as well as provide real-world teaching experiences for graduate students – an important part of the professional development of the graduate students, particularly at the PhD level.

To maintain sufficient teaching bandwidth and insure continued excellence of the undergraduate programs while simultaneously growing research-intensive graduate programs, the department will establish beginning with the Fall 06 semester and full-time Lecturer position, which will focus on delivery of the large enrollment introductory Geology classes. Although focused on undergraduate education, this position is warranted because of the addition of the PhD program; therefore, 0.33 FTE of this position has been included in the cost structure for the new program.

b. Administrative Expenditures

Describe the proposed administrative structure necessary to ensure program success and the cost of that support. Include a statement concerning the involvement of other departments, colleges, or other institutions and the estimated cost of their involvement in the proposed program

See preceding section for a description of the department administrative staff necessary to ensure program success. Regarding involvement of other departments, colleges or institutions: Students in the program will utilize graduate course work available in a few other departments on a case-by-case basis (primarily Math, Biology, Civil Engineering), and may invite participation of faculty in other departments on their Supervisor Committee depending on their individual dissertation research topics. However, the amount of FTE or other costs to other departments, colleges or institutions is anticipated to be negligible and is not reflected quantitatively in the analysis of program impacts presented here.

c. Operating Expenditures (travel, professional services, etc.)
Briefly explain the need and cost for operating expenditures.

Anticipated operating expenditures and associated revenues for the first three years of the program are itemized in Tables 7, 8, and 9.

Table 7: Annual Operating Expenditures and Revenues, Year 1

Operating Expenses	cost	Appropriated Reallocation	Other
Travel			
PhD student recruiting	$ 4,000	$ 4,000	
Students to professional meetings	$ 5,000	$ 5,000	
External lecture series	$ 6,000	$ 6,000	
subtotals:	**$ 15,000**	**$ 15,000**	$ -
Communications			
phone	$ 3,150	$ 3,150	
subtotals:	**$ 3,150**	**$ 3,150**	$ -
Materials & Supplies			
paper	$ 250	$ 250	
computers	$ 2,000	$ 2,000	
misc. office	$ 1,250	$ 1,250	
subtotals:	**$ 3,500**	**$ 3,500**	$ -
Rentals			
research equipment use fees	$ 10,000	$ 5,000	$ 5,000
subtotals:	**$ 10,000**	**$ 5,000**	**$ 5,000**
Repairs & maintenance			
microsopes	$ 1,000	$ 1,000	
Geochemistry instrumentation	$ 16,000	$ 10,000	$ 6,000
computers	$ 600	$ 600	
other miscellanoeus equipment	$ 500	$ 250	$ 250
subtotals:	**$ 18,100**	**$ 11,850**	**$ 6,250**
Miscellaneous			
Graduate Assistant fee waivers	$ 11,060	$ 11,060	
subtotals:	**$ 11,060**	**$ 11,060**	$ -
OE Total:	**$ 60,810**	**$ 49,560**	**$ 11,250**

Table 8: Annual Operating Expenditures and Revenues, Year 2			
Operating Expenses	cost	Appropriated Reallocation	Other
Travel			
PhD student recruiting	$ 4,000	$ 4,000	
Students to professional meetings	$ 5,000	$ 5,000	
External lecture series	$ 6,000	$ 6,000	
subtotals:	**$ 15,000**	**$ 15,000**	**$ -**
Communications			
phone	$ 3,150	$ 3,150	
subtotals:	**$ 3,150**	**$ 3,150**	**$ -**
Materials & Supplies			
paper	$ 250	$ 250	
computers	$ 2,000	$ 2,000	
misc. office	$ 1,250	$ 1,250	
subtotals:	**$ 3,500**	**$ 3,500**	**$ -**
Rentals			
research equipment use fees	$ 10,000	$ 5,000	$ 5,000
subtotals:	**$ 10,000**	**$ 5,000**	**$ 5,000**
Repairs & maintenance			
microsopes	$ 1,000	$ 1,000	
Geochemistry instrumentation	$ 16,000	$ 10,000	$ 6,000
computers	$ 600	$ 600	
other miscellanoeus equipment	$ 500	$ 250	$ 250
subtotals:	**$ 18,100**	**$ 11,850**	**$ 6,250**
Miscellaneous			
Graduate Assistant fee waivers	$ 22,120	$ 22,120	
subtotals:	**$ 22,120**	**$ 22,120**	**$ -**
Total OE:	**$ 71,870**	**$ 60,620**	**$ 11,250**

Table 9: Annual Operating Expenditures and Revenues, Year 3			
Operating Expenses	cost	Appropriated Reallocation	Other
Travel			
PhD student recruiting	$ 4,000	$ 4,000	
Students to professional meetings	$ 5,000	$ 5,000	
External lecture series	$ 6,000	$ 6,000	
subtotals:	**$ 15,000**	**$ 15,000**	**$ -**
Communications			
phone	$ 3,150	$ 3,150	
subtotals:	**$ 3,150**	**$ 3,150**	**$ -**
Materials & Supplies			
paper	$ 250	$ 250	
computers	$ 2,000	$ 2,000	
misc office	$ 1,250	$ 1,250	
subtotals:	**$ 3,500**	**$ 3,500**	**$ -**
Rentals			
research equipment use fees	$ 10,000	$ 5,000	$ 5,000
subtotals:	**$ 10,000**	**$ 5,000**	**$ 5,000**
Repairs & maintenance			
microsopes	$ 1,000	$ 1,000	
Geochemistry instrumentation	$ 16,000	$ 10,000	$ 6,000
computers	$ 600	$ 600	
other miscellanoeus equipment	$ 500	$ 250	$ 250
subtotals:	**$ 18,100**	**$ 11,850**	**$ 6,250**
Miscellaneous			
Graduate Assistant fee waivers	$ 33,180	$ 33,180	
subtotals:	**$ 33,180**	**$ 33,180**	**$ -**
Totoal OE:	**$ 82,930**	**$ 71,680**	**$ 11,250**

Travel: As with any graduate program, its quality and success depend largely on our ability to connect with the very best applicants and attract them into our program. To that end, we have budgeted $4,000 per year to facilitate travel associated with recruiting efforts. Most of this would support bringing PhD applicants on campus for an interview prior to admission to the program. Because we will be making a large resource investment in each student in the program, we consider a personal interview an important part of the recruitment and selection process. We also have budgeted travel funds to support the travel of students in the PhD program to national professional meetings (Geological Society of America, American Geophysical Union, etc.), because connection with the national science community is a critical part of the education and maturation of Geoscientists at the PhD level. In that same vein, we have budgeted $6,000 per year to fund an external speaker series in the department. This will bring several nationally prominent scientists per year to the department as invited lecturers. Boise State benefits from this activity in at least two important ways: first, it helps to connect our students and faculty to leading edge research on a national basis. Second, it serves as an important advertisement for our programs – visiting scientists get a first-hand impression of our University, faculty, students and programs, enhancing our national reputation for excellence.

Communications: Our projected expenses include $3,150 per year in support for additional telephone communications (hardware and ongoing costs like long-distance services). This estimate is based on the current costs of telephone service for the existing faculty and graduate students and making a proportional increase for anticipated new faculty and graduate students.

Materials and Supplies: We anticipate modest increases in general materials and supplies, as indicated in Tables 7, 8, and 9, based on expansion of the faculty and graduate student population.

Rentals: Projected expenses in this category ($10,000) reflect a general estimate of the charges the department will incur for using research equipment in teaching classes. Because much of the research equipment will be managed in Recharge Centers to facilitate cost recovery for long-term maintenance, academic use of the research equipment purchased on grants will come with billable costs to the department. We acknowledge significant uncertainty in the estimated magnitude of this expense; the actual costs for academic use of research equipment (i.e., providing hands-on experiences with research equipment as part of academic coursework) will depend on the evolving rate structures of the Recharge Centers, the specific types of equipment or instrumentation utilized, and the amount of use by the various classes in the curriculum. Thus, the reallocation of funds to support academic use of research equipment will probably need to be analyzed and adjusted on a regular basis. For purposes of this analysis, revenues to support this cost have been distributed evenly between reallocation of appropriated funds and "other" sources. In this case, the other source will likely be overhead revenues derived from grants, a portion of which is distributed to the department.

Repairs and Maintenance: We anticipate increased expenses for the on-going repair and maintenance of teaching and research equipment like petrographic microscopes, laboratory equipment, computers, etc. In particular, the suite of Geochemistry labs (TIMS, water and soil chemistry, light stable isotope) will have significant maintenance costs. Funds for much of this maintenance will come from the extramural grant activity supporting the research in these labs; however, the department and university will need to bear part of these expenses as well, as reflected in Tables 7, 8, and 9. As with the anticipated Rental costs, there are significant uncertainties in the estimated costs for repairs and maintenance. The budget identifies two sources of revenue to cover the Repairs and Maintenance costs: appropriated funds and "other" sources, which will likely include overhead charged to grants. Budgets for repair and maintenance of equipment will need to be evaluated on an on-going basis.

Miscellaneous: We have included anticipated costs of fee waivers for the new PhD Graduate Assistantships in this cost category. The three year projection contains funding for a total of six assistantships phased in by adding two per year.

d. Capital Outlay

(1) Library resources

(a) Evaluate library resources, including personnel and space. Are they adequate for the operation of the present program? If not, explain the action necessary to ensure program success.

The current library facilities (including personnel and space) are inventoried in section 2 (p. 14) and are considered sufficient to initiate the new graduate program. However, library resources will need to be augmented over time. The university administration recognizes the critical role of the library in supporting quality graduate programs across campus.

(b) Indicate the costs for the proposed program including personnel, space, equipment, monographs, journals, and materials required for the program.

The current monograph budget for Geosciences is $14,015, and the serials budget is $96,219. Both will be expanded over time to include more electronic journal subscriptions and an increased spectrum of journal availability. Because of the Research-intensive nature of PhD programs, a relatively large percentage of the existing Geosciences library budget ($36,377 or 33%) is shown as reallocated to this specific program in the Expense and Revenue Tables. The Library resource base for the PhD program will continue to sustain the other MS and BS programs in the department as well, because a library sufficient to support PhD research in Geosciences is also capable of supporting the other programs at little additional cost.

(c) For off-campus programs, clearly indicate how the library resources are to be provided.

Not Applicable.

(2) Equipment/Instruments

Describe the need for any laboratory instruments, computer(s), or other equipment. List equipment, which is presently available and any equipment (and cost) which must be obtained to support the proposed program.

The Department has a variety of field and laboratory research equipment as needed to support active research programs across the broad range of subdisciplines in Geosciences (See section 2d – Laboratories, Equipment and Instrumentation).

Major new research equipment is being acquired by faculty through extramural grant activity. For example, the instrumentation for the Thermal Ionization Mass Spectrometry Laboratory will be obtained from a $600,000 NSF Major Research Instrumentation (MRI) grant awarded to Dr. Schmitz in the current year (FY06). Similarly, the suite of instrumentation for the Water and Soil Geochemistry Laboratory is being assembled largely from one-time NSF-EPSCoR funds awarded to Dr. McNamara and Dr. Benner ($200,000 in FY 07, Year 1 of the program). The department has student computer laboratories with up-to-date software and hardware to facilitate the studies, data analysis, and thesis research of graduate students. A wide variety of other major and minor research equipment and instrumentation has been obtained by individual faculty members through their start-up research funds and extramural grant activities. Projections for the first year of the program (FY07) include $50,000 of one-time start-up funding for the new tenure-track faculty member arriving in fall 2006 (for development of a stable isotope analytical facility in the first few years of his or her professional residency at Boise State). Consequently, Year 2 projections anticipate the acquisition of a stable isotope mass spectrometer via extramural grant funds obtained by the new faculty member (approximately $250,000).

Physical Facilities Construction or major Renovation: In anticipation of growing graduate programs in the Department of Geosciences, Boise State University, has invested significant one-time funding in major remodeling projects already approved by the SBOE to enhance the research infrastructure of the department in FY04, FY05, and FY06 (current fiscal year). These include approximately $630,000 to build the isotope geochemistry and geochronology TIMS laboratory suite (anticipated completion December 05), and approximately $495,000 for a remodel to produce the water and soil geochemistry laboratory and light stable isotope geochemistry laboratory, as well and some new office space (anticipated completion in spring 06). Because these remodel costs pre-date the first year of the program, they are not reflected in the three-year budget analysis; however, they constitute an important contribution to the long-term resource base of the PhD program.

e. Revenue Sources

(1) If funding is to come from the reallocation of existing state appropriated funds, please indicate the sources of the reallocation. What impact will the reallocation of funds in support of the program have on other programs?

All revenue to support this program will come from either reallocation of existing resources within the department, College or university, or from extramural grants awarded to Geosciences faculty from a variety of sources (primarily Federal agencies). Existing programs will not be impacted substantially because the new program builds on the foundation of graduate courses currently available in the Department of Geosciences. Reallocated funding for new faculty lines and other on-going expenses associated with the PhD program will come from salary savings derived from the replacement of retired senior faculty with new junior faculty in the college or university.

(2) If an above Maintenance of Current Operations (MCO) appropriation is required to fund the program, indicate when the institution plans to include the program in the legislative budget request.

Not Applicable.

(3) Describe the federal grant, other grant(s), special fee arrangements, or contract(s) to fund the program. What does the institution propose to do with the program upon termination of those funds?

Dissertation research activities, new research equipment purchases, and on-going maintenance or replacement of existing research equipment will be funded primarily from proposals submitted by the geosciences faculty to federal agencies that fund geoscientific research, instrumentation, and facilities (e.g., National Science Foundation, DoE, EPA). Extramural grant activity in the Department of Geosciences excluding the CGISS geophysical research center is currently at approximately $1 million per year, and has increased an average of 45% per year in the last five years. CGISS adds about $900,000 per year of extramural funding, bringing the total current Geosciences research funding to about $1.9 million per year. Given that new research-active faculty have been hired in the last couple of years and the anticipation of adding additional faculty next year, the increasing trend line of extramural research funding should continue for the next several years, and produce a strong, steady-state foundation of funding for research and teaching activities associate with the new PhD program on an on-going basis.

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APPENDIX A:

Doctor of Philosophy in Geosciences
Boise State University
External Program Review Report

REVIEW DATE
October 20-21, 2005

REVIEW TEAM

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I. SUMMARY OF FINDINGS

Doctor of Philosophy in Geosciences Endorsement

The External Program Review Team (EPRT) strongly endorses the proposed Ph.D. in Geosciences as described in the draft Program Proposal. The EPRT further recommends to BSU that the program plan be submitted to the Idaho Board of Education for consideration as soon as possible to allow students to be recruited and admitted to BSU beginning in the Fall 2006. We believe that the Geosciences Department and BSU is well positioned and prepared to implement this degree program immediately

Qualifications of the Geosciences Faculty

The External Program Review Team recognizes the outstanding quality of the Geosciences faculty and their students. The Geosciences faculty members are nationally recognized for their research in the three principal focus areas of the department. The quality of students currently enrolled in the Department's existing MS and doctoral program are conducting high-level research projects and routinely present their work at the national level. Furthermore, the ERPT commends the shared vision of the department and university administration. The support of the university administration for geosciences is excellent, and we fully support the planning efforts of the administration in the areas of facilities planning and faculty support. Finally, we note that the Geosciences Department has already successfully developed and implemented a doctoral program in Geophysics, and we are confident that the Department is both prepared and correctly positioned to expand their offerings at the doctoral level.

Potential Contributions to Idaho's Environment, Economy and Vitality

The proposal has more than adequately demonstrated the need for graduate-level geoscientists in Idaho and the region. The development of this doctoral program at BSU is directly coincident with the University's strategic goals of advancing the sciences and engineering for the fast-growing Boise area.

Contribution to Undergraduate Education

The External Program Review Team recognizes and supports the concept that strong graduate programs directly and indirectly improve the quality of undergraduate education. The proposed doctorate in Geosciences will allow participation of undergraduates directly in research projects. Such participation is a well-recognized pedagogical tool. The proposed degree will also indirectly advance undergraduate education by a) attracting nationally recognized scholars and faculty to the university b) stimulating an environment of the pursuit of knowledge and c) developing new funding opportunities for the university.

Coordination with Existing and Planned Programs

Coordination with existing and planned graduate programs is necessary to continue to grow a successful graduate environment on the campus. Based on our review, the Geosciences Department has successfully articulated the need for a doctoral degree program at BSU in Geosciences. The proposed doctoral program does not duplicate existing programs, but rather adds to the diversity of offerings within the Idaho system of higher education. The proposed doctoral program will foster additional cooperation and collaboration within the Idaho system and across the region. With the adoption of common graduate faculty status between BSU, the University of Idaho and Idaho State University, the External Program Review Team strongly encourages the participation of non-BSU faculty on graduate committees for the proposed doctoral program.

II. DETAILED ANALYSIS OF GEOSCIENCES QUALIFICATIONS

Faculty Expertise

The ERPT reviewed faculty vitae, faculty research projects and conducted interviews with both faculty and students of the Geosciences Department during our site visit. We conclude from this research that the Geosciences Department is fully capable to offer a nationally competitive doctoral program in earth sciences. The faculty are well respected in many areas of the geosciences, and also include several recent additions of young faculty already established as "up and coming" researchers.

Department Focus

The ERPT applauds the strategic directions that the Geosciences Department has taken in aligning its three primary "umbrella areas" of surface processes/hydrology, geophysics and structural geology/geochronology. While many geoscience departments have suffered in the past 10 years due to stagnation and enrollment decline, the BSU Geosciences Department has focused in key, emerging areas of geoscience and is poised to capitalize on new areas of research.

Demonstration of Need

The Program Proposal demonstrates sufficient need for advanced degrees in geosciences both within Idaho and regionally in the principal focus areas of the department faculty. Examples include locally housed federal agencies such as the U.S. Forest Service and U.S. Geological Survey, as well as the continued need for graduate geoscientists at the Idaho National Laboratory.

Infrastructure

The ERPT has reviewed the proposed curriculum and concludes it to be very appropriate and sufficient to support the doctoral program. No new courses are immediately needed to support the proposed doctoral program and therefore the program can be implemented without impact to the existing graduate degrees. However, the ERPT notes that additional teaching resources will need to be added to the Geosciences Department to reach a faculty teaching load appropriate for doctoral degree granting departments.

The ERPT further notes the need for additional office and research laboratory space to support the doctoral program, as well as the recommendation that a graduate program administrator position be developed to serve all graduate students in the department.

University Commitment

The ERPT interviewed BSU administrative staff and found strong support for the proposed degree. We believe that the level of administrative support and its continuity will be sufficient to ensure success of the degree.

Department Commitment

The ERPT was impressed by the strong commitment of faculty to the development and success of the proposed degree. The department has acted upon the recommendations of the 2001 department review, and this has successfully positioned the department to provide a high-quality graduate program in geosciences. The refocusing of the department along three emerging subdisciplines of geoscience has uniquely placed the department near the forefront of research in earth sciences. With the addition of a doctoral degree program, we are confident that the BSU Geosciences Department will become a regional, and potentially national, leader in geoscience research.

Demonstrated Abilities

The ERPT notes that the Geosciences Department has very successfully developed BSU's first doctoral program within the School of Arts and Sciences (Geophysics). The first cohort of doctoral candidates will be defending this year, and these students have or are about to publish their results in the top journals in the field. In addition, the Geosciences Department has successfully sustained research assistantships for these students throughout their academic careers, a critical component of any doctoral program. We also note that the MS in Geosciences degree program has grown significantly. The EPRT interviewed students in both degree programs who indicated overwhelming satisfaction with their advising, instruction and research project supervision.

III. PROGRAM CHALLENGES

University

The new doctoral program will immediately require new classrooms, laboratory and faculty office space and facilities. BSU also needs to enhance and expand its graduate student "culture," which is historically limited. Energy, innovation and cooperation are needed at all levels to create necessary student support for this program expansion. University should investigate viability of Graduate Student government, create social and educational opportunities for graduate students, work to expand student career services, investigate creation of endowed fellowship programs, and brainstorm the enhancement of student and faculty recognition in the form of awards, research grants, etc. There is also a need to continue to facilitate inter-university cooperation, ensuring that programs are complementary while meeting the needs of both the state and the region. This cooperation will help BSU achieve greater prominence in geosciences by harnessing the potential in several key areas. Within BSU, all should work to manage the growth of interdisciplinary degrees and programs, which will enhance the entire university in undertaking 21st century research and teaching.

College of Arts and Sciences

The College of Arts and Sciences should work to program new positions for lecturers, to maintain the quality of the undergraduate programs, while allowing growth and development of a graduate teaching base. College should also recognize the faculty workload impact of new graduate programs and the resulting disparity in teaching loads. College could investigate feasibility of release time, annotate faculty evaluations to recognize graduate teaching and research efforts, and provide incentives and rewards for faculty achieving higher levels of productivity and quality. College could also encourage faculty to be more entrepreneurial in securing extramural funding to help meet the strategic goals of the department. The College will need to identify adequate space to provide a healthy graduate student research environment, while concurrently developing a sense of a graduate student culture. The College could help plan and/or fund research and teaching seminars at the graduate level, encourage invitations of nationally prominent faculty to speak, conduct seminars. This strengthening of associated programs and departments will result in an enhanced and more collegial interdisciplinary environment at BSU, with associated departments of biology, mathematics, chemistry and CE.

Graduate School

The Graduate School should aggressively develop graduate fellowship programs, investigate provisions for graduate student bridge funding, creation of a career center, and assist with formation of a graduate student government. As new graduate programs come on-line, the Graduate School should help ensure that an adequate resource base for the existing graduate programs continues to grow.

The Graduate school can provide major assistance in building the visibility of BSU by supporting coordinated and aggressive recruiting efforts at both the Graduate School and Department levels.

Geosciences Department

The department needs to grow this new graduate program, and concurrently maintain strong undergraduate and masters programs, ensuring regularity of course offerings. It should also ensure the coordination of the graduate degree tracks across the Geosciences Department, including the existing Geophysics doctoral program and the proposed masters program in Hydrologic Sciences. This will enhance the across-the-board strengths in several aspects of earth sciences at BSU. The department should focus its strategic planning efforts, working to achieve a balance of focus areas and interdisciplinary opportunities. Department should pay particular attention to developing assessment and accountability tools for all of its graduate tracks, providing adequate faculty mentoring in this "young" department, and creation of space for teaching and research.

IV. RECOMMENDATIONS

As with the identification of challenges, we have broken out recommendations by the level at which they need to be addressed.

University

- To ensure success of graduate programs, particularly at the doctoral level, the university should give highest priority to development of coherent research and teaching space for the Department of Geosciences.
- In order to maintain high-quality undergraduate offerings while growing new graduate programs, the university should provide support for Lecturer positions to help reach a faculty teaching load appropriate for doctoral degree granting departments.
- Recognizing that mentorship is critical for junior faculty as it is for graduate students; the university should support senior hires to lead graduate program growth at campus level.
- As BSU moves toward graduate education, the university should re-examine what it considers to be its peer institutions.
- The university should strengthen its partnership with the Idaho National Laboratory at all levels in order to take full advantage of the mutual benefits for graduate education and workforce that such a partnership can provide.
- High priority should be given to creating endowed graduate fellowships in order to ensure long-term, consistent support for graduate education.
- The university should develop a strategic plan for bringing on new graduate programs to ensure a complementary suite of degrees consistent with BSU's mission.
- The university should facilitate collaboration with existing in-state and regional programs that have complementary objectives, providing a community of knowledge for graduate students to tap into as they pursue their degrees at BSU.
- In the fast-changing transition from print to digital media for scientific publishing, the university needs to strengthen digital capabilities and offerings of library services to ensure that graduate students have easy access to cutting-edge research results.

College of Arts and Sciences

- Long-term success of the Geosciences Ph.D. program depends on development of a graduate culture. We encourage the college to foster graduate student culture and support structure and to nurture graduate programs across the Sciences, consistent with BSU goals.
- In order to maximize research growth, the college should develop collaborative graduate programs with the College of Engineering.
- The college should support development of Lecturer faculty positions, beginning with Geosciences and growing to other departments as needed, as a necessary step to ensure appropriate teaching loads for faculty participating in doctoral education.
- Encourage departments to exchange faculty on search committees to ensure complementary new hires that will foster interdisciplinary opportunities for graduate students.

Graduate School

- For doctoral programs to be successful, retention is critical. The graduate school can contribute by growing a graduate student support structure, including:
  - Career services for graduate students;
  - A competitive research grant fund;
  - Bridge funding mechanism to provide greater certainty of support; and
  - Growing programs such as Graduate Residential Scholars to attract and retain top students.
- Develop modern graduate faculty criteria, with attention to involving affiliated professionals such as Idaho National Laboratory.

Geosciences Department

The committee makes a number of detailed suggestions for the Department of Geosciences specifically related to the proposal:

- Clearly identify examples of how the proposed program will enhance undergraduate education and existing MS programs.
- Strengthen discussion of assessment.
- Proposal should include plans for student mentoring to ensure success with examples from existing Geophysics Ph.D. and departmental MS programs.
- Incorporate resource requests in the budget for a Graduate Program Administrator and Lecturer positions.
- Document successes and relevant experiences with existing doctoral program.
- Emphasize how the new program is complementary to existing degrees offered in the state and regionally.

In addition, we recommend the following broader recommendations for long-term enhancement of the proposed doctoral program:

- We encourage the department to include "outside" faculty participation on all supervisory committees in addition to the outside participation at the dissertation defense. Involving external faculty throughout students' graduate experience will help to involve them in a broader community of scholars and prepare them for entering the workforce.
- To enhance mentoring and retention of existing faculty, the department should consider mid-career faculty appointments to enhance mentoring and retention of existing faculty. One of the strengths of this department is the number of early career faculty involved in exciting research, and this recommendation is geared toward sustaining that strength.
- The department should continue to support development of a strong graduate student culture within the department. The committee applauds the department for its existing approach to including students in decision making and encourages adding participation of students on faculty search committees.
- The department should consider the development of a recruiting "weekend" to bring all prospective graduate students to campus.
- The department's current first-semester orientation course should be required for all departmental graduate students in both MS and Ph.D. programs. In addition, the department should consider developing core courses for each of the degree tracks to further generate a sense of graduate student community from the start.
- The department should develop a single Graduate Program Administrator for all graduate tracks with emphasis on recruitment, retention and assessment.
- As recommended for the university, the department should identify appropriate peer departments with consideration for not only where the department is at present but where it plans to be in the future. The committee does not necessarily expect the list of peer departments to overlap with the university's peer institutions.
- In order to facilitate effective advising, the department should develop a five-year course offering plan.

Boise State Response to the External Program Review Report

We appreciate the significant time and effort invested by the members of the External Review Team in their careful evaluation of Boise State's proposal for a new Ph.D. program in Geosciences and its context in the department, college and university. In the **Program Review Report**, the reviewers issued a strong endorsement of the proposed Ph.D. program. In addition, the team highlighted several challenges and made a number of specific recommendations to ensure its long-term success, keyed to four administrative units with oversight of the proposed program: (1) the University central administration; (2) the College of Arts & Sciences; (3) the Graduate College; and (4) the Department of Geosciences. Recommendations of the external review team to each are reviewed and discussed briefly below.

RECOMMENDATIONS

To the University:

- *To ensure success of graduate programs, particularly at the doctoral level, the university should give highest priority to development of coherent research and teaching space for the Department of Geosciences.*

Response: A new interactive teaching and learning center is under construction adjacent to the Math-Geology building and will greatly increase convenient access to modern teaching space by the Department of Geosciences. In addition, the university has recently improved its processes for evaluating facilities needs and has placed a top priority on adding research space for scientists and engineers.

- *In order to maintain high-quality undergraduate offerings while growing new graduate programs, the university should provide support for Lecturer positions to help reach a faculty teaching load appropriate for doctoral degree granting departments.*

Response: Boise State recognizes the need to insure the on-going delivery of a high-quality undergraduate curriculum as we simultaneously add new research-intensive graduate programs. We agree that one potential way to help with this issue is to support Lecturer positions in departments with active, research-intensive graduate programs. A plan for such positions is currently being developed and discussed.

- *Recognizing that mentorship is critical for junior faculty as it is for graduate students, the university should support senior hires to lead graduate program growth at campus level*

Response: Boise State has hired faculty at a senior level in the past and remains open to doing so for future positions. Excellence will remain the prime consideration for faculty hires; but the university recognizes the value of adding senior personnel when opportunities to do so are available.

- *As BSU moves toward graduate education, the university should re-examine what it considers to be its peer institutions.*

Response: Boise State University is growing and maturing into a metropolitan research university. During this transition, the university will review and up-date its list of peer institutions on a regular basis to maintain an appropriate basis for comparison. In addition, individual departments are encouraged to identify peer departments at other universities that better fit departmental aspirations.

- *The university should strengthen its partnership with the Idaho National Laboratory at all levels in order to take full advantage of the mutual benefits for graduate education and workforce that such a partnership can provide.*

Response: Boise State has begun to develop a number of active partnerships and collaborations with the Idaho National Laboratory (INL), and we anticipate this activity will increase in the future as the research enterprise of the university expands along with its graduate programs. In particular, Boise State is an active member of the Center for Advanced Energy Studies, which is the organization that provides the principal interface between the INL and the Idaho universities.

- *High priority should be given to creating endowed graduate fellowships in order to ensure long-term, consistent support for graduate education.*

Response: The university is currently planning a comprehensive campaign, and endowed graduate fellowships will be an area of emphasis for prospective donors.

- *The university should develop a strategic plan for bringing on new graduate programs to ensure a complementary suite of degrees consistent with BSU's mission.*

Response: As required by the Idaho State Board of Education (SBOE), Boise State has included in the state-wide eight-year academic plan targeted graduate program growth that is reviewed and up-dated regularly (and approved by the SBOE). The plan is designed to address the needs of the community and region, fulfill the role and mission of the university, and build on the emerging strengths of the university.

- *The university should facilitate collaboration with existing in-state and regional programs that have complementary objectives, providing a community of knowledge for graduate students to tap into as they pursue their degrees at BSU.*

Response: Building a larger, more connected community of knowledge within Idaho and the region is important, and Boise State is interested in working with our partner institutions to further this goal. At the graduate level, the primary goal is to promote the sharing of graduate courses by distance methods, and to encourage service by graduate faculty on supervisory committees at other universities. For example, Boise State has played a lead role in the development of the INRA subsurface science graduate program, which is a vehicle for the collaborative creation and delivery of interdisciplinary graduate courses to the eight INRA universities. Specifically within Geology/Geosciences, the departments in all three Idaho universities have a history of positive, collaborative activities ranging from writing proposals together for extramural funding, to participation in student thesis committees, to organizing national, community-wide geosciences efforts like cyberinfrastructure development.

- *In the fast-changing transition from print to digital media for scientific publishing, the university needs to strengthen digital capabilities and offerings of library services to ensure that graduate students have easy access to cutting-edge research results.*

Response: The university recognizes the critical role of digital media and library resources in general in supporting active research and graduate academic programs. Boise State is a member of a consortium of universities in the Northwest region which allows access to many on-line journals, and our stand alone journal subscriptions are transitioning more and more to on-line format. The university will continue to build and invest in this important resource, and recently added the Web of Science to its digital holdings. A new library dean with an extensive background at a major research university has been recruited to assist with this effort (pending SBOE approval).

To the College of Arts & Sciences:

- *Long-term success of the Geosciences Ph.D. program depends on development of a graduate culture. We encourage the college to foster graduate student culture and support structure and to nurture graduate programs across the Sciences, consistent with BSU goals.*

Response: The college and university are committed to fostering graduate culture at Boise State University, and to providing the resources – funding, personnel, and space – necessary to accomplish this goal. At the college level, we will facilitate a discussion among departments with graduate programs to identify the best mechanisms to enhance graduate culture. We will then implement these as part of the college strategic plan. One recent – and highly successful – addition to the support for graduate culture at Boise State University is the *Graduate Residential Scholar Program*. Graduate students who receive admission to this program are provided with on-campus housing in a group environment which fosters day-to-day interaction and the building of relationships among graduate students from different departments and cultures.

- *In order to maximize research growth, the college should develop collaborative graduate programs with the College of Engineering.*

Response: We agree that interdisciplinary, collaborative graduate programs with Engineering are important. In fact, some collaborative programs already exist and others are being planned for the near future. For example, existing programs in Materials Science and Engineering (BS and MS) were established as partnerships between the College of Engineering and the departments of physics and chemistry in the College of Arts & Sciences. Also, the 8-year academic plan includes an MS in Bioinformatics, which will involve Engineering, Math, and Biology. With regard to the proposed PhD in Geosciences, participation of faculty from Civil Engineering and Material Science & Engineering on the Supervisory Committees of students will be encouraged when thesis research topics are appropriate (as is currently done with the PhD in Geophysics).

- *The college should support development of Lecturer faculty positions, beginning with Geosciences and growing to other departments as needed, as a necessary step to ensure appropriate teaching loads for faculty participating in doctoral education.*

Response: The College supports this concept and is already working within the university to develop a plan for Lecturer positions.

- *Encourage departments to exchange faculty on search committees to ensure complementary new hires that will foster interdisciplinary opportunities for graduate students.*

Response: Providing interdisciplinary opportunities for graduate student research and curriculum development is important, and interdisciplinary input on faculty hires is one way to encourage this process. Historically, this has happened on a regular basis between departments with high potential for research and academic collaborations. Examples include recent hires of a biophysicist in the Physics Department (with input from Biology) and a biochemist in the Biology Department (with input from Chemistry). The leadership of the College of Arts & Sciences will continue to encourage this type of exchange of perspective on faculty hires in the future.

To the Graduate College:

- *For doctoral programs to be successful, retention is critical. The graduate school can contribute by growing a graduate student support structure, including:*
  - *Career services for graduate students;*
  - *A competitive research grant fund;*
  - *Bridge funding mechanism to provide greater certainty of support; and*
  - *Growing programs such as Graduate Residential Scholars to attract and retain top students.*

Response: The Graduate College agrees that retention is an important factor in the success of graduate programs, and the college has a central role in creating graduate student support structures for the university. The Graduate

College has implemented programs like the *Graduate Residential Scholars Program* to aid student retention and the development of graduate culture within the university. Over the next several years, the Graduate College will be implementing enhanced graduate recruiting assistance, a matching program to encourage external funding of graduate assistantships with an emphasis on summer support, and an examination of the university career services center to see how it can be more effective in working with graduate students.

- *Develop modern graduate faculty criteria, with attention to involving affiliated professionals such as Idaho National Laboratory.*

Response: The ability to draw on appropriate professional expertise in the community, and particularly at the Idaho National Laboratory, adds strength and depth to the pool of potential graduate faculty, and generates a valuable resource for graduate students. The current system of graduate faculty achieves this via appointment to the Adjunct Graduate Faculty, which allows participation of non-Boise State personnel in supervisory committees and other graduate faculty functions as needed and appropriate. The graduate regulations that govern participation on supervisory committees, and in particular the leadership of such committees by young graduate faculty or adjunct graduate faculty, are under examination by the Graduate Council.

To the Geosciences Department:

All specific suggestions of the external review team that were related to the content of the proposal document have been implemented in the current, final draft. In addition, the external reviewers made eight broader recommendations to the department for long-term enhancement of the proposed doctoral program:

(1) We encourage the department to include "outside" faculty participation on all supervisory committees in addition to the outside participation at the dissertation defense. Involving external faculty throughout students' graduate experience will help to involve them in a broader community of scholars and prepare them for entering the workforce.

Response: The department agrees that external participation on supervisory committees is often of significant benefit to students. In fact, the culture of the department encourages the participation of "outside" faculty in the supervisory committees of students in our existing graduate programs, and many committees include such faculty. Looking ahead, we anticipate that participation of outside faculty in committees for the proposed PhD program will be common.

(2) To enhance mentoring and retention of existing faculty, the department should consider mid-career faculty appointments to enhance mentoring and retention of existing faculty. One of the strengths of this department is the number of early career faculty involved in exciting research, and this recommendation is geared toward sustaining that strength.

Response: As recommended, the department will consider recruiting mid-career scientists to fill future tenure-track faculty positions (new or retirement replacement) to facilitate mentoring of our numerous younger faculty. This would help to smooth the age demographic of the department and provide a broader spectrum of professional perspectives to enrich the departmental culture.

(3) The department should continue to support development of a strong graduate student culture within the department. The committee applauds the department for its existing approach to including students in decision making and encourages adding participation of students on faculty search committees.

Response: Graduate student representatives will be formally appointed as members of faculty search committees in the future. The department has always asked for input from the graduate students and weighed their perspective when considering faculty appointments; however, formal representation will give them a clearer voice in the process and a stronger sense of ownership in the department.

(4) The department should consider the development of a recruiting "weekend" to bring all prospective graduate students to campus.

Response: The department regards this as an excellent suggestion – part of our recruiting plan has been to bring prospective Ph.D. students to campus; a recruiting weekend would allow us to be more efficient and effective with the time and other resources associated with this effort. Organization of the recruiting activities will be one of the tasks assigned to the Director of Academic Programs, a new departmental staff position the review team has recommended we make a priority of adding (as discussed below).

(5) The department's current first-semester orientation course should be required for all departmental graduate students in both MS and Ph.D. programs. In addition, the department should consider developing core courses for each of the degree tracks to further generate a sense of graduate student community from the start.

Response: We agree – Beginning with the Fall 06 semester, new graduate students in all graduate programs offered through the department will be required to take the Graduate Orientation class currently required of only the MS Geology students. This class will help us to build a stronger sense of graduate community across all of the disciplines in the department and provide a consistent mechanism to help students transition successfully into their programs.

(6) The department should develop a single Graduate Program Administrator for all graduate tracks with emphasis on recruitment, retention and assessment.

Response: Consistent with this recommendation, the program plan now includes a new 'Director of Academic Programs' staff position which (among other functions) will organize and implement a comprehensive suite of recruitment, retention, and assessment activities for the graduate programs within the department.

(7) As recommended for the university, the department should identify appropriate peer departments with consideration for not only where the department is at present but where it plans to be in the future. The committee does not necessarily expect the list of peer departments to overlap with the university's peer institutions.

Response: The department will begin immediately the process of finding departments regionally and nationally to be included in a peer group. The final peer group will be identified by the end of the Fall 2006 semester and form a benchmark to be used in subsequent program assessments.

(8) In order to facilitate effective advising, the department should develop a five-year course offering plan.

Response: The department is currently developing a five-year plan of its course offerings, and it will be made available as a planning and advising tool beginning with the Fall 2006 semester. The plan will be evaluated and up-dated on an annual basis.

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
IDAHO WATER SCIENCE CENTER
230 Collins Road
Boise, Idaho 83702-4520

September 7, 2005

Dr. Clyde J. Northrup
Associate Professor and Chair
Department of Geosciences
Boise State University
1910 University Drive
Boise, ID 83725 – 1535

Dear Dr. Northrup:

The USGS has benefited in many ways by having access to the education and research resources of the University community in Boise. Several of our scientists have received their degrees from your department at Boise State University, for example. Our recruitment efforts now target scientists pursuing graduate degrees because we expect our new employees to already have experience in several areas. We expect them to understand the communities need for water-resources science and information. They need to know how to design a scientifically defensible approach to answer the community's water-resources related questions. They need to have the skills to manage a scientific investigation. They must be able to document and communicate the outcomes of those investigations to the people who need the information.

We are not the only organization in Idaho with these expectations. Though undergraduate programs lay the foundation for a career in science, students develop the depth needed to be fully effective through advanced graduate programs, such as the proposed Boise State University Doctorate of Philosophy in Geosciences program. These students bring to the USGS, and other employers, an up-to-date understanding of the state of research in their chosen specialty and they have the combination of skills that enable us to provide geosciences for the public good.

Strong university science programs in Boise are an asset that has helped us recruit scientists and engineers to the USGS Idaho Science Center. In turn, I encourage our scientists and engineers to support the universities by mentoring students, collaborating with faculty, and serving as adjunct professors. As you know, these personal relationships benefit both the educational scientific community and the governmental scientific community by stimulating creative approaches to provide the information needed for the development, management, and protection of the water resources of Idaho.

Please keep me informed of the progress of the proposed degree program.

The scientists of the USGS Idaho Science Center and I look forward to continuing collaboration,

Kathy D. Peter, P.E.
Director

August 26, 2005

CCN 202382

C. J. Northrup, Ph.D.
Chair, Department of Geosciences
Boise State University
1910 University Drive
Boise, ID 83725-1535

SUBJECT: Proposed New Ph.D. in Geosciences at Boise State University

Dear Dr. Northrup:

I am writing in support of Boise State University's proposal for a new Ph.D. program in Geosciences. As you know, the Idaho National Laboratory (INL) has actively engaged Boise State to develop stronger collaborative and cooperative ties in several areas, including the geosciences, with the objective of creating new research opportunities, enhancing higher education in the state, and creating new economic opportunities in Idaho. The proposed new Ph.D. program at Boise State would be a welcome addition and help to provide the foundation for increased collaborative research activities between INL and the university.

The economy and quality of life in southern Idaho will be impacted in the next decade by a number of critical challenges requiring new, innovative geoscience research to manage successfully. Two specific examples that come to mind are the geochemistry of arsenic in the groundwater system of southern Idaho (next year, 130 Idaho community water systems will exceed the new federal groundwater standard for arsenic) and the growing regional need for enhanced geothermal energy exploration and management technologies. Research directed at both of these topics (and others) will come from the new Ph.D. program at Boise State and will form part of the research connection we envision between Boise State and the INL. Both institutions have ideas and talent to bring to bear on such problems. While INL is strong in scientific talent and has sophisticated equipment of potential use in solving state problems, it is difficult to project that talent around the state. Collaboration with Boise State's new Ph.D. program would provide a mechanism for doing so, and simultaneously help to generate the specialized, technically capable workforce needed by agencies and industries in the future.

In summary, Boise State has thoughtfully advanced a plan for a new Ph.D. program in Geosciences that will contribute to the education of our citizens and the advancement of our economy. We strongly

endorse the new program, and look forward to building effective collaborative ties with the university based in part on the presence of this program.

Sincerely,

J. W. Rogers, Ph.D., Associate Laboratory Director
Science and Technology

MDA:pgs

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P O BOX 27 BOISE, IDAHO 83707-0027 (208) 336-2110 FAX (208) 369-7515

CORPORATE HEADQUARTERS

October 25, 2005

Dr. C.J. Northrop
Associate Professor
Chairperson, Department of Geosciences
Boise State University
1910 University Drive
Boise, ID 83725-1535

Dear Dr. Northrop:

Please consider this letter as my complete and full endorsement of the Boise State University Department of Geosciences proposed Doctoral Program in the Geosciences. The state of Idaho is benefited by having three quality universities with geoscience faculty and programs of high repute. This proposed academic addition will complement and extend the attractiveness of the state's geoscience efforts to more students, serious researchers, funding sources, state-federal-private technology partnerships and information upon which business and political decisions will be made.

Research done by university geoscience professors and graduate students often has global implications derived initially from local and regional areas of research located within a reasonable circumference of commute to the main campus. All of our three universities and the Idaho Geological Survey geoscience programs have professors and students doing significant research in Idaho and surrounding states that have an informational importance to a better understanding of Idaho's geologic and geophysical profile. This research has implications to our understanding of mineral, oil and gas, and geothermal potential as well as geologic hazards, building site stability, actual and potential ground and surface water resources, the movement of the same and the capacity for environmental degradation.

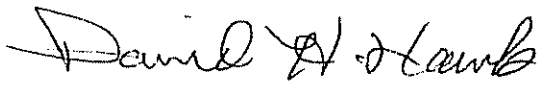
In comparison to many other states, Idaho has been lightly mapped and the above issues fully analyzed in localized detail. Our number of researchers and funding have not allowed the truly quality works we have seen to be as expansive as that necessary to make the land use and resource decisions that political, industrial, developer, and environmental groups are having to make. Researchers, professors, PhD students and associated masters candidates will through their works, yield research that guarantees greater capacity for accurate policy decision making. Due to budget cuts and status quo funding for the Department of Energy and United States Geological Survey programs, Idaho cannot expect additional significant federal research to assist in obtaining the above described requisite knowledge unless specific researchers are already engaged in these areas.

Idaho is a natural laboratory for the study of geology, geophysics and geography. The works of the BSU, PhD program would not be duplicative but rather complementary to that of the University of Idaho and Idaho State University. Boise State is publicly committed to continuing the high quality of their undergraduate and masters degree geosciences programs. They will be even more competitive, as they always have for grants and research funding. They will ultimately provide a quality resource cooperating with and complementing the role and mission of the Idaho Geological Survey.

The BSU Geosciences Department is one of the universities most respected areas of excellence, recognized statewide and nationally. Our nation is short of geoscientists. This program expansion because of the departments reputation, current research emphasis, and location will bring more applications for all degree levels than the department can handle; a wonderful position for the state of Idaho.

I have practiced geology and used my geologic skills in Idaho for over 30 years. I have been president of the Idaho Association of Professional Geologists and have represented three governors on the Idaho Geological Survey Advisory Board for the last 18 years. This normal growth for BSU to a Geoscience Doctorate of Philosophy granting institution will only yield positive results for Idaho and further national acclaim. If I can be of any assistance in the deliberations of the Boise State University Administration and / or the Idaho State Board of Education please do not hesitate to contact me.

Very Truly Yours,



David H. Hawk
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SUBJECT

Executive Master of Business Administration (EMBA) – Boise State University

APPLICABLE STATUTE, RULE, OR POLICY

- Idaho State Board of Education Governing Policies and Procedures, Section III.G.4 and 5, Program Approval and Discontinuance
- Sections 33-107 (7), 33-4001. Idaho Code.

BACKGROUND

In accordance with Board policy III.G.4.(a) (1), Board approval is required prior to implementation of any new academic program, instructional unit, minor, option, or emphasis with a financial impact of $250,000 or more per year. In accordance with Board Policy III.G.4, (a) (2), the Executive Director is authorized to approve, prior to implementation, any new academic program, instructional unit, minor, option, or emphasis with a financial impact of less than $250,000 per year.

DISCUSSION

Boise State University (BSU) proposes to expand its existing Master of Business Administration program (MBA) with the addition of an Executive MBA (EMBA) track. The proposed EMBA program is unlike the existing MBA program in that both the student population and the delivery method are different. The EMBA program is designed around the educational needs of employed professionals with considerable mid-level or higher business management experience; BSU's existing program requires only two years of work experience. The existing program enables students to select courses at night on an ad hoc basis. The Executive MBA program requires nearly two years of cohort-based learning so that executives can finish in a reasonable period of time and learn with their peers. The EMBA program will require 40 credits (about the same as the existing program) and leads to the Master of Business Administration (M.B.A.) degree.

Area organizations were contacted to measure interest. This process resulted in formal written notifications from eight organizations (Albertsons, Hewlett-Packard, IdaCorp, Micron Technology, J.R. Simplot Corporation, Smoky Mountain Pizza and Pasta, Woodgrain Millwork, and the Idaho Department of Health and Welfare) of their intention to participate. Each organization has reserved as many as four seats in the first cohort, with a total reservation of 16-23 seats committed for the program slated to start in September 2006.

In addition, a research project provided estimates of annual demand and overall market size. Projecting national averages into the local market suggests 55-80 executive MBA degrees could be awarded in the Treasure Valley each year with an estimated total pool of about 3400 candidates.

The following measures will ensure the high quality of the proposed program:
Regional Institutional Accreditation: Boise State University is regionally accredited by the Northwest Commission on Colleges and Universities (NWCCU). Regional accreditation of the university has been continuous since initial accreditation was conferred in 1941. Boise State University is currently accredited at all degree levels (A, B, M, D).

Specialized Accreditation: All undergraduate and graduate business and accounting programs in the College of Business and Economics are accredited under the Association to Advance Collegiate Schools of Business (AACSB) International. Fewer than 15% of the world's business schools have been able to achieve AACSB accreditation.

Curriculum Design: The curriculum conforms to modern standards in graduate business education, and is based on a unique partnership between Boise State University and numerous Treasure Valley organizations, including the largest private employers in Idaho. The collective wisdom of the partners is integrated into an innovative, application-oriented learning environment that emphasizes global perspectives, participation by outside experts, and individualized leadership development. A project is required as the culminating activity.

Program Review: Internal program evaluations will take place every five years as part of the normal review process conducted by the Office of the Provost. This process requires a detailed self study (including outcome assessments), and a comprehensive review and site visit by external evaluators.

Other: The programs will adhere to all policies and procedures of the Graduate College which is assigned broad institutional oversight of all graduate degree and certificate programs.

The proposed EMBA program does not duplicate any program offered by the Idaho public system of higher education or by the private colleges and universities in Idaho. In surrounding states, EMBA programs can be found in Seattle, Washington; Portland, Oregon; Las Vegas, Nevada; and Salt Lake City, Utah. None of those programs are based on the business partnership model being proposed.

The EMBA program will be delivered as a completely self-supporting program. The lump sum fee for the entire program is $38,000 per participant. This fee covers all instruction, pre-program tutorial software, textbooks, course materials, course-specific software, a residency week in Mexico working with international peers, participation by outside experts, lunches, and break snacks and beverages. In most cases, the program fee is paid in full or in large part by company sponsorship of participants.

Boise State University faculty members are expected to teach the majority of the program's courses as an overload or as part of load. However, qualified faculty from other universities or the public and the private sector may also be employed to do so. The modular curriculum design spreads the instruction burden by enabling most faculty members to participate only in areas of existing expertise rather than carrying the burden of an entire course.

Program oversight will be provided by the Associate Dean for Graduate Studies and Executive Education as part of his/her regular duties. Administrative staff support will be funded from program revenues.

Fiscal Impact

The figures below are based on a first cohort of 30 participants (the first cohort steps through the program in FY07 and FY08) with a 10% fee increase implemented for the second cohort (the second cohort starts in FY09).

Estimated Fiscal Impact	FY 07	FY 08	FY 09	Total
A. Expenditures				
1. Personnel	390,000	390,000	429,000	1,209,000
2. Operating	180,000	180,000	198,000	558,000
3. Capital Outlay	0	0	0	0
4. Facilities	0	0	0	0
TOTAL:	570,000	570,000	627,000	1,767,000
B. Source of Funds				
1. Appropriated Reallocation	0	0	0	0
2. Appropriated – New	0	0	0	0
3. Federal	0	0	0	0
4. Other (tuition/fees)	570,000	570,000	627,000	1,767,000
TOTAL:	570,000	570,000	627,000	1,767,000
C. Nature of Funds				
1. Recurring *	0	0	0	0
2. Non-recurring **	570,000	570,000	627,000	1,767,000
TOTAL:	570,000	570,000	627,000	1,767,000

IMPACT

If Board approved, the institution will implement this program and it will be subject to future monitoring for program compliance.

STAFF COMMENTS AND RECOMMENDATIONS

BSU's request to offer an Executive Master of Business Administration is consistent with their Eight-Year Plan for Delivery of Academic Programs in the Southwest Region. Board staff and CAAP recommend approval as presented.

BOARD ACTION

A motion to approve Boise State University's request to offer an Executive Master of Business Administration (EMBA) program.

Moved by_____ Seconded by_____ Carried Yes_____ No_____

REFERENCE: APPLICABLE STATUTE, RULE, OR POLICY

Idaho State Board of Education
GOVERNING POLICIES AND PROCEDURES
SECTION: III. POSTSECONDARY AFFAIRS
G. Program Approval and Discontinuance **October 2002**

4. Program Approval Policy

Program approval will take into consideration statewide and institutional objectives.

a. New instructional programs, instructional units, majors, minors, options, and emphases require approval prior to implementation;

(1) Board Approval – Board approval prior to implementation is required for any new:
(a) professional-technical program,
(b) academic program leading to a master's, specialist or doctoral degree,
(c) major,
(d) academic program, instructional unit, minor, option, or emphasis with a financial impact* of $250,000 or more per year

(2) Executive Director Approval – Executive Director approval prior to implementation is required for any new academic program, instructional unit, minor, option, or emphasis with a financial impact of less than $250,000 per year

b. Existing instructional programs, majors, minors, options, emphases and instructional units.

(1) Changes, additions, expansions, and consolidations to existing instructional programs, majors, minors, options, emphases, or instructional units with a financial impact of $250,000 or more per year require Board approval prior to implementation.

(2) Changes, additions, expansions, and consolidations to existing instructional programs, majors, minors, options, emphases or instructional units with a financial impact of less than $250,000 require executive director approval prior to implementation. The executive director may refer any of the requests to the Board or a subcommittee of the Board for review and action. All modifications approved by the executive director shall be reported quarterly to the Board. Non-substantive name or title changes need not be submitted for approval.

c. Routine Changes

Non-substantive name or title changes, credits, descriptions of individual courses, or other routine catalog changes do not require notification or approval.

5. Approval Procedures

a. Board Approval Procedures

(1) Subsequent to institutional review and consistent with institutional policies, all requests requiring Board approval will be submitted by the institution as a notice of intent in a manner prescribed by the Chief Academic Officer of the Board.

(2) The Chief Academic Officer shall forward the request to the CAAP for its review and recommendation. Professional-technical requests will be forwarded to the Idaho Division of Professional-Technical Education for review and recommendation prior to CAAP review and action. If the CAAP recommends approval, the proposal shall be forwarded to the Board for action. Requests that require new state appropriations will be included in the annual budget request of the institution and the State Board of Education.

(3) CAAP may, at its discretion, request a full proposal for any request requiring a notice of intent. A request for a new graduate program requires a full proposal. Full proposals should be forwarded to CAAP members at least two (2) weeks prior to the CAAP meeting.

(4) As a part of the full proposal process, all doctoral program request(s) will require an external peer review. The external peer-review panel will consist of at least two (2) members and will be selected by the Board's Chief Academic Officer and the requesting institution's Chief Academic Officer. The review will consist of a paper and on-site review followed by the issuance of a report and recommendations by the peer-review panel. Considerable weight on the approval process will be placed upon the peer reviewer's report and recommendations.

b. Office of the State Board of Education Approval Procedures

(1) All requests requiring approval by the Executive Director will be submitted by the institution as a notice of intent in a manner prescribed by the Chief Academic Officer of the Board. At his discretion, the Chief Academic Officer shall forward the request to the CAAP for review and recommendation. Professional-technical requests will be forwarded to the Division of Professional-Technical Education for review and recommendation prior to CAAP review and action.

(2) If the CAAP recommends approval of the request(s), the notice of intent will be submitted to the Executive Director for consideration and action. The Executive Director shall act on any request within thirty (30) days of receipt of the CAAP recommendation.

(3) If the Executive Director denies the request he or she shall provide specific reasons in writing. The institution has thirty (30) days in which to address the

issue(s) for denial of the request. The Executive Director has ten (10) working days after the receipt of the institution's response to reconsider the denial. If the Executive Director decides to deny the request after re-consideration, the institution may send its request and the documents related to the denial to the president of the Board for final reconsideration.

(4) Distance Learning Delivery and Residence Centers

All academic programs delivered to sites outside of the service area defined by the institution's role and mission statement shall be submitted to the Executive Director using a notice of intent.

REFERENCE: APPLICABLE STATUTE, RULE, OR POLICY

TITLE 33
EDUCATION
CHAPTER 1
STATE BOARD OF EDUCATION

33-107. GENERAL POWERS AND DUTIES OF THE STATE BOARD. The state board shall have power to:

(7) prescribe the courses and programs of study to be offered at the public institutions of higher education, after consultation with the presidents of the affected institutions;

TITLE 33
EDUCATION
CHAPTER 40
BOISE STATE UNIVERSITY

33-4001. BOISE STATE UNIVERSITY ESTABLISHED -- STANDARDS -- PROFESSIONAL-TECHNICAL PROGRAMS. The college now known as Boise state college and previously operated and conducted by Boise community college district in Ada County, Idaho, known as Boise college, shall be established in the city of Boise, Idaho, as an institution of higher education of the state of Idaho, for the purpose of giving instruction in college courses in sciences, arts and literature, professional, technical and other courses of higher education, such courses being those that are usually included in colleges and universities leading to the granting of appropriate collegiate degrees, said college to be known as Boise State University. The standards of the courses and departments maintained in said university shall be at least equal to, or on a parity with those maintained in other similar colleges and universities in Idaho and other states. All programs in the professional-technical departments, including terminal programs now established and maintained, may be continued and such additional professional-technical and terminal programs may be added as the needs of the students attending such university taking professional-technical and terminal programs shall warrant, and the appropriate certificate for completion thereof shall be granted. The courses offered and degrees granted at said university shall be determined by the board of trustees.

SUBJECT

Experimental Program to Stimulate Competitive Research (EPSCoR) Board Appointments

APPLICABLE STATUTE, RULE, OR POLICY

N/A

BACKGROUND

Experimental Program to Stimulate Competitive Research (EPSCoR) in Idaho represents a federal-state partnership to enhance the science and engineering research, education, and technology capabilities of states that traditionally have received smaller amounts of federal R&D funds. Through EPSCoR, participating states are building a high-quality, academic research base that is serving as a backbone of a scientific and technological (S&T) enterprise.

Idaho EPSCoR is led by a state committee composed of 16 members with diverse professional backgrounds from both the public and private sectors and from all regions of the state. The state committee reports to the State Board of Education via the Higher Education Research Council (HERC). The Idaho EPSCoR office and the State of Idaho EPSCoR Project Director are located at the University of Idaho, and partner institutions are Boise State University and Idaho State University (this information was obtained from EPSCoR website supported by the NSF-Idaho EPSCoR Program and by the National Science Foundation under award number EPS-0132626)

DISCUSSION

On November 1, 2005, the Idaho EPSCoR Committee forwarded their recommendation to reappoint seven individuals to the committee and to appoint a new member. Prior to reappointing members, the Board would like to invite the EPSCoR Project Director to provide a report at the April Board meeting in response to items listed below. The Board also plans to seek nominations from Idaho State University, Boise State University, Idaho National Laboratory, and other Board members.

Materials relating to Idaho's EPSCoR Committee should be prepared and presented to the Idaho State Board of Education and the Board of Regents for the University of Idaho at the April 20-21, 2006 Board meeting in Moscow, Idaho. The materials should include:

- Founding charter or policy which created Idaho's EPSCoR committee
- Membership: categories, length of terms, qualifications; guidelines, nomination process, funding etc.
- Historical and current data relating to funded projects (which institution received how much and when; accountability measures)
- Copies of policies and procedures for Idaho EPSCoR (job descriptions for EPSCoR project director and staff)

- Strategic plan for EPSCoR (future enhancements such as online applications, tracking system, shared services of a research foundation, etc.)
- Schedule for EPSCoR (Idaho and national) meetings in 2006-07

IMPACT

This action will delay the reappointment of existing members and the appointment of a new member to the EPSCoR Committee

STAFF COMMENTS AND RECOMMENDATIONS

Staff recommends delaying the reappointments and the new appointment until the Board has reviewed materials submitted by the EPSCoR Committee at the April board meeting.

MOTION

A motion to delay the reappointments and the new appointment to the Idaho EPSCoR Committee and to direct the Idaho EPSCoR Committee to work with Board staff in an effort to gather the materials outlined in the Discussion section of agenda for Board review.

Moved by_____ Seconded by_____ Carried Yes_____ No_____

SUBJECT

Presentation by Canyon Owyhee School Service Agency (COSSA)

APPLICABLE STATUTE, RULE, OR POLICY

Section 33-317, Idaho Code. Cooperative Service Agency – Powers – Duties Limitations.

BACKGROUND

The intention of this presentation is to provide an overview of COSSA consortium and discuss the advantages this program provides to the small school districts who are a part of the consortium.

DISCUSSION

Specifically, this presentation will provide the Board with:

- The annual number of students served by the consortium's Programs
- Documentation of the cost savings of providing these programs through a consortium
- Current needs of the consortium

IMPACT

N/A

STAFF COMMENTS AND RECOMMENDATIONS

Staff has no comments or recommendations.

BOARD ACTION

This item is for informational purposes only. Any action will be at the Board's discretion.

REFERENCE: APPLICABLE STATUTE, RULE, OR POLICY

TITLE 33
EDUCATION
CHAPTER 3
SCHOOL DISTRICTS

33-317. COOPERATIVE SERVICE AGENCY -- POWERS -- DUTIES LIMITATIONS.

Two (2) or more school districts may join together for educational purposes to form a service agency to purchase materials and/or provide services for use individually or in combination. The cooperative service agency thus formed shall be empowered to adopt by-laws, and act as a body corporate and politic with such powers as are assigned through its by-laws but limited to the powers and duties of local school districts. In its corporate capacity, this agency may sue and be sued and may acquire, hold and convey real and personal property necessary to its existence. The employees of the service agency shall be extended the same general rights, privileges and responsibilities as comparable employees of a school district.

A properly constituted cooperative service agency may request from its member school districts funding to be furnished by a tax levy not to exceed one-tenth of one percent (.1%) for a period not to exceed ten (10) years by such member school districts. Such levy must be authorized by an election held in each of the school districts pursuant to chapter 4, title 33, Idaho Code, and approved by a majority of the district electors voting in such election. Moneys received by the member school districts from this source shall be transferred to the cooperative service agency upon receipt of billing from the agency. Excess revenue over billing must be kept in a designated account by the district, with accrued interest, and may only be spent as budgeted by the agency.

SUBJECT

Improving Practical Financial Education Programs in Idaho Schools

APPLICABLE STATUTE, RULE, OR POLICY

References to this issue are currently found in achievement standards for Grades 9-12. IDAPA Rules Governing Thoroughness 08.02.03.510.01 Fundamentals, 08.02.03.513.01 Economic Institutions, 08.02.03.514.01 Personal Finance, 08.02.03.347.01 Basic Arithmetic, Estimation, and Accurate Computations, and 08.02.03.348.01 Mathematical Reasoning and Problem Solving.

BACKGROUND

This is part of a continuing effort to educate youth about money and make Idaho a leader in financial education. Brad Dugdale is a leader in financial education and has worked with many different groups, schools, educators and legislators to help build financial education programs. Ongoing discussion with Senator John Goedde has led to the presentation before the Board.

DISCUSSION

This item is really about future value. The future value of all Idaho citizens – not just in economic terms but in terms of individual potential. A few statistics related to the growing need for practical financial education:

More than half of all workers age 55 or older have less than $50,000 in total savings or investments. (source: Employee Benefit Research Institute, 2005 Retirement Confidence Survey)

In the second quarter of 2005, the national savings rate was minus 0.6 percent (Source: American Bankers Association)

Each year since 1997 the Jump$tart Coalition for Financial Literacy has administered a financial literacy test to high school seniors. Sixty-five percent of the students tested in 2004 failed the exam. (Source: 2004 Jump$tart Coalition Survey by Lewis Mandell, Ph.D.)

In a survey recently conducted by Ameriprise Financial on the financial concerns of baby boomers as they enter retirement 55% of them cited “help in educating their children and grandchildren about money” as their number one concern.

IMPACT

Improved financial education has both social and fiscal impacts. Students coming out of high school, whether college bound or taking their place in the workforce will be better off with a real life understanding of how money works and how they can make it work for them. Graduates face immediate issues and decisions concerning things such as student loans and credit cards. Without a solid foundation of financial knowledge, they may make decisions that put them behind financially before they ever have a chance to get ahead. Conventional wisdom is

that programs such as social security will be non-existent for the generation in school now. By being proactive in educating these students they will be empowered to take personal responsibility for financial security shifting any future burden from government and essential state programs. Individuals who currently are or are on the path to financial security are happier, healthier, more productive and better citizens. If every Idaho citizen understood money better and was able to be financial independent this state would be the most prosperous and financially sound state in America.

STAFF COMMENTS AND RECOMMENDATIONS

Staff has no comments and recommendations.

BOARD ACTION

This item is for informational purposes only. Any action will be at the Board's discretion.

REFERENCE: APPLICABLE STATUTE, RULE, OR POLICY

347. BASIC ARITHMETIC, ESTIMATION, AND ACCURATE COMPUTATIONS.

Standard - The student will:	Content Knowledge and Skills:
01. Understand and use numbers.	**a.** Understand and use positive and negative numbers, fractions, decimals, percentages, and scientific notation. **b.** Understand properties of the real number system. **c.** Understand properties of roots, exponents, and logarithms. **d.** Use number theory concepts (divisibility rules, factors, multiples, primes) to solve problems.
02. Perform computations accurately.	**a.** Use the proper order of operations. Perform operations with real numbers. **b.** Use graphs, matrices, and sequences to represent and solve problems.
03. Estimate and judge reasonableness of results.	**a.** Apply number sense to every day situations.

(3-15-02)

348. MATHEMATICAL REASONING AND PROBLEM SOLVING.

Standard - The student will:	Content Knowledge and Skills:
01. Understand and use a variety of problem-solving skills.	**a.** Use a variety of methods, including common mathematical formulas, to solve problems drawn from daily life.
02. Use reasoning skills to recognize problems and express them mathematically.	**a.** Use inductive and deductive reasoning to set up a problem. **b.** Use logic to make mathematical proofs. **c.** Make and evaluate logical arguments.
03. Apply appropriate technology and models to find solutions to problems.	**a.** Understand the purpose and capabilities of appropriate technology. **b.** Understand the nature and use of mathematical models.
04. Communicate results using appropriate terminology and methods.	**a.** Select the appropriate means to communicate mathematical information.

(3-15-02)

510. FUNDAMENTALS.

Standard - The student will:	Content Knowledge and Skills:
01. Understand basic economic concepts.	**a.** Define scarcity and explain its implications in decision making. **b.** Know ways in which the interaction of all buyers and sellers influence prices. **c.** Define credit and debt and explain their effects. **d.** Identify the incentives that determine what is produced and distributed in a competitive market system. **e.** Describe the concept of interest and explain how interest rates are determined. **f.** Compare and contrast free market and controlled economies of various nations and eras. **g.** Apply economic concepts to explain the role of imports/exports both nationally and internationally.

(3-15-02)

REFERENCE: APPLICABLE STATUTE, RULE, OR POLICY

513. ECONOMIC INSTITUTIONS.

Standard - The student will:	Content Knowledge and Skills:
01. Know the different types of economic institutions and understand how they differ from one another.	**a.** Know the characteristics of various types of business structures. **b.** Identify the business characteristics of an entrepreneur. **c.** Identify the role of the stock market. **d.** Explain the role of banking institutions. **e.** Explain the purposes of labor unions.

(3-15-02)

514. PERSONAL FINANCE.

Standard - The student will:	Content Knowledge and Skills:
01. Understand the concepts of good personal finance.	**a.** Examine and apply the elements of responsible personal fiscal management. **b.** Identify and evaluate sources and examples of consumers' responsibilities and rights. **c.** Define the concept of taxation as applied to personal finances.

(3-15-02)

SUBJECT

PLATO Learning: I-PLN Presentation

APPLICABLE STATUTE, RULE, OR POLICY

N/A

BACKGROUND

In June 2004 the Board, using $5 million of Title VI federal dollars, entered into a two-year contract with PLATO Learning to make PLATO courseware, technical support, and professional development available to every district for grades K-12. The delivery of the curriculum can accommodate each district's technology infrastructure for Local Area Networks, client-hosted Web, or Web delivery. The program is known as the Idaho PLATO Learning Network (I-PLN). The Board took the lead to put powerful, custom resources directly in the hands of students, teachers, and parents with the end goal of improving student performance.

I-PLN is a technology-based program that allows each district in the state to import individual student Rasch Unit (RIT) scores from the Idaho Standards Achievement Tests (ISAT). The program then identifies a personalized learning path that prescribes appropriate curriculum to remediate or advance skills. This program also provides thousands of hours of standards-based educational curriculum for independent study, subject-matter remediation or acceleration, and project-based activities to promote higher order thinking skills.

DISCUSSION

In the first year of implementation the Plato courseware has been made available in almost every district in the state and in a large majority of the schools. Implementation includes technical assistance in determining the best technology for the courseware to be made available for the particular circumstances of each district, the installation of the courseware, and high quality professional development that includes not only how to use I-PLN but also how to make the use of the courseware to have the most impact. Using the terms of the contract, which includes "unlimited" licenses for K-12 education in the state, the implementation has gone far beyond schools located in the districts. I-PLN has been made available to charter schools, 21st Century Community Learning Centers; juvenile detention facilities where classes are provided for residents, accredited schools in Idaho correctional facilities, schools for students with special needs in several locations around the state, and to the colleges of education in institutions of higher education where teachers are prepared for K-12 education.

IMPACT

Universally, users of Plato courseware indicate that the more they use the products the more ways they think of to put them to use. The Idaho implementation has been no exception. Some of the districts who purchased the courseware prior to the state contract have led the way in creative applications,

but as other districts gain in experience, they are catching up. Some of the many uses for which Idaho schools are using the courseware include remediation of course work; ISAT remediation for the graduation test; use in before, during, and after school labs; a credit recovery process for struggling students; a core element of an alternate graduation mechanism; enrichment of class work; and acceleration for advanced students.

An initial requirement of the contract was that I-PLN be aligned to Idaho standards. This alignment has supported the courseware in all of its uses associated with ISAT and graduation. However, this alignment is not static. Plato uses another of its products and a core of professional staff to regularly analyze alignment status and make necessary adjustments. The current restructuring of Idaho standards will take full advantage of this alignment capability.

With the changes in high school requirements now being discussed, some are beginning to discuss how the courseware can assist in moving students through the requirements by providing additional support. As more schools move into a second year of "needs improvement" status for AYP, there has been increased interest in making I-PLN a part of the supplemental services required to be provided to students in those schools.

Districts and individual teachers are reporting success with their students, and some districts have been pleased enough with I-PLN that they are purchasing additional PLATO products to enhance their efforts to serve their students.

STAFF COMMENTS AND RECOMMENDATIONS

PLATO is being effectively used by the districts and districts are creatively using the courseware to support and enhance student learning.

BOARD ACTION

This item is for informational purposes only. Any action will be at the Board's discretion.

Idaho State Board of Education

Idaho PLATO Learning Network (I-PLN)

Saundra DeKlotz
Federal Programs Manager
Office of the State Board of Education

Dave McMullen
Account Manager

Dave Lanz
Idaho Senior Project Manager

The First Year . . .

I-PLN Mission

- To provide Idaho students in all grades with computer-based curriculum and objective-level mastery assessments designed to help improve ISAT scores and promote student academic growth

PLATO® LEARNING

2004-05 Progress

- Over 550 schools set up this year
- At least 126,000 student hours working in I-PLN
- Over 18,000 students have completed work representing nearly 10% of Idaho student pop.
- Over 200 on-site days of professional development delivered last year. Will deliver approximately 170 this year.
- Flexibility for School Districts
  - Web-based
  - LAN-based
  - Client hosted

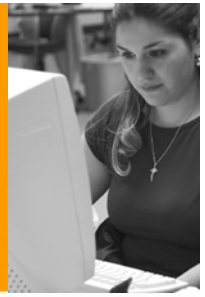
PLATO® LEARNING

Reaching "Out of the Box"

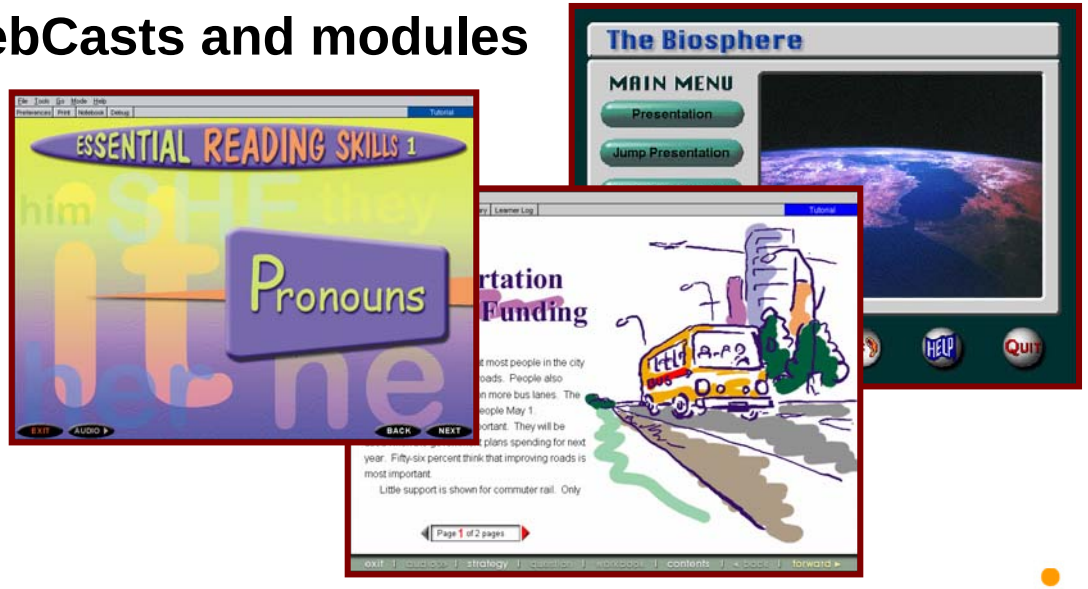
- 9 Prison educational facilities
- 26 Charter Schools
- NW Children's Home facilities
- Idaho Youth Ranch facilities
- Colleges of Education
- 21st Century Learning Centers
- COSSA (Canyon-Owyhee School Service Org.)
- Idaho School for the Deaf and the Blind
- Juvenile Detention Centers

PLATO® LEARNING

Implementation Enhancements



- **I-PLN Web Page: www.plato.com/i-pln.asp**
- **I-PLN Training Kit: course syllabi, CDs, handbooks, etc.**
- **College Credit Offerings: Graduate or Undergraduate**
- **On-line training WebCasts and modules**
- **Data import tools**
- **I-PLN Newsletter**



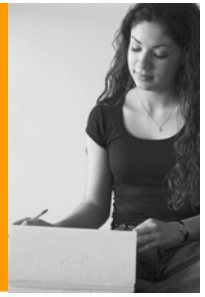
PLATO LEARNING

Teacher Feedback

- “It’s just too valuable to schools and their students . . . Teachers love it.” --Meridian SD
- “I know that they are learning because I see them using the skills being taught in other classes.” –Mountain Home SD
- “I-PLN is not only an ISAT remediation tool; it is also a proactive skill enhancer” --Moscow SD

PLATO® LEARNING

Meeting Special Needs



- Middleton SD reports successful utilization of I-PLN, “with LEP, Title 1, Special-Education . . . remediation, acceleration . . .credit recovery and ISAT intervention.”
- Council SD superintendent reports 60% decrease in the number of students in need of summer school remediation. (2003-04 to 2004-05 school years)

PLATO® LEARNING

Meeting Special Needs

- Jerome SD reported impressive ISAT gains in a group of approximately 100 at-risk students—9-22 points!
- “My special education students . . . saw a large growth in their (ISAT) scores . . 7 to 22 points growth.” --Mountain Home SD
- “We did have one Special Ed student that jumped 37 points.” --Butte County SD

PLATO® LEARNING

High School Graduation

- “I have no doubt that several students would not have graduated last year if it were not for PLATO . . . The program has really helped!” --Superintendent Nelson, Valley SD
- Post Falls SD used I-PLN to help “a class of 30 students that were not going to graduate based on not passing the math ISAT.”

PLATO® LEARNING

Remediation & Intervention

- Soda Springs SD resource room teacher says, “it is a very useful tool to provide individualization needed for students . . . One student raised his **math** ISAT score by 25 points.”
- “We have found I-PLN to be an important part of our **reading** program . . . focusing instruction on specific areas for individual students.” --Arbon SD

PLATO® LEARNING

Acceleration

- “Parents of advanced students were the first to eagerly request access to IPLN from home. So far it seems to be an effective way to meet the needs of this group of students.”
  - Camille Woods, Idaho Falls School District

PLATO LEARNING

Limited English Proficiency

- “We had 100 percent of our ESL population in one of our middle schools using PLATO on a daily basis.”
  - Doris Matthews, Nampa SD

PLATO® LEARNING

Systemic Change

- “Our focus this year is *Differentiation*, so PLATO fits in very well.” --Madison SD
- “We look forward to using the program more next year and seeing the ISAT results we know it can offer.” --Meridian SD
- “This is great!” --Highland SD

PLATO® LEARNING

Systemic Change

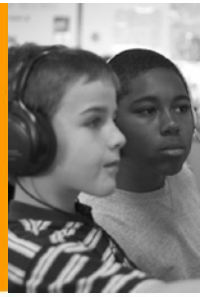
- “We have built our alternative graduation mechanism around IPLN and have also purchased additional curriculum (Science and Social Studies) for credit recovery courses. We also plan to use IPLN for home bound students.” --Camille Woods, Idaho Falls School District

PLATO® LEARNING

Data Driven

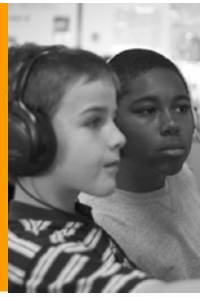
- How will we identify issues and adapt to increase effectiveness?
  - Feedback
  - PLATO Research Project
  - Independent Research

PLATO® LEARNING



- ***"I use the PLATO I-PLN software to demonstrate concepts on the Smart Board, or for small and large-group work. It's Awesome! Every student's engaged!"***
  - ***Suzanne Pace, Jefferson County Joint SD 251***

PLATO® LEARNING



- ***"They (the students) enjoy it and are fully motivated and engaged."***
  - ***Andree Scown, Superintendent Pleasant Valley School District #364***

PLATO® LEARNING

Idaho State Board of Education

Idaho PLATO Learning Network

PLATO LEARNING

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SUBJECT

Recommendations from the Board Committee on the Education of the Deaf and the Blind regarding education programs for the deaf/hard of hearing and the blind/visually-impaired students in Idaho.

APPLICABLE STATUTE, RULE, OR POLICY

N/A

BACKGROUND

In July 2005, the Board organized a committee to examine education programs for deaf/hard of hearing and blind/visually-impaired students in Idaho. The Office of Performance Evaluation (OPE), upon direction from the Joint Legislative Oversight Committee (JLOC) conducted a review of the Idaho School for the Deaf and the Blind in order to present a report to JLOC in October 2005. The Board committee purposefully established a committee to examine rules, statute, policies and programs serving that specific population. The committee was assigned the task of making recommendations to the Board at the December Board meeting.

DISCUSSION

The committee has listened to stakeholders and experts in the fields of Special Education, Deaf/Hard of Hearing Education, Blind/Visually-Impaired Education, Cochlear Implants, Assistive Technology, and Educational Funding. The Committee has invited public comment and conducted a public meeting in Gooding, Idaho to seek stakeholder input. The committee members finalized their recommendations at a meeting on November 28, 2005 and presented those recommendations to the Board on December 1, 2005. Committee Chair Stone also commented on the OPE report and shared the committee recommendations at the December 13, 2005 JLOC meeting in Boise.

IMPACT

The committee recommendations, if implemented, would allow for equitable distribution of education funds to students with these particular disabilities and would allow the state to provide appropriate programs to meet the needs of all Idaho students who are deaf/hard of hearing or blind/visually-impaired.

STAFF COMMENTS AND RECOMMENDATIONS

Staff recommends the Board approve the recommendations of the committee and appoint the working group.

BOARD ACTION

A motion to approve the recommendations provided by the Committee on the Education of the Deaf and the Blind and to direct staff to move forward to implement the recommendations, including proposing revision to legislation, rules, or policies as necessary.

Moved by _____ Seconded by _____ Carried Yes _____ No _____

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SUBJECT

No Child Left Behind Sanctions for Idaho Schools not making Adequate Yearly Progress.

APPLICABLE STATUTE, RULE, OR POLICY

08.02.03 Rules Governing Thoroughness, Section 114. Compliance with Federal Law

BACKGROUND

At the November 12, 2004 meeting, the Board adopted rules in order to comply with No Child left Behind (NCLB). The rules for those schools that do not meet Adequate Yearly Progress were created in IDAPA 08.02.03, Rules Governing Thoroughness, Section 114. Failure to Meet Adequate Yearly Progress.

DISCUSSION

No Child Left Behind requires that schools that receive federal Title I funding make Adequate Yearly Progress (AYP) based upon assessments that are aligned with state standards. In Idaho, AYP is measured using data from the Idaho Standards Achievement Tests or ISAT. Historically, in an effort to ensure that all schools are held to the same standards for providing instruction for students that ensures growth, Idaho has held both Title I and non Title I schools to the same standards of growth and the same sanctions for not making AYP. Given the data and feedback regarding the effects of NCLB requirements and sanctions for schools not making AYP, Board Member Thilo would like to review Idaho requirements and consider revising requirements or sanctions to ensure that all Idaho students continue to receive equitable opportunities for success.

IMPACT

Changes in sanctions may provide increased flexibility for both Title I and non Title I schools to provide appropriate programs to increase student growth.

STAFF COMMENTS AND RECOMMENDATIONS

This is a discussion item only.

BOARD ACTION

This item is for informational purposes only. Any action will be at the Board's discretion.

114. FAILURE TO MEET ADEQUATE YEARLY PROGRESS (AYP).

01. Compliance with Federal Law. All schools and local educational agencies in this state shall comply with applicable federal laws governing specific federal grants. (4-6-05)

a. With respect to schools and local educational agencies in this state that receive federal grants under title I of the Elementary and Secondary Education Act of 1965, as amended by the No Child Left Behind Act of 2001 (Title I schools), the State Department of Education shall develop procedures for approval by the State Board of Education, consistent with federal law, that describe actions to be taken by local educational agencies and schools in this state in regard to schools that fail to meet AYP. (4-6-05)

b. With respect to schools and local educational agencies in this state that do not receive federal grants under Title I of the Elementary and Secondary Education Act of 1965, as amended by the No Child Left Behind Act of 2001, such non-Title I schools and local educational agencies shall be required to comply with federal law and with the procedures relating to failure to meet AYP as provided in Subsection 114.01.a. of this rule, as if they were Title I schools, except that any provisions relating to the use of federal grants to pay for such expenses shall not be applicable to such non-Title I schools and local educational agencies. In such event, non-title I schools shall be required to fund such compliance costs from general operating funds. (4-6-05)

02. State Department of Education. With respect to the implementation of duties responsibilities described under Title I of the Elementary and Secondary Education Act of 1965, as amended by the No Child Left Behind Act of 2001, that are applicable to a state educational agency, the State Department of Education shall perform such duties and responsibilities, including, but not limited to, making technical assistance available to local educational agencies that fail to meet AYP as required under federal law, and for providing technical assistance, developing improvement plans, and providing for mandatory corrective actions to local educational agencies as required under federal law.