

COVER SHEET FOR PROPOSAL TO THE NATIONAL SCIENCE FOUNDATION

| PROGRAM ANNOUNCEMENT/SOLICITATION NO./CLOSING DATE/if not in response to a program announcement/solicitation enter NSF 04-23 | | | | | FOR NSF USE ONLY | |
|--|------------------|---|--|---|--------------------------------|---|
| NSF 04-23 | | | | | NSF PROPOSAL NUMBER | |
| FOR CONSIDERATION BY NSF ORGANIZATION UNIT(S) (Indicate the most specific unit known, i.e. program, division, etc.) | | | | | 0553768 | |
| DEB - ECOLOGICAL BIOLOGY CLUSTER | | | | | | |
| DATE RECEIVED | NUMBER OF COPIES | DIVISION ASSIGNED | FUND CODE | DUNS# (Data Universal Numbering System) | FILE LOCATION | |
| 09/15/2005 | 12 | 08010208 DEB | 1128 | 094878394 | 09/15/2005 2:02pm | |
| EMPLOYER IDENTIFICATION NUMBER (EIN) OR TAXPAYER IDENTIFICATION NUMBER (TIN) | | SHOW PREVIOUS AWARD NO. IF THIS IS <input checked="" type="checkbox"/> A RENEWAL <input type="checkbox"/> AN ACCOMPLISHMENT-BASED RENEWAL | | IS THIS PROPOSAL BEING SUBMITTED TO ANOTHER FEDERAL AGENCY? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES, LIST ACRONYM(S) | | |
| 956006145 | | 0072909 | | | | |
| NAME OF ORGANIZATION TO WHICH AWARD SHOULD BE MADE | | | ADDRESS OF AWARDEE ORGANIZATION, INCLUDING 9 DIGIT ZIP CODE | | | |
| University of California-Santa Barbara | | | University of California-Santa Barbara | | | |
| AWARDEE ORGANIZATION CODE (IF KNOWN) | | | Office of Research | | | |
| 0013201000 | | | Santa Barbara, CA. 931062050 | | | |
| NAME OF PERFORMING ORGANIZATION, IF DIFFERENT FROM ABOVE | | | ADDRESS OF PERFORMING ORGANIZATION, IF DIFFERENT, INCLUDING 9 DIGIT ZIP CODE | | | |
| PERFORMING ORGANIZATION CODE (IF KNOWN) | | | | | | |
| IS AWARDEE ORGANIZATION (Check All That Apply) (See GPG II.C For Definitions) <input type="checkbox"/> SMALL BUSINESS <input type="checkbox"/> MINORITY BUSINESS <input type="checkbox"/> IF THIS IS A PRELIMINARY PROPOSAL THEN CHECK HERE <input type="checkbox"/> FOR-PROFIT ORGANIZATION <input type="checkbox"/> WOMAN-OWNED BUSINESS | | | | | | |
| TITLE OF PROPOSED PROJECT NCEAS: National Center for Ecological Analysis and Synthesis | | | | | | |
| REQUESTED AMOUNT \$ 18,386,821 | | PROPOSED DURATION (1-60 MONTHS) 60 months | | REQUESTED STARTING DATE 08/01/06 | | SHOW RELATED PRELIMINARY PROPOSAL NO. IF APPLICABLE |
| CHECK APPROPRIATE BOX(ES) IF THIS PROPOSAL INCLUDES ANY OF THE ITEMS LISTED BELOW | | | | | | |
| <input type="checkbox"/> BEGINNING INVESTIGATOR (GPG I.A) <input type="checkbox"/> HUMAN SUBJECTS (GPG II.D.6) Exemption Subsection _____ or IRB App. Date _____ | | | | | | |
| <input type="checkbox"/> DISCLOSURE OF LOBBYING ACTIVITIES (GPG II.C) <input type="checkbox"/> INTERNATIONAL COOPERATIVE ACTIVITIES: COUNTRY/COUNTRIES INVOLVED (GPG II.C.2.j) | | | | | | |
| <input type="checkbox"/> PROPRIETARY & PRIVILEGED INFORMATION (GPG I.B, II.C.1.d) <input type="checkbox"/> HIGH RESOLUTION GRAPHICS/OTHER GRAPHICS WHERE EXACT COLOR REPRESENTATION IS REQUIRED FOR PROPER INTERPRETATION (GPG I.G.1) | | | | | | |
| <input type="checkbox"/> HISTORIC PLACES (GPG II.C.2.j) | | | | | | |
| <input type="checkbox"/> SMALL GRANT FOR EXPLOR. RESEARCH (SGER) (GPG II.D.1) | | | | | | |
| <input type="checkbox"/> VERTEBRATE ANIMALS (GPG II.D.5) IACUC App. Date _____ | | | | | | |
| PI/PD DEPARTMENT Marine Science Institute | | | PI/PD POSTAL ADDRESS | | | |
| PI/PD FAX NUMBER 805-892-2510 | | | Santa Barbara, CA 93106 | | | |
| | | | United States | | | |
| NAMES (TYPED) | | High Degree | Yr of Degree | Telephone Number | Electronic Mail Address | |
| Omer J Reichman | | Ph.D. | 1974 | 805-892-2500 | reichman@nceas.ucsb.edu | |
| CO-PI/PD | | | | | | |
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CERTIFICATION PAGE

Certification for Authorized Organizational Representative or Individual Applicant:

By signing and submitting this proposal, the individual applicant or the authorized official of the applicant institution is: (1) certifying that statements made herein are true and complete to the best of his/her knowledge; and (2) agreeing to accept the obligation to comply with NSF award terms and conditions if an award is made as a result of this application. Further, the applicant is hereby providing certifications regarding debarment and suspension, drug-free workplace, and lobbying activities (see below), as set forth in Grant Proposal Guide (GPG), NSF 04-23. Willful provision of false information in this application and its supporting documents or in reports required under an ensuing award is a criminal offense (U. S. Code, Title 18, Section 1001).

In addition, if the applicant institution employs more than fifty persons, the authorized official of the applicant institution is certifying that the institution has implemented a written and enforced conflict of interest policy that is consistent with the provisions of Grant Policy Manual Section 510; that to the best of his/her knowledge, all financial disclosures required by that conflict of interest policy have been made; and that all identified conflicts of interest will have been satisfactorily managed, reduced or eliminated prior to the institution's expenditure of any funds under the award, in accordance with the institution's conflict of interest policy. Conflicts which cannot be satisfactorily managed, reduced or eliminated must be disclosed to NSF.

Drug Free Work Place Certification

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Drug Free Work Place Certification contained in Appendix C of the Grant Proposal Guide.

Debarment and Suspension Certification

(If answer "yes", please provide explanation.)

Is the organization or its principals presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency?

Yes

No

By electronically signing the NSF Proposal Cover Sheet, the Authorized Organizational Representative or Individual Applicant is providing the Debarment and Suspension Certification contained in Appendix D of the Grant Proposal Guide.

Certification Regarding Lobbying

This certification is required for an award of a Federal contract, grant, or cooperative agreement exceeding \$100,000 and for an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding \$150,000.

Certification for Contracts, Grants, Loans and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure of Lobbying Activities," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

| | | | |
|--|---|-----------------------------------|---------------------------|
| AUTHORIZED ORGANIZATIONAL REPRESENTATIVE | | SIGNATURE | DATE |
| NAME Jill Boltz | | Electronic Signature | Sep 15 2005 1:29PM |
| TELEPHONE NUMBER 805-893-8809 | ELECTRONIC MAIL ADDRESS boltz@research.ucsb.edu | FAX NUMBER 805-893-2611 | |

*SUBMISSION OF SOCIAL SECURITY NUMBERS IS VOLUNTARY AND WILL NOT AFFECT THE ORGANIZATION'S ELIGIBILITY FOR AN AWARD. HOWEVER, THEY ARE AN INTEGRAL PART OF THE INFORMATION SYSTEM AND ASSIST IN PROCESSING THE PROPOSAL. SSN SOLICITED UNDER NSF ACT OF 1950, AS AMENDED.

**Directorate for Biological Sciences
Division of Environmental Biology
Ecological Biology Cluster**

**Proposal Classification Form
PI: / Proposal Number: 0553768**

CATEGORY I: INVESTIGATOR STATUS (Select ONE)

- Beginning Investigator - No previous Federal support as PI or Co-PI, excluding fellowships, dissertations, planning grants, etc.
- Prior Federal support only
- Current Federal support only
- Current & prior Federal support

CATEGORY II: FIELDS OF SCIENCE OTHER THAN BIOLOGY INVOLVED IN THIS RESEARCH (Select 1 to 3)

- | | | |
|---|---|---|
| <input type="checkbox"/> Astronomy | <input type="checkbox"/> Engineering | <input type="checkbox"/> Psychology |
| <input type="checkbox"/> Chemistry | <input checked="" type="checkbox"/> Mathematics | <input checked="" type="checkbox"/> Social Sciences |
| <input type="checkbox"/> Computer Science | <input type="checkbox"/> Physics | <input type="checkbox"/> None of the Above |
| <input checked="" type="checkbox"/> Earth Science | | |

CATEGORY III: SUBSTANTIVE AREA (Select 1 to 4)

- | | | |
|--|--|--|
| <input type="checkbox"/> BIOGEOGRAPHY | <input type="checkbox"/> Decomposition | <input type="checkbox"/> Molecular Evolution |
| <input type="checkbox"/> Island Biogeography | <input type="checkbox"/> Biogeochemistry | <input type="checkbox"/> Methodology/Theory |
| <input type="checkbox"/> Historical/ Evolutionary Biogeography | <input type="checkbox"/> Limnology/Hydrology | <input type="checkbox"/> Isozymes/ Electrophoresis |
| <input type="checkbox"/> Phylogeography | <input type="checkbox"/> Climate/Microclimate | <input type="checkbox"/> Nucleic Acid Analysis (general) |
| <input type="checkbox"/> Methods/Theory | <input type="checkbox"/> Whole-System Analysis | <input type="checkbox"/> Restriction Enzymes |
| <input type="checkbox"/> CHROMOSOME STUDIES | <input type="checkbox"/> Productivity/Biomass | <input type="checkbox"/> Nucleotide Sequencing |
| <input type="checkbox"/> Chromosome Evolution | <input type="checkbox"/> System Energetics | <input type="checkbox"/> Nuclear DNA |
| <input type="checkbox"/> Chromosome Number | <input type="checkbox"/> Landscape Dynamics | <input type="checkbox"/> Mitochondrial DNA |
| <input type="checkbox"/> Mutation | <input type="checkbox"/> Chemical & Biochemical Control | <input type="checkbox"/> Chloroplast DNA |
| <input type="checkbox"/> Mitosis and Meiosis | <input type="checkbox"/> Global Change | <input type="checkbox"/> RNA Analysis |
| <input checked="" type="checkbox"/> COMMUNITY ECOLOGY | <input type="checkbox"/> Climate Change | <input type="checkbox"/> DNA Hybridization |
| <input type="checkbox"/> Community Analysis | <input type="checkbox"/> Regional Studies | <input type="checkbox"/> Recombinant DNA |
| <input type="checkbox"/> Community Structure | <input type="checkbox"/> Global Studies | <input type="checkbox"/> Amino Acid Sequencing |
| <input type="checkbox"/> Community Stability | <input type="checkbox"/> Forestry | <input type="checkbox"/> Gene/Genome Mapping |
| <input type="checkbox"/> Succession | <input type="checkbox"/> Resource Management (Wildlife, Fisheries, Range, Other) | <input type="checkbox"/> Natural Products |
| <input type="checkbox"/> Experimental Microcosms/ Mesocosms | <input type="checkbox"/> Agricultural Ecology | <input type="checkbox"/> Serology/Immunology |
| <input type="checkbox"/> Disturbance | <input type="checkbox"/> EXTREMOPHILES | <input type="checkbox"/> PALEONTOLOGY |
| <input type="checkbox"/> Patch Dynamics | <input type="checkbox"/> GENOMICS (Genome sequence, organization, function) | <input type="checkbox"/> Floristic |
| <input type="checkbox"/> Food Webs/ Trophic Structure | <input type="checkbox"/> Viral | <input type="checkbox"/> Faunistic |
| <input type="checkbox"/> Keystone Species | <input type="checkbox"/> Microbial | <input type="checkbox"/> Paleoecology |
| <input type="checkbox"/> COMPUTATIONAL BIOLOGY | <input type="checkbox"/> Fungal | <input type="checkbox"/> Biostratigraphy |
| <input type="checkbox"/> CONSERVATION & RESTORATION BIOLOGY | <input type="checkbox"/> Plant | <input type="checkbox"/> Palynology |
| <input type="checkbox"/> DATABASES | <input type="checkbox"/> Animal | <input type="checkbox"/> Micropaleontology |
| <input checked="" type="checkbox"/> ECOSYSTEMS LEVEL | <input type="checkbox"/> MARINE MAMMALS | <input type="checkbox"/> Paleoclimatology |
| <input type="checkbox"/> Physical Structure | <input type="checkbox"/> MOLECULAR APPROACHES | <input type="checkbox"/> Archeozoic |
| | | <input type="checkbox"/> Paleozoic |
| | | <input type="checkbox"/> Mesozoic |

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|--|---|--|
| <input type="checkbox"/> Cenozoic <input checked="" type="checkbox"/> POPULATION DYNAMICS & LIFE HISTORY <input type="checkbox"/> Demography/ Life History <input type="checkbox"/> Population Cycles <input type="checkbox"/> Distribution/Patchiness/ Marginal Populations <input type="checkbox"/> Population Regulation <input type="checkbox"/> Intraspecific Competition <input type="checkbox"/> Reproductive Strategies <input type="checkbox"/> Gender Allocation <input type="checkbox"/> Metapopulations <input type="checkbox"/> Extinction <input type="checkbox"/> POPULATION GENETICS & BREEDING SYSTEMS <input type="checkbox"/> Variation <input type="checkbox"/> Microevolution <input type="checkbox"/> Speciation <input type="checkbox"/> Hybridization <input type="checkbox"/> Inbreeding/Outbreeding <input type="checkbox"/> Gene Flow Measurement <input type="checkbox"/> Inheritance/Heritability | <input type="checkbox"/> Quantitative Genetics/ QTL Analysis <input type="checkbox"/> Ecological Genetics <input type="checkbox"/> Gender Ratios <input type="checkbox"/> Apomixis/ Parthenogenesis <input type="checkbox"/> Vegetative Reproduction <input type="checkbox"/> SPECIES INTERACTIONS <input type="checkbox"/> Predation <input type="checkbox"/> Herbivory <input type="checkbox"/> Omnivory <input type="checkbox"/> Interspecific Competition <input type="checkbox"/> Niche Relationships/ Resource Partitioning <input type="checkbox"/> Pollination/ Seed Dispersal <input type="checkbox"/> Parasitism <input type="checkbox"/> Mutualism/ Commensalism <input type="checkbox"/> Plant/Fungal/ Microbial Interactions <input type="checkbox"/> Mimicry <input type="checkbox"/> Animal Pathology <input type="checkbox"/> Plant Pathology | <input type="checkbox"/> Coevolution <input type="checkbox"/> Biological Control <input checked="" type="checkbox"/> STATISTICS & MODELING <input type="checkbox"/> Methods/ Instrumentation/ Software <input type="checkbox"/> Modeling (general) <input type="checkbox"/> Statistics (general) <ul style="list-style-type: none"> <input type="checkbox"/> Multivariate Methods <input type="checkbox"/> Spatial Statistics & Spatial Modeling <input type="checkbox"/> Sampling Design & Analysis <input type="checkbox"/> Experimental Design & Analysis <input type="checkbox"/> SYSTEMATICS <input type="checkbox"/> Taxonomy/Classification <input type="checkbox"/> Nomenclature <input type="checkbox"/> Monograph/Revision <input type="checkbox"/> Phylogenetics <input type="checkbox"/> Phenetics/Cladistics/ Numerical Taxonomy <input type="checkbox"/> Macroevolution <input type="checkbox"/> NONE OF THE ABOVE |
|--|---|--|

CATEGORY IV: INFRASTRUCTURE (Select 1 to 3)

| | | |
|--|---|---|
| COLLECTIONS/STOCK CULTURES <input type="checkbox"/> Natural History Collections <input checked="" type="checkbox"/> DATABASES FACILITIES <input type="checkbox"/> Controlled Environment Facilities | <input type="checkbox"/> Field Stations <ul style="list-style-type: none"> <input type="checkbox"/> Field Facility Structure <input type="checkbox"/> Field Facility Equipment <input type="checkbox"/> LTER Site <input type="checkbox"/> INDUSTRY PARTICIPATION | <input type="checkbox"/> Technique Development TRACKING SYSTEMS <input type="checkbox"/> Geographic Information Systems <input type="checkbox"/> Remote Sensing <input type="checkbox"/> NONE OF THE ABOVE |
|--|---|---|

CATEGORY V: HABITAT (Select 1 to 2)

| | | |
|--|---|--|
| TERRESTRIAL HABITATS | | |
| <input checked="" type="checkbox"/> GENERAL TERRESTRIAL <input type="checkbox"/> TUNDRA <input type="checkbox"/> BOREAL FOREST <input type="checkbox"/> TEMPERATE <ul style="list-style-type: none"> <input type="checkbox"/> Deciduous Forest <input type="checkbox"/> Coniferous Forest <input type="checkbox"/> Rain Forest <input type="checkbox"/> Mixed Forest <input type="checkbox"/> Prairie/Grasslands <input type="checkbox"/> Desert <input type="checkbox"/> SUBTROPICAL <ul style="list-style-type: none"> <input type="checkbox"/> Rain Forest <input type="checkbox"/> Seasonal Forest | <input type="checkbox"/> Savanna <input type="checkbox"/> Thornwoods <input type="checkbox"/> Deciduous Forest <input type="checkbox"/> Coniferous Forest <input type="checkbox"/> Desert <input type="checkbox"/> TROPICAL <ul style="list-style-type: none"> <input type="checkbox"/> Rain Forest <input type="checkbox"/> Seasonal Forest <input type="checkbox"/> Savanna <input type="checkbox"/> Thornwoods <input type="checkbox"/> Deciduous Forest <input type="checkbox"/> Coniferous Forest <input type="checkbox"/> Desert | <input type="checkbox"/> CHAPPARAL/ SCLEROPHYLL/ SHRUBLANDS <input type="checkbox"/> ALPINE <input type="checkbox"/> MONTANE <input type="checkbox"/> CLOUD FOREST <input type="checkbox"/> RIPARIAN ZONES <input type="checkbox"/> ISLANDS (except Barrier Islands) <input type="checkbox"/> BEACHES/ DUNES/ SHORES/ BARRIER ISLANDS <input type="checkbox"/> CAVES/ ROCK OUTCROPS/ CLIFFS <input type="checkbox"/> CROPLANDS/ FALLOW FIELDS/ PASTURES <input type="checkbox"/> URBAN/SUBURBAN <input type="checkbox"/> SUBTERRANEAN/ SOIL/ SEDIMENTS <input type="checkbox"/> EXTREME TERRESTRIAL ENVIRONMENT <input type="checkbox"/> AERIAL |

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| AQUATIC HABITATS | | |
| <input checked="" type="checkbox"/> GENERAL AQUATIC | <input type="checkbox"/> Open Ocean/Continental Shelf | <input type="checkbox"/> EXTREME AQUATIC ENVIRONMENT |
| <input type="checkbox"/> FRESHWATER | <input type="checkbox"/> Bathyal | <input type="checkbox"/> CAVES/ ROCK OUTCROPS/ CLIFFS |
| <input type="checkbox"/> Wetlands/Bogs/Swamps | <input type="checkbox"/> Abyssal | <input type="checkbox"/> MANGROVES |
| <input type="checkbox"/> Lakes/Ponds | <input type="checkbox"/> Estuarine | <input type="checkbox"/> SUBSURFACE WATERS/ SPRINGS |
| <input type="checkbox"/> Rivers/Streams | <input type="checkbox"/> Intertidal/Tidal/Coastal | <input type="checkbox"/> EPIHEMERAL POOLS & STREAMS |
| <input type="checkbox"/> Reservoirs | <input type="checkbox"/> Coral Reef | <input type="checkbox"/> MICROPOOLS (Pitcher Plants, Tree Holes, Other) |
| <input type="checkbox"/> MARINE | <input type="checkbox"/> HYPERSALINE | |
| MAN-MADE ENVIRONMENTS | | |
| <input type="checkbox"/> LABORATORY | <input type="checkbox"/> THEORETICAL SYSTEMS | <input type="checkbox"/> OTHER ARTIFICIAL SYSTEMS |
| NOT APPLICABLE | | |
| <input type="checkbox"/> NOT APPLICABLE | | |

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|---|---|---|
| CATEGORY VI: GEOGRAPHIC AREA OF THE RESEARCH (Select 1 to 2) | | |
| <input checked="" type="checkbox"/> WORLDWIDE | <input type="checkbox"/> Eastern South America (Guyana, Fr. Guiana, Suriname, Brazil) | <input type="checkbox"/> North Africa |
| <input type="checkbox"/> NORTH AMERICA | <input type="checkbox"/> Northern South America (Colombia, Venezuela) | <input type="checkbox"/> African South of the Sahara |
| <input type="checkbox"/> United States | <input type="checkbox"/> Southern South America (Chile, Argentina, Uruguay, Paraguay) | <input type="checkbox"/> East Africa |
| <input type="checkbox"/> Northeast US (CT, MA, ME, NH, NJ, NY, PA, RI, VT) | <input type="checkbox"/> Western South America (Ecuador, Peru, Bolivia) | <input type="checkbox"/> Madagascar |
| <input type="checkbox"/> Northcentral US (IA, IL, IN, MI, MN, ND, NE, OH, SD, WI) | <input type="checkbox"/> EUROPE | <input type="checkbox"/> South Africa |
| <input type="checkbox"/> Northwest US (ID, MT, OR, WA, WY) | <input type="checkbox"/> Eastern Europe | <input type="checkbox"/> West Africa |
| <input type="checkbox"/> Southeast US (DC, DE, FL, GA, MD, NC, SC, WV, VA) | <input type="checkbox"/> Russia | <input type="checkbox"/> AUSTRALASIA |
| <input type="checkbox"/> Southcentral US (AL, AR, KS, KY, LA, MO, MS, OK, TN, TX) | <input type="checkbox"/> Scandinavia | <input type="checkbox"/> Australia |
| <input type="checkbox"/> Southwest US (AZ, CA, CO, NM, NV, UT) | <input type="checkbox"/> Western Europe | <input type="checkbox"/> New Zealand |
| <input type="checkbox"/> Alaska | <input type="checkbox"/> ASIA | <input type="checkbox"/> Pacific Islands |
| <input type="checkbox"/> Hawaii | <input type="checkbox"/> Central Asia | <input type="checkbox"/> ANTARCTICA |
| <input type="checkbox"/> Puerto Rico | <input type="checkbox"/> Far East | <input type="checkbox"/> ARCTIC |
| <input type="checkbox"/> Canada | <input type="checkbox"/> Middle East | <input type="checkbox"/> ATLANTIC OCEAN |
| <input type="checkbox"/> Mexico | <input type="checkbox"/> Siberia | <input type="checkbox"/> PACIFIC OCEAN |
| <input type="checkbox"/> CENTRAL AMERICA (Mainland) | <input type="checkbox"/> South Asia | <input type="checkbox"/> INDIAN OCEAN |
| <input type="checkbox"/> Caribbean Islands | <input type="checkbox"/> Southeast Asia | <input type="checkbox"/> OTHER REGIONS (Not defined) |
| <input type="checkbox"/> Bermuda/Bahamas | <input type="checkbox"/> AFRICA | <input type="checkbox"/> NOT APPLICABLE |
| <input type="checkbox"/> SOUTH AMERICA | | |

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| CATEGORY VII: CLASSIFICATION OF ORGANISMS (Select 1 to 4) | | |
| <input type="checkbox"/> VIRUSES | <input type="checkbox"/> Radiolaria | <input type="checkbox"/> Dinoflagellata |
| <input type="checkbox"/> Bacterial | <input type="checkbox"/> FUNGI | <input type="checkbox"/> Euglenoids |
| <input type="checkbox"/> Plant | <input type="checkbox"/> Ascomycota | <input type="checkbox"/> Phaeophyta |
| <input type="checkbox"/> Animal | <input type="checkbox"/> Basidiomycota | <input type="checkbox"/> Rhodophyta |
| <input type="checkbox"/> PROKARYOTES | <input type="checkbox"/> Chytridiomycota | <input checked="" type="checkbox"/> PLANTS |
| <input type="checkbox"/> Archaeobacteria | <input type="checkbox"/> Mitosporic Fungi | <input type="checkbox"/> NON-VASCULAR PLANTS |
| <input type="checkbox"/> Cyanobacteria | <input type="checkbox"/> Oomycota | <input type="checkbox"/> BRYOPHYTA |
| <input type="checkbox"/> Eubacteria | <input type="checkbox"/> Zygomycota | <input type="checkbox"/> Anthocerotae (Hornworts) |
| <input type="checkbox"/> PROTISTA (PROTOZOA) | <input type="checkbox"/> LICHENS | <input type="checkbox"/> Hepaticae (Liverworts) |
| <input type="checkbox"/> Amoeboae | <input type="checkbox"/> SLIME MOLDS | <input type="checkbox"/> Musci (Mosses) |
| <input type="checkbox"/> Apicomplexa | <input type="checkbox"/> ALGAE | <input type="checkbox"/> VASCULAR PLANTS |
| <input type="checkbox"/> Ciliophora | <input type="checkbox"/> Bacillariophyta (Diatoms) | <input type="checkbox"/> FERNS & FERN ALLIES |
| <input type="checkbox"/> Flagellates | <input type="checkbox"/> Charophyta | <input type="checkbox"/> GYMNOSPERMS |
| <input type="checkbox"/> Foraminifera | <input type="checkbox"/> Chlorophyta | <input type="checkbox"/> Coniferales (Conifers) |
| <input type="checkbox"/> Microspora | <input type="checkbox"/> Chrysophyta | <input type="checkbox"/> Cycadales (Cycads) |

| | | | | | |
|-------------------------------------|---|--------------------------|--|--------------------------|--|
| <input type="checkbox"/> | Ginkgoales (Ginkgo) | <input type="checkbox"/> | Polyplacophora (Chitons) | <input type="checkbox"/> | Coleoptera (Beetles) |
| <input type="checkbox"/> | Gnetales (Gnetophytes) | <input type="checkbox"/> | Scaphopoda (Tooth Shells) | <input type="checkbox"/> | Hymenoptera (Ants, Bees, Wasps, Sawflies) |
| <input type="checkbox"/> | ANGIOSPERMS | <input type="checkbox"/> | Gastropoda (Snails, Slugs, Limpets) | <input type="checkbox"/> | Chilopoda (Centipedes) |
| <input type="checkbox"/> | Monocots | <input type="checkbox"/> | Pelecypoda (Bivalvia) (Clams, Mussels, Oysters, Scallops) | <input type="checkbox"/> | Diplopoda (Millipedes) |
| <input type="checkbox"/> | Arecaceae (Palmae) | <input type="checkbox"/> | Cephalopoda (Squid, Octopus, Nautilus) | <input type="checkbox"/> | Pauropoda |
| <input type="checkbox"/> | Cyperaceae | <input type="checkbox"/> | ANNELIDA (Segmented Worms) | <input type="checkbox"/> | Symphyla (Symphyla) |
| <input type="checkbox"/> | Liliaceae | <input type="checkbox"/> | Polychaeta (Parapodial Worms) | <input type="checkbox"/> | PENTASTOMIDA (Linguatulida) (Tongue Worms) |
| <input type="checkbox"/> | Orchidaceae | <input type="checkbox"/> | Oligochaeta (Earthworms) | <input type="checkbox"/> | TARDIGRADA (Tardigrades, Water Bears) |
| <input type="checkbox"/> | Poaceae (Graminae) | <input type="checkbox"/> | Hirudinida (Leeches) | <input type="checkbox"/> | ONYCHOPHORA (Peripatus) |
| <input type="checkbox"/> | Dicots | <input type="checkbox"/> | POGONOPHORA (Beard Worms) | <input type="checkbox"/> | CHAETOGNATHA (Arrow Worms) |
| <input type="checkbox"/> | Apiaceae (Umbelliferae) | <input type="checkbox"/> | SIPUNCULOIDEA (Peanut Worms) | <input type="checkbox"/> | ECHINODERMATA |
| <input type="checkbox"/> | Asteraceae (Compositae) | <input type="checkbox"/> | ECHIUROIDEA (Spoon Worms) | <input type="checkbox"/> | Crinoidea (Sea Lilies, Feather Stars) |
| <input type="checkbox"/> | Brassicaceae (Cruciferae) | <input type="checkbox"/> | ARTHROPODA | <input type="checkbox"/> | Asteroidea (Starfish, Sea Stars) |
| <input type="checkbox"/> | Fabaceae (Leguminosae) | <input type="checkbox"/> | Cheliceriformes | <input type="checkbox"/> | Ophiuroidea (Brittle Stars, Serpent Stars) |
| <input type="checkbox"/> | Lamiaceae (Labiatae) | <input type="checkbox"/> | Merostomata (Horseshoe Crabs) | <input type="checkbox"/> | Echinoidea (Sea Urchins, Sand Dollars) |
| <input type="checkbox"/> | Rosaceae | <input type="checkbox"/> | Pycnogonida (Sea Spiders) | <input type="checkbox"/> | Holothuroidea (Sea Cucumbers) |
| <input type="checkbox"/> | Solanaceae | <input type="checkbox"/> | Scorpionida (Scorpions) | <input type="checkbox"/> | HEMICHORDATA (Acorn Worms, Pterobranchs) |
| <input checked="" type="checkbox"/> | ANIMALS | <input type="checkbox"/> | Araneae (True Spiders) | <input type="checkbox"/> | UROCHORDATA (Tunicata) (Tunicates, Sea Squirts, Salps, Ascideans) |
| <input type="checkbox"/> | INVERTEBRATES | <input type="checkbox"/> | Pseudoscorpionida (Pseudoscorpions) | <input type="checkbox"/> | CEPHALOCHORDATA (Amphioxus/Lancelet) |
| <input type="checkbox"/> | MESOZOA/PLACOZOA | <input type="checkbox"/> | Acarina (Free-living Mites) | <input type="checkbox"/> | VERTEBRATES |
| <input type="checkbox"/> | PORIFERA (Sponges) | <input type="checkbox"/> | Parasitiformes (Parasitic Ticks & Mites) | <input type="checkbox"/> | AGNATHA (Hagfish, Lamprey) |
| <input type="checkbox"/> | CNIDARIA | <input type="checkbox"/> | Crustacea | <input type="checkbox"/> | FISHES |
| <input type="checkbox"/> | Hydrozoa (Hydra, etc.) | <input type="checkbox"/> | Branchiopoda (Fairy Shrimp, Water Flea) | <input type="checkbox"/> | Chondrichthyes (Cartilaginous Fishes) (Sharks, Rays, Ratfish) |
| <input type="checkbox"/> | Scyphozoa (Jellyfish) | <input type="checkbox"/> | Ostracoda (Sea Lice) | <input type="checkbox"/> | Osteichthyes (Bony Fishes) |
| <input type="checkbox"/> | Anthozoa (Corals, Sea Anemones) | <input type="checkbox"/> | Copepoda | <input type="checkbox"/> | AMPHIBIA |
| <input type="checkbox"/> | CTENOPHORA (Comb Jellies) | <input type="checkbox"/> | Cirripedia (Barnacles) | <input type="checkbox"/> | Anura (Frogs, Toads) |
| <input type="checkbox"/> | PLATYHELMINTHES (Flatworms) | <input type="checkbox"/> | Amphipoda (Skeleton Shrimp, Whale Lice, Freshwater Shrimp) | <input type="checkbox"/> | Urodela (Salamanders, Newts) |
| <input type="checkbox"/> | Turbellaria (Planarians) | <input type="checkbox"/> | Isopoda (Wood Lice, Pillbugs) | <input type="checkbox"/> | Gymnophiona (Apoda) (Caecilians) |
| <input type="checkbox"/> | Trematoda (Flukes) | <input type="checkbox"/> | Decapoda (Lobster, Crayfish, Crabs, Shrimp) | <input type="checkbox"/> | REPTILIA |
| <input type="checkbox"/> | Cestoda (Tapeworms) | <input type="checkbox"/> | Hexapoda (Insecta) (Insects) | <input type="checkbox"/> | Chelonia (Turtles, Tortoises) |
| <input type="checkbox"/> | Monogenea (Flukes) | <input type="checkbox"/> | Apterygota (Springtails, Silverfish, etc.) | <input type="checkbox"/> | Serpentes (Snakes) |
| <input type="checkbox"/> | GNATHOSTOMULIDA | <input type="checkbox"/> | Odonata (Dragonflies, Damselflies) | <input type="checkbox"/> | Sauria (Lizards) |
| <input type="checkbox"/> | NEMERTINEA (Rynchozoela) (Ribbon Worms) | <input type="checkbox"/> | Ephemeroptera (Mayflies) | <input type="checkbox"/> | Crocodylia (Crocodilians) |
| <input type="checkbox"/> | ENTOPROCTA (Bryozoa) (Plant-like Animals) | <input type="checkbox"/> | Orthoptera (Grasshoppers, Crickets) | <input type="checkbox"/> | AVES (Birds) |
| <input type="checkbox"/> | ASCHELMINTHES | <input type="checkbox"/> | Dictyoptera (Cockroaches, Mantids, Phasmids) | <input type="checkbox"/> | Passeriformes (Passerines) |
| <input type="checkbox"/> | Gastrotricha | <input type="checkbox"/> | Isoptera (Termites) | <input type="checkbox"/> | MAMMALIA |
| <input type="checkbox"/> | Kinorhyncha | <input type="checkbox"/> | Plecoptera (Stoneflies) | <input type="checkbox"/> | Monotremata (Platypus, Echidna) |
| <input type="checkbox"/> | Loricifera | <input type="checkbox"/> | Phthiraptera (Mallophaga & Anoplura) (Lice) | <input type="checkbox"/> | Marsupialia (Marsupials) |
| <input type="checkbox"/> | Nematoda (Roundworms) | <input type="checkbox"/> | Hemiptera (including Heteroptera) (True Bugs) | <input type="checkbox"/> | Eutheria (Placentals) |
| <input type="checkbox"/> | Nematomorpha (Horsehair Worms) | <input type="checkbox"/> | Homoptera (Cicadas, Scale Insects, Leafhoppers) | <input type="checkbox"/> | Insectivora (Hedgehogs, Moles, Shrews, Tenrec, etc.) |
| <input type="checkbox"/> | Rotifera (Rotatoria) | <input type="checkbox"/> | Thysanoptera (Thrips) | <input type="checkbox"/> | Chiroptera (Bats) |
| <input type="checkbox"/> | ACANTHOCEPHALA (Spiny-headed Worms) | <input type="checkbox"/> | Neuroptera (Lacewings, Dobsonflies, Snakeflies) | <input type="checkbox"/> | Primates |
| <input type="checkbox"/> | PRIAPULOIDEA | <input type="checkbox"/> | Trichoptera (Caddisflies) | <input type="checkbox"/> | Humans |
| <input type="checkbox"/> | BRYOZOA (Ectoprocta) (Plant-like Animals) | <input type="checkbox"/> | Lepidoptera (Moths, Butterflies) | <input type="checkbox"/> | Rodentia |
| <input type="checkbox"/> | PHORONIDEA (Lophophorates) | <input type="checkbox"/> | Diptera (Flies, Mosquitoes) | <input type="checkbox"/> | Lagomorphs (Rabbits, Hares, Pikas) |
| <input type="checkbox"/> | BRACHIOPODA (Lamp Shells) | <input type="checkbox"/> | Siphonaptera (Fleas) | <input type="checkbox"/> | Carnivora (Bears, Canids, Felids, Mustelids, Viverrids, Hyena, Procyonids) |
| <input type="checkbox"/> | MOLLUSCA | | | <input type="checkbox"/> | Perissodactyla (Odd-toed Ungulates) (Horses, Rhinos, Tapirs, etc.) |
| <input type="checkbox"/> | Monoplacophora | | | | |
| <input type="checkbox"/> | Aplacophora (Solenogasters) | | | | |

| | | |
|---|---|---------------------------------------|
| <input type="checkbox"/> Artiodactyla (Even-toed Ungulates) (Cattle, Sheep, Deer, Pigs, etc.) | <input type="checkbox"/> TRANSGENIC ORGANISMS <input type="checkbox"/> FOSSIL OR EXTINCT ORGANISMS | <input type="checkbox"/> NO ORGANISMS |
| <input type="checkbox"/> Marine Mammals (Seals, Walrus, Whales, Otters, Dolphins, Porpoises) | | |

CATEGORY VIII: MODEL ORGANISM (Select ONE)

| | | |
|--|--|---|
| <input checked="" type="checkbox"/> NO MODEL ORGANISM MODEL ORGANISM (Choose from the list) | <input type="checkbox"/> Escherichia coli <input type="checkbox"/> Mouse-Ear Cress (Arabidopsis thaliana) | <input type="checkbox"/> Fruitfly (Drosophila melanogaster) |
|--|--|---|

Summary

The National Center for Ecological Analysis and Synthesis (NCEAS) was established in 1995 in recognition of the need for a facility where ecologists and scientists in allied disciplines could collaborate to conduct multidisciplinary research. The Center's mission is to advance the state of ecological knowledge through the use of existing information, organize and synthesize ecological information to make it useful to all users, and to influence the way in which ecological research is conducted by promoting a culture of synthesis and collaboration.

The Center supports three primary modes of research – working groups (2-20 individuals interacting to address important questions), Postdoctoral Associates (15-18 per year) and Center Fellows (4-6 sabbatical visitors per year). Because research at NCEAS relies on using existing information, the Center is involved with many collaborators to develop generic data access tools for a broad user community, from student and resource managers to scientists (www.nceas.ucsb.edu/ecoinformatics).

Intellectual merit – The productivity and significance of research results from NCEAS activities have been high. More than 1,000 scientific articles, many in top-flight journals, have been published along with 26 books. NCEAS is currently in the top 1% (338th out of more than 38,000) of institutions in the world in total citations in ecology and the environment and, more importantly, is ranked 22nd in citations/article. The articles have been published in more than 200 different journals, and many disciplines have been represented in research projects. The Postdoctoral Associates have received many awards including, in one 18-month period, the top young scientist awards from three different scientific societies. Sociologists studying NCEAS have discovered that the NCEAS environment promotes a level of productive collaboration that is 2.5 times higher than the average for all other groups analyzed.

Broader Impacts - A broad array of individuals have been involved at NCEAS. The Center has hosted 3,466 different scientists from 49 states, the District of Columbia, Puerto Rico, and 49 different countries. More than 531 academic institutions have been involved (24.8% of which are non-PhD granting) as well as 428 non-academic institutions (NGOs, agencies, private companies). The participants belong to more than 360 scholarly societies and participation by academic rank, geographic location, and gender match typical scientific settings. The Center is very open, with 85% of the participants visiting NCEAS 4 times (the average number of meetings for a Working Group); 74% of the participants in 2004 were first-time visitors. The Center has hosted 37 graduate interns, 27 others have been supported at their home institutions as part of Working Groups, and more than 700 graduate students from around the world have been involved in distributed graduate seminars.

As indicated above, the Center's impact on ecology and allied disciplines has been transformative. Accordingly, NCEAS proposes to continue its core activities while refining a number of elements to increase participation by underrepresented populations and graduate students, increase technical support and data access, and raise awareness of NCEAS in those disciplines that may be less familiar with the Center's opportunities. In addition, NCEAS will increase its training efforts in ecoinformatics, increase its role in influencing the culture of science, and extend its model of collaboration to areas of conservation, resource management, and social sciences pertinent to ecology (e.g., economics).

NCEAS is a unique institution with an explicit mission to foster synthesis and analysis and turn information into knowledge. Based on its record of achievement, breadth of activities, impact of results, and unique opportunities for future leadership, the National Center for Ecological Analysis and Synthesis requests support for an additional five or more years.

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*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

Results from Prior NSF Support

NSF Award Number: 0072909

Amount: \$16,653,400

Period of Support: 8/1/2000 – 7/31/2006

Title: Center for Ecological Analysis and Synthesis

Summary of Results: Since 1995 the National Center for Ecological Analysis and Synthesis (NCEAS) has hosted 3,466 individuals and supported 363 projects that have yielded more than 1,000 scientific articles (www.nceas.ucsb.edu). The projects have produced a wide array of outcomes, from specific results to general knowledge about our discipline and its application to the management of resources. The Center has engaged hundreds of graduate students and grade school children, and has developed information access tools that are becoming the standard for the discipline.

The evidence suggests that NCEAS is accomplishing its mission and effectively addressing its goals. Specifically, the Center:

- ▶ Generates important research in significant quantities
- ▶ Provides unique opportunities for ecologists and scientists in allied disciplines to concentrate on important scientific questions and interact in distinctive ways
- ▶ Serves an extremely broad community and is open to all interested parties
- ▶ Promotes a new culture of synthesis and collaboration
- ▶ Adds value to existing data by increasing its access and facilitating analysis

Intellectual Merit – NCEAS supports Working Groups, Postdoctoral Associates, and Center Fellows (sabbaticals). These activities have been productive and innovative by any standard, fostering synthesis and collaboration to make contributions that are both broad and deep. In lieu of anecdotally reviewing a few research projects, we present some key statistics and highlights.

Productivity, Significance

- More than 1,000 publications, many in *Science* (41), *Nature* (26), *PNAS* (21), and *TREE* (24; see complete list on NCEAS web site) and 26 Books
- Average impact factor for journals in which articles from NCEAS projects are published is 7.1 compared to 3.5 for *Ecology*
- NCEAS is in the top **1%** (ranked 338th) of more than 38,000 scientific institutions in total citations in ecology and the environment (this is a significant underestimate because ISI citations are identified by the addresses of the authors, and as many as 65% of NCEAS articles were missed because most papers acknowledge NCEAS but do not include an NCEAS address)
 - NCEAS is ranked **22nd** (out of more than 38,000 institutions) in citations/article
 - 5% of the articles in *Ecology* in the last 3 years acknowledge NCEAS

Table 1. Selected high-impact articles (number of citations to article in left column; more recent articles have not accumulated enough citations to be on to this list)

| | |
|-----|--|
| 678 | Costanza, et al. 1997. The value of the world's ecosystem services and natural capital. <i>Nature</i> . Vol: 387(6230). Pages 253-261. |
| 339 | Jackson, et al. 2001. Historical overfishing and the recent collapse of coastal ecosystems. |

| | |
|-----|---|
| | Science. Vol: 293. Pages 629-638. |
| 337 | Curtis, P., and X. Wang, 1998. A meta-analysis of elevated CO2 effects on woody plant mass, form, and physiology. <i>Oecologia</i> . Vol: 113(3). Pages 299-313. |
| 272 | Sala, et al. 2000. Global biodiversity scenarios for the year 2100. <i>Science</i> . Vol: 287. Pages 1770-1774. |
| 250 | Loreau, et al.. 2001. Biodiversity and ecosystem functioning: Current knowledge and future challenges. <i>Science</i> . Vol: 294. Pages 804-808. |
| 217 | Waide, et al. 1999. The relationship between primary productivity and species richness. <i>Annual Review of Ecology and Systematics</i> . Vol: 30. Pages 257-300. |
| 180 | Crandall, et al. 2000. Considering evolutionary processes in conservation biology. <i>TREE</i> . Vol: 15. Pages 290-295. |
| 177 | Parmesan, et al.. 1999. Poleward shifts in geographical ranges of butterfly species associated with regional warming. <i>Nature</i> . Vol: 399. Pages 579-583. |
| 177 | Chapin, at al. 1997. Biotic controls over the functioning of ecosystems. <i>Science</i> . Vol: 277. Pages 500-504. |
| 149 | Easterling, et al. 2000. Climate extremes: Observations, modeling, and impacts. <i>Science</i> . Vol: 289. Pages 2068-2074. |

Breadth of Research – Results from NCEAS projects extend far outside the core of ecology topically, with regard to where results are published, and diversity of participants (see below):

- NCEAS articles have been published in 200+ different journals
- NCEAS projects have represented eight different sciences (Biology, Geology, Engineering, etc.) and 56 scientific subdisciplines
- NCEAS has attracted projects pertaining to ecology from outside the natural sciences, most notably economics, philosophy, and sociology

Postdoctoral Research: Developing a new generation of Scientists – The Postdoctoral Associates at NCEAS are chosen from a highly diverse, competitive applicant pool and represent some of the best young scientists in the world. At NCEAS they are mentored in a new culture of collaboration, synthesis, and interdisciplinary research, allowing their scholarship to flourish.

- During one 18-month period Postdoctoral Associates received the top awards for young scientists from the Ecological Society of America, the American Society of Naturalists, and the American Society of Limnology and Oceanography
- Since then several have received Young Investigator Awards, and one the ASN President’s Award; other awards include the Buell award (best paper by a graduate student) the Tom Frost award (best paper in limnology by a young scientist), and the W. S. Cooper Award (outstanding contributor to the field of geobotany from ESA)
- Postdoctoral Associates are frequently offered numerous interviews; 85% have career positions at major institutions and 6% have chosen second postdoctoral positions
- Several NCEAS Postdoctoral Associates have been supported outside the Center’s base funding, including one NSF Fellowship, two Nature Conservancy Smith Fellows, seven from private foundations, and others with support from their home countries

Research in support of conservation and resource management – As a reflection of the ecological community’s commitment to solving problems that meet societal needs, over 25% of

the projects at NCEAS include as goals informing environmental policy and management. NCEAS is an asset because it can move quickly to provide a forum for analysis and synthesis.

- NCEAS participants have come from 217 different public agencies (local, national and international) and 99 different non-governmental organizations, most of which focus on conservation and resource management

- NCEAS' Science Advisory Board includes leaders from NGOs and federal resource management agencies

- Postdoctoral Associates have included two Smith Fellows from The Nature Conservancy; the Center has supported sabbatical fellows from the US Forest Service and NGOs, and currently hosts a conservation outreach associate from SeaWeb

- The distinctive interactions between empiricist, theoreticians, and resource managers have been important in many NCEAS projects, such as:

- Working groups on marine reserves helped make marine protected areas a widely embraced fisheries management tool in the United States, and were instrumental in establishing a new reserve system in the Santa Barbara Channel Marine Sanctuary

- Reviews of Habitat Conservation Plans (HCPs) Under the Endangered Species Act, and the Use of Science in Recovery Plans Under the Endangered Species Act inspired new training materials for USFWS biologists and prompted the government to produce an online library of recovery plans

- Workshops aimed at improving our methods for estimating extinction risk led NatureServe to alter its species prioritization protocol and generated recommendations being considered by IUCN for revised listing criteria. A user-friendly handbook on Population Viability Analysis has been distributed throughout the NGO world, and was even translated into French for use in Canada in 2005

- The management plan for Kruger National Park (South Africa) was significantly altered after biologists from South Africa uncovered new relationships between fire and climate during workshops and training in ecoinformatics

Ecoinformatics Research – Ecological data are widely dispersed and profoundly heterogeneous, such that researchers face major obstacles when using existing data to address important ecological questions. NCEAS has become a leader in developing collaborations and technical solutions to overcome these obstacles by providing generic access tools for more efficient and powerful access and analysis of ecological data (nceas.ucsb.edu/ecoinformatics). Because NCEAS is based on using existing data, the Center contributes to supporting ecoinformatics research. In addition, NCEAS and many collaborators have obtained significant funding (from NSF and private foundations) for a dozen ecoinformatics research projects including:

- Knowledge Network for Biocomplexity (KNB; knb.ecoinformatics.org) – a multi-institutional collaboration of ecologists with technologists that produced a structured metadata format for ecological data (EML), software to generate this format (Morpho), and a robust metadata and data management system (Metacat) that enables researchers to participate in a distributed global network of Data Repositories

- Science Environment of Ecological Knowledge (SEEK; seek.ecoinformatics.org) – a multi-institutional collaboration of ecologists, systematists, and computer scientists for research on scientific workflow modeling (Kepler; kepler-project.org), and the development of Ecogrid (a network of networks of ecologically-relevant data and analytical components). This project incorporates cutting-edge advances in semantic mediation and knowledge representation

- Development and support of data registries, used by a growing number of organizations and recently adopted by the Ecological Society of America to allow authors to register data associated with their journal articles
- Curriculum development and training in ecoinformatics in the form of Workshops, mini-conferences (targeted at information managers, academic and agency scientists, postdoctoral and early career faculty), and activities directed toward NCEAS visitors
- NCEAS has significantly expanded access to data associated directly with Center projects, and facilitated other projects providing entree to large data holdings, including:
 - NCEAS Data Repository – standards-based documentation of metadata and data from synthesis projects arising at NCEAS (data.nceas.ucsb.edu)
 - LTER Data Catalog – collaboration with LTER Data Managers and Network Office to develop metadata standards and promote search capabilities of data and metadata
 - Interaction Web Database (nceas.ucsb.edu/interactionweb) – web-based data access and submissions concerning ecological interactions, particularly pollination
 - Global Population Dynamics database (cpbnts1.bio.ic.ac.uk/gpdd) – extensive data on time series, hosted by the Center for Population Biology at Silwood Park, and co-developed with NCEAS
 - Kruger National Park, South Africa – collaboration to develop effective informatics solutions for data collected within the park, for scientists and public access
 - VegBank (vegbank.org) – standardized database for vegetation plot data, collected on a national scale, and done in conjunction with the ESA Vegetation committee.
 - Paleobiology Database – Web-based resource (led by Dr. John Alroy, an early NCEAS Postdoctoral Associate; paleodb.org) of fossil information that includes 52,000 collection records and 511,889 taxonomic occurrences from 13,962 published references

Broader Impacts - Community Participation, Outreach, Education, Training - NCEAS is an open institution, supporting scholars from many disciplines along many axes of interest. One of the major benefits of a synthesis center is the engagement of thousands of scientists and students.

Breadth of Participation, Openness – The reach of research at NCEAS extends well outside the core discipline of ecology.

- **3,466** participants have been involved in NCEAS research activities, including 242 working groups, 66 Postdoctoral Associates, 63 Center Fellows (sabbaticals), and many graduate students (37 resident interns, 27 interns at other institutions, and hundreds in Distributed Graduate Seminars; see below)
- NCEAS participants are from 49 states, Washington DC, Puerto Rico and 49 countries (18% of participants are from outside the U.S.)
- More than **531** academic institutions (**24.8%** of which are non-PhD-granting), and **428** non-academic entities (companies, NGOs, agencies) have been represented at NCEAS.
- Participants belong to more than 360 scholarly societies
- Overall gender representation matches that of the Ecological Society of America, with junior cohorts having significantly more women than senior cohorts
- The Center has collaborated with scores of other entities representing many different interests (www.nceas.ucsb.edu/fmt/doc?nceas-web/collaborators)

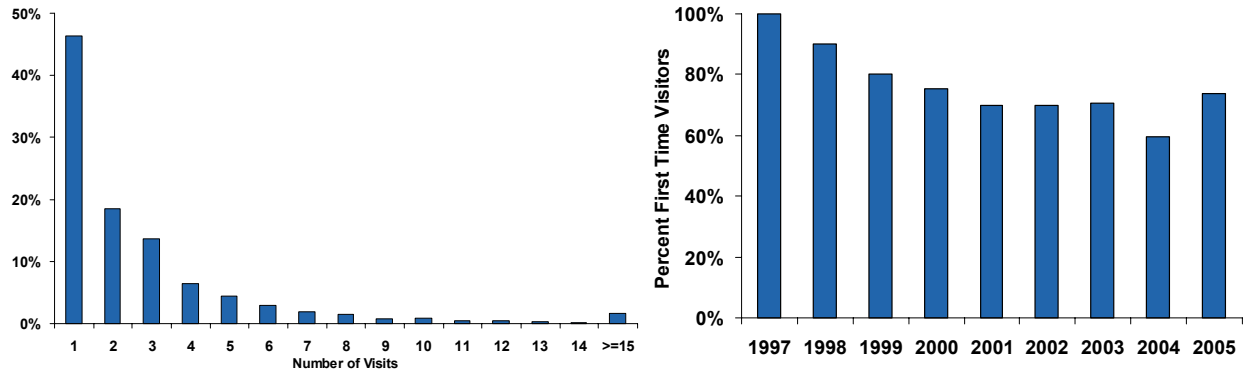


Figure 1. The proportions of the number of times individuals have visited NCEAS (left panel) and the percent of first time visitors to NCEAS (right panel), indicating that the Center remains open and is not used by only a small group of scholars.

- **85%** of participants have been to NCEAS four times or fewer (the average number of meetings for a Working Group (Fig. 1))
- Even after 10 years and 3,500 visitors, **74%** of participants in the last year were first-time participants (Fig 1)

Outreach, Education and Training – NCEAS employs several distinctive approaches to education and outreach.

- The Center is the “database manager” for the local 5th grade natural science program (Los Marineros); 75% of the students are Hispanic (www.nceas.ucsb.edu/nceas-web/kids)
- Hundreds of graduate and undergraduate students have been involved in NCEAS research activities
- NCEAS participates in ecoinformatics training of junior and senior scientists in workshops with external collaborators (notably the LTER Network Office) and with each working group that passes through NCEAS
- NCEAS scientists and staff members participate in dozens of meetings around the world to promote synthesis, analysis, and ecoinformatics, and to assist in the development of other synthesis activities and centers

Change in Culture – Multiple measures indicate that NCEAS is promoting a distinctive culture of collaboration.

- The average number of authors on NCEAS articles is significantly higher, and the percent of NCEAS articles with a single author is significantly lower, than the average for articles in *Ecology*
- Many of the collaborations continue well after NCEAS projects are completed and yield additional research papers and collaborative research proposals
- In projects funded by NSF, sociologists discovered that the NCEAS model promotes a higher level of productive collaboration (interaction density of 50%, 2.5 times higher than the average for other groups that have been analyzed) than other, more typical, models (such as in situ, resident centers; www.nceas.ucsb.edu/fmt/doc/?nceas-web/center/renewal2005)

Introduction

Deep analysis, synthesis, and collaborative, interdisciplinary research are emerging as major elements of contemporary approaches to science, especially in ecology. Although these approaches have been extant for some time, NCEAS catalyzed a form of institutional support for analysis and synthesis that involves interdisciplinary researchers focusing on important questions in ecology and allied disciplines. As a hub for this successful model of ecological research we propose to continue fostering transformative, multidisciplinary collaboration by supporting Working Groups, Postdoctoral Associates, and Center Fellows visitors while emphasizing graduate student involvement and ecoinformatics training. In addition, we propose to expand these efforts, deploy the NCEAS model in conservation and resource management, more fully engage those social sciences that pertain to ecology (e.g., ecological economics), and participate in emerging programmatic areas involving large collaborative research projects.

Ecology is a diverse and heterogeneous discipline and thus benefits from analysis (the examination of ecological patterns and processes using existing data, computer models and simulations, analytical models, and theory) and synthesis (the confederation of data and the integration of ideas, concepts, and theories). This heterogeneity led to the recognition of a need for a synthesis center to provide a facility where scholars use existing data to address important ecological questions. Many of the collaborations involve empiricists, theoreticians, modelers or other analytically adept colleagues who take advantage of each others knowledge and skills.

Research by individuals and small groups is still the primary source of information about the patterns and processes of the natural world. One of the greatest advantages of the NCEAS model is the value it adds to the core contributions of thousands of scientists around the world. Playing a pivotal role in the modern era of synthesis, collaboration, and multidisciplinary research, NCEAS facilitates leveraging data and information into knowledge.

NCEAS began operation May 1, 1995, under the guidance of the original PIs William Murdoch (who served as interim Director for the first year) and Michael Goodchild. The Center was funded initially for five years and in 2000 received support for an additional six years. In Spring, 2004 a site visit report recommended that NCEAS be offered an opportunity for a non-competitive renewal proposal for an additional five years of support.

The Center supports Working Groups (approximately a dozen scientists who come to NCEAS to concentrate on specific issues that require in depth analysis of data and synthesis of ideas), up to six Fellows and 15-18 Postdoctoral Associates in residence each year (Fig. 2).

The Center has a permanent staff of 13 FTE's, split between administrative and IT support. The Science Advisory Board (SAB), which provides guidance on specific proposals, research activities, and strategic matters, is composed of 19 members (with three-year terms) drawn from

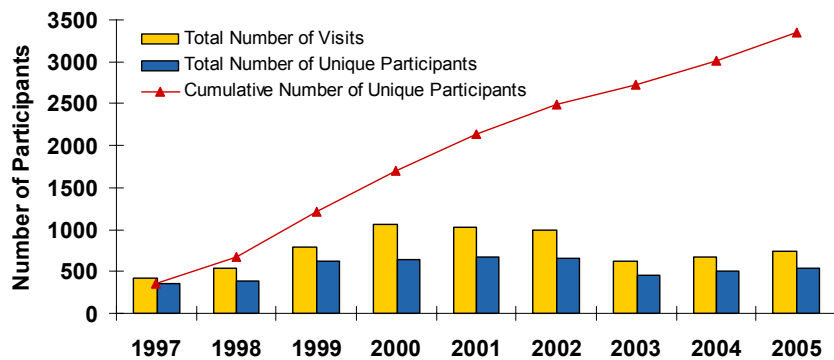


Figure 2. The total number of visits and total number of unique participants each year (some participants visit more than once/year), and the cumulative number of unique visitors (totaling 3466).

appropriate disciplines and organizations. The SAB usually includes several foreign scientists, and non-ecologists (e.g., economists) and agency scientists.

NCEAS Vision and Mission

Our vision for NCEAS is to enhance its effectiveness as the premier synthesis and analysis facility serving ecology and allied disciplines. We want the Center to reflect the breadth of diversity of both the discipline and its practitioners by continuing to address its mission, which is to:

- *Advance the state of ecological knowledge through the search for general patterns and principles*
- *Organize and synthesize ecological information in a manner useful to researchers, resource managers, and policy makers addressing important environmental issues*
- *Influence the way ecological research is conducted and promote a culture of synthesis and collaboration*

NCEAS operates under five goals established early in the Center's development:

1. *Develop opportunities that accelerate and initiate paradigms* – It is difficult to identify *a priori* those topics that yield important advances in a discipline. However, an effective approach is to employ an operational model, establish an intellectual atmosphere, and provide a physical setting that maximize the likelihood that important research will be conducted. Evidence suggests that NCEAS regularly catalyzes or accelerates advances in ecology.

2. *Make NCEAS the facility where scientists look to support analysis and synthesis of existing ecological information using creative approaches* – The number of proposals submitted to NCEAS continues to increase (~ 90 proposals are received annually representing more than 700 individuals; Fig. 3), 36% of which are supported.

The number of unique visitors, the breadth of the disciplines they represent, and the range in academic rank and scope of their home institutions suggest that the Center is broadly known and utilized.

3. *Maintain a Center with an international character and broad interests* – The Center has broad geographic, institutional, and intellectual representation - 18% of NCEAS visitors are international, coming from 49 countries. Research at the Center spans all aspects of ecology and many adjacent disciplines and, because NCEAS focuses on supporting collaboration the Center is viewed as independent of any area, habitat, taxon, or point of view.

4. *Provide information to scientists, managers, and policy makers* – NCEAS research depends on large amounts of widely dispersed and heterogeneous data. Accordingly, the Center

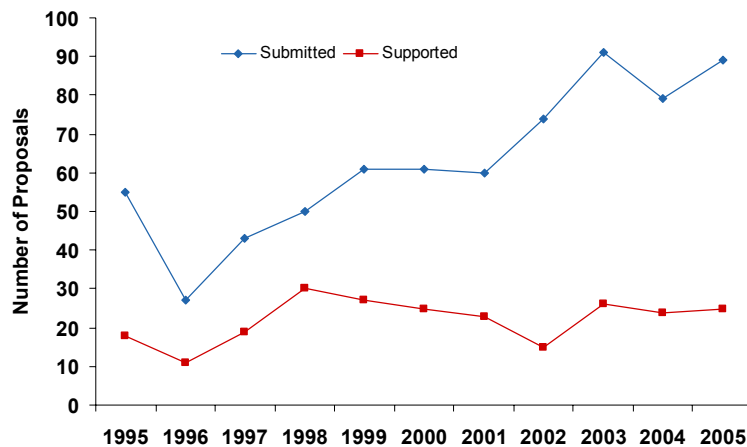


Figure 3. Number of proposals submitted and awarded each year. Note that the submissions continue to climb while the number supported remains unchanged.

has been a leader in developing expertise and tools for managing ecological information. In addition, the Center employs two full-time staff members to assist resident and visiting scientists with data management and analytical needs. These efforts add value to existing data and information by increasing its access and use to generate new knowledge.

5. *Maintain a Center that provides flexible, convenient support for visiting scientists* – NCEAS is flexible both operationally (scheduling Working Groups, supporting visiting and resident scientists, providing customized computing support) and scientifically (allowing projects to evolve toward newly discovered questions and approaches). This flexibility promotes an interest and willingness to take on a major research effort, and leads to effective collaboration by lowering the activation energy required to initiate a project.

Distinctive Strengths of NCEAS

The NCEAS model is simple – facilitate opportunities for synthesis and analysis through collaboration by providing logistic assistance, a place for interactions, computational capabilities, and a scholarly atmosphere. NCEAS’ unique combination of strengths contribute to its success – a specific mission and vision, adaptability, a flat, effective structure, a dedicated, experienced staff, comfortable facilities, and a collective experience in promoting collaboration.

Interactions – Organized interactions through Working Groups represent one of the formal activities at NCEAS. Working Group meetings often are loosely structured but typically evolve rapidly toward productive aspects of the research question. Resident scientists (sabbatical Fellows and Postdoctoral Associates) interact with each other and the hundreds of visiting scientists that come through the Center each year. While many of the interactions are planned, others are serendipitous. These anticipated but unpredictable interactions take place between and among resident and visiting scientists, resulting in significant new research collaborations. This intellectual by-catch results when individuals discover they have a shared interest in a topic that may be unrelated to the purpose for which either came to NCEAS. Studies by sociologists suggest that the NCEAS model yields interactions that are more productive than other models (such as resident centers; www.nceas.ucsb.edu/fmt/doc/?nceas-web/center/renewal2005).

Time – Productive scientists are very busy and obligations at their home institutions often preclude concentration of research efforts, even for the most junior researchers. Visits to the Center allow scientists to focus on research in creative, productive bursts of intellectual activity.

Flexibility and Creativity – NCEAS research projects rarely end up as proposed. In the intellectually open atmosphere engendered at NCEAS, scientists naturally move toward the most interesting and productive areas of inquiry. The Center often supports changes in the direction of a group by funding an additional participant(s) or meeting when the group discovers important opportunities. The flexibility provided to NCEAS projects fosters innovation and creativity.

Multidisciplinarity – The diversity of participation at NCEAS is extremely broad on several axes – discipline, background, type of institutions, age and rank, etc. Importantly, a diverse array of approaches is brought together at NCEAS (e.g., theory and empiricism, research and resource management).

Service, accommodation, facilitation – The location, facilities, and ambience at NCEAS contribute significantly to its success. The Center’s location makes it easy to move between lodging and meeting rooms on flexible schedules, which often include evenings and weekends. More abstractly, the Center serves as a “distant, neutral location,” something sociologists studying NCEAS have reported is an important factor in its success. That is, there is no home team at NCEAS, rather, visitors come from around the world and are on equal footing with other

participants. Perhaps surprisingly, being away from a campus promotes productive interactions. As one resident scientist said “people are here to do this,” meaning they come to NCEAS to do analysis and synthesis. Others have remarked that they “think differently” at NCEAS.

As pleasant as the facility is, it is the staff and their earnest interest in helping resident and visiting scientists that most impresses visitors (the single most common comment we receive is about the quality of the staff). They are service-oriented, and go out of their way to minimize the effort required to conduct research at NCEAS. The logistics of accommodating hundreds of people per year – travel, visas, lodging, special requirements – are significant, and the staff is responsible for maintaining the productive atmosphere of the Center.

Computing and Information Technology Support – NCEAS faces a number of unique challenges in information technology. With 800-1000 visits from hundreds of different individuals per year and a resident population of two dozen researchers -- all analyzing complex data from multiple sources, NCEAS must maintain a high-performance technology infrastructure and assist NCEAS clients in using it in a timely manner. The highly trained staff maintains Internet services such as email, Web site, shared file systems, a large library of scientific software, and well-equipped desktop systems throughout our facility and routinely deals with virus-infected laptops, establishing hi-speed network links to home campus resources, creating accounts, and configuring wireless access. Extensive support is provided to the administrative staff, and a large administrative database is maintained.

Because of NCEAS’ emphasis on using existing information, we have a deep commitment to developing means to locate, access, analyze, and make broadly available data pertinent to ecology and to imbue scientists and other users with a strong sense of sharing information. Accordingly, the Center has focused, with many collaborators, on developing generic data access tools. While this work has been largely supported external to NCEAS base funding, internally the Center’s IT leaders are actively involved in ecoinformatics research, ensuring that NCEAS is both a contributor to and recipient of emerging information management capabilities. Concurrently, the Center provides comprehensive in-house capabilities (e.g., two full-time technical analysts), including support and training for resident and visiting scientists. As a result, NCEAS scientists are becoming familiar with the skills of information management and developing a sense of its importance to their research. Training is enhanced because the Center is often viewed as a neutral party, dedicated to the general notion of data access rather than focusing on one type of data or approach.

Proposed Activities

NCEAS was initiated as an experiment. The goal was to catalyze collaborative research focused on existing information, and promote the transformation of ecology and allied disciplines by providing a new means to facilitate research. Evidence suggests that NCEAS has been exceptionally successful addressing its mission and is embraced by the user community.

In preparation for a renewal proposal, we conducted a strategic planning effort that involved the Science Advisory Board, campus officials, selected visitors to NCEAS, the Center’s staff, and an analysis of recommendations from the two most recent reviews of NCEAS. Consideration was given to the nature and scope of existing activities and potential additions to the NCEAS portfolio. Concurrently, the influence of any changes on the structure and operations of NCEAS was evaluated, and the means to support existing and new activities were examined. The results revealed that the basic research activities of the Center remain effective and would benefit from several enhancements suggested by previous reviews and the strategic

planning. Furthermore, it was clear that the NCEAS model could, and should, be expanded into additional areas of interest.

Enhancement to existing activities – The three major research approaches at NCEAS are effective and well received by the user community. Therefore, we propose to continue supporting these activities while refining some of their features (Fig. 4). The proposed refinements come from both our own observations and from recommendations in recent (2002, 2004) site reviews. All of the major issues presented in those reviews have been addressed, as follows:

-- *Increase support for informatics* –

NCEAS has had one analytical support position since 2000, and recently received private funding for a second position. We will continue to seek private funding, while budgeting funds in this proposal for support to ensure its continuance. The individuals assist scientists with data management and analysis, track the deposition of data in our open access areas, and log their interactions with groups and individuals. We have also added a section asking about technical services to our semi-annual questionnaire.

-- *Increase data access* – NCEAS has worked in a number of collaborations to develop tools for generic access to data. Our plan has been to wait until these tools are useful and easily used before broadly deploying them. We are now deploying the tools (e.g., the Ecological Society of America recently adopted a data registry developed by NCEAS and others; see the Results From Prior Support for information about data accessibility) while continuing research on additional capabilities.

-- *Increase awareness of NCEAS* – The last two reviews of NCEAS have indicated a perception that NCEAS is not open to all applicants. The data show otherwise (see Results From Prior Support above), and the reviewers recognized that it is a perception, not a reality. To address this perception we have hired an outreach coordinator who will be responsible for making potential participants more aware of NCEAS. We have also established a “Who We Are” (www.nceas.ucsb.edu/fmt/doc?nceas-web/aboutnceas) page on our web site that characterizes NCEAS, and have altered our Call for Proposals to encourage first-time applicants and members of underrepresented groups.

-- *Improve communication about successful proposals* – When NCEAS began we posted all successful proposals on our web site. This quickly became so large it was not especially useful to applicants. We considered posting a few example proposals, but recognized that applicants tended to copy the style and format, something we did not want to encourage. The eventual solution has been to post bulleted suggestions for successful proposals from the Science Advisory Board (who review the proposals). In addition, we encourage first-time applicants to talk to us about their ideas and their proposals.

-- *Director, Deputy Director more involved in soliciting proposals* – In an effort to minimize setting the research agenda for the Center, I am strongly opposed to making this a

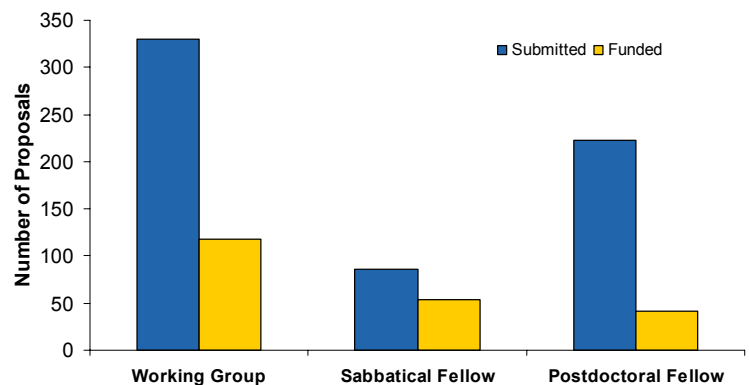


Figure 4. The number of proposals submitted and funded in each of the three primary research approaches. The Working Groups and Postdoctoral positions are especially competitive.

major approach to attracting proposals. Nevertheless, we do encourage submissions for especially interesting topics, from underrepresented areas, and from scientists who might not realize that they are eligible to work at an ecology center.

-- *Greater graduate student involvement* – NCEAS has a very good record of involving graduate students – 37 interns at NCEAS and 27 associated with Working Group leaders at their home institutions. The Center’s Distributed Graduate Seminars have been particularly effective, involving hundreds of students from several countries (we plan to expand these; see below).

-- *Greater involvement of underrepresented individuals* – We now have as an expectation that Working Group proposals include those underrepresented at NCEAS and in science in general. The Science Advisory Board is especially sensitive to this issue, and proposals are evaluated in that light. In addition, we have established a program with the American Institute of Biological Sciences (see below) to develop a broad-ranging program to engage ethnic minorities. When proposals are viewed as otherwise equivalent, the inclusion of underrepresented individuals in projects serves as a tie-breaker.

Extension of Activities – The maturation of NCEAS provides an opportunity to develop new axes of involvement and expand along those that already exist. In addition to adjustments to the core activities mentioned above, we propose the following as part of the renewal:

I. Expand the role of NCEAS in training individuals in the use of emerging ecoinformatics tools.

As noted, NCEAS has been deeply involved in developing tools for generic access to ecological data. The tools are reaching maturity and are being deployed in a number of settings (it is important to note that these efforts are directed toward generic access to information rather than the development of topic or location-specific databases). We believe that the most effective way to train users is to involve them while they are engaged in synthesis and analysis at NCEAS. Thus, rather than having workshops isolated from synthesis, scientists and students are actively involved in accessing data and conducting analyses. We believe this training will improve the technical capabilities of NCEAS visitors and promote future collaborations, synthesis, and analysis throughout the community. To do this we will make our current approach of assisting visiting and resident scientists comprehensive, engaging individual groups before they arrive at NCEAS. While at NCEAS, we will work with them on those data management and analytical requirements that will most directly affect their research activities and tie these to our tools.

II. Increase the Center’s role in influencing the culture of science.

Studies by sociologists indicate that the NCEAS model is an effective means to promote collaboration and synthesis. While we plan to continue those approaches that facilitate cultural change, we also propose several new approaches to affecting the community of scientists.

One involves the serious problem of the representation of ethnic minorities in science, and particularly research. As with most scientific institutions, we are aware of our shortcomings in this area, and every review of NCEAS has reiterated this concern. We have considered various ways to address this issue, but it is difficult both because we are a fairly small enterprise compared to the problem, and we are not experts in addressing these issues. Therefore, we propose to provide at least \$10,000 to the American Institute of Biological Sciences (AIBS) to direct toward developing programs that institutions like NCEAS can employ to effectively address this situation. Of course \$10,000, whether spent by NCEAS or another entity, is not going to yield significant solutions. Thus, we will work with AIBS to get other organizations to

contribute in anticipation that a combined effort, generating programs that can be used by all institutional participants, will be more successful than individual, idiosyncratic, efforts.

NCEAS has had exceptional success with Distributed Graduate Seminars (DGS; more than 700 graduate students have participated). The seminars focus on a topic and take place at a number of universities simultaneously (a total of 15 in this country and others in South Africa, Israel, and Australia). Students enroll at their home institution and use data from a local site or the region to analyze the issue at hand. Working through a coordinator at NCEAS, each group interacts with others through web-based collaborative spaces in regard to questions to be addressed and parameters analyzed. At the end of the seminar, a number of the students from each group come to NCEAS and conduct a grand synthesis at continental or global scales. The seminars provide a number of benefits to students, including pedagogical (in relation to the topic), networking, and imbuing them with the notion of synthesis, collaboration, and use of data tools. We propose to conduct two seminar series a year, one with the topic identified by our Science Advisory Board and another with the topic open to the applicants.

III. Expand the existing NCEAS model to new areas.

The majority of research activities at NCEAS have focused on basic issues in ecology and associated areas, although about one quarter have had an implicit or explicit conservation or resource management component. A few of the 360 projects at NCEAS have focused on topics from the social sciences as they pertain to ecology and it is clear that these areas would benefit from greater application of analysis and synthesis. Thus, we propose activity in the following (note that funding for some of these efforts, while relying on the underlying efficacy of the NCEAS model, would come from sources outside NCEAS core NSF support):

Research in support of conservation and resource management – More than a quarter of the projects supported by NCEAS have had conservation or resource management components. For example, one of the high profile research projects at NCEAS was the Theory of Marine Reserves. The project was very analytical and conceptual, and the results were published in respected journals. The results quickly moved into practice and played a central role in the establishment of actual reserves in the Santa Barbara Channel.

These types of activities will continue at NCEAS, but we propose applying the model to projects of interest to non-governmental organizations, private foundations, etc. In these settings the topic would be specified and there would be a focus on synthesizing and analyzing existing information to leverage information gathered in field research. The advantage to the requesting/funding organization is the independence, credibility, and analytical results generated by NCEAS projects. More importantly, taking advantage of collaboration among many disciplines, something that is absolutely necessary to address most environmental problems, will increase the success of conservation and resource management strategies.

A recent award from the Packard Foundation provides a test of the NCEAS model in situations where the topic is identified beforehand and specific goals are sought. The project focuses on ecosystem-based management of coastal systems and includes Working Groups, Postdoctoral Associates and a Distributed Graduate Seminar. All aspects of the project (staff, rent, equipment, salaries) are being funded by the Foundation. Results suggest that this will be a successful project, so we propose to develop a distinct element of NCEAS that focuses on the application of ecological knowledge. This section will have its own director/coordinator, staff, space, etc. paid for by funding organizations. Ideally, projects from the core research of NCEAS can be leveraged to generate solutions much like the marine reserves example.

Social sciences relevant to ecology – Many ecological issues require the involvement of social scientists. NCEAS has been involved in the social sciences to some degree already, but we propose to expand our activities strategically in the following areas:

- Ecological economics – as the understanding of ecological economics increases, especially with regard to ecosystem services, more integration of information and in depth-analysis will be required. NCEAS has already supported several ecosystem services projects and will seek others.
- Ecology of infectious diseases – this is an expanding area of interest in both NSF and NIH, and NCEAS has conducted a number of research projects on this issue (e.g. global changes and infectious disease). That will continue, but we propose to become engaged with scientists and practitioners in public health and medicine to enhance wise decision-making in this arena.
- Sociology and the culture of ecology – NCEAS has conducted several studies in this area, such as how the use of metaphors influences the study of ecology and evolution, and the nature of publication biases in ecology. Many aspects of how we conduct our science have important impacts and influences on research results (e.g., the sociology of collaboration in science) and we propose to pursue these lines of inquiry more thoroughly.

Promote synthesis and analysis in large programmatic areas – Nationally and internationally ecology involves large programs such as the Long Term Ecological Research program (LTER), the National Ecological Observatory Network (NEON) effort, and the Millennium Assessment. In addition, the Environmental Research and Education program at NSF has identified synthesis needs with regard to programmatic areas. Recently, a new National Evolution Synthesis Center (NESCent) began, and a similar effort is emerging in the hydrology community. NCEAS has participated in all of these to some extent, most directly through collaborative efforts in ecoinformatics. We propose to develop collaborative efforts in those areas where the type of synthesis and analysis conducted at NCEAS can be useful.

The Future of NCEAS

What will NCEAS look like if a renewal is awarded? Its core activities – Working Groups, Center Fellows, and Postdoctoral Associates – will be enhanced, as outlined above. Some activities will be added, such as two Distributed Graduate Seminars a year and additional training in ecoinformatics. Typically, the research activities will include more ecological economics, ecology of disease, and the influence of culture and sociology on ecology. Operationally, we will be providing more computing and analytical assistance to NCEAS scientists, and requiring greater participation by graduate students and underrepresented groups. In addition, the NCEAS model will be applied to explicit conservation and resource management needs using external funds.

How will all of these efforts be supported? We propose that the core elements continue to be supported by NSF, as outlined in this proposal. The new elements will be funded from other extramural sources, including private funds. The Center has already received substantial support outside of the base funding. During its first 11 years, the base funding for Center activities from NSF totaled \$27.5M. In addition the University of California and the UCSB campus provided \$8.5M in matching funds. These funds were leveraged to secure an additional \$9.75M from NSF (primarily for informatics research) and \$9.1M in private funds. Note that the off-campus indirect cost rate is applied to NCEAS funding (26% vs. 47%). Furthermore, by paying salaries from matching funds and rent from NSF funds (see Budget Justification for details), a significantly lower net indirect cost is incurred.

As part of the renewal effort, UC-Santa Barbara has pledged a full-time Development Officer for NCEAS. We have benefited from the services of the development office on campus, but this new position will be directly associated with NCEAS and focus on the Center's distinctive needs and strengths. The Development Officer will seek funds to support both core research and those activities that we propose for expansion. We have also hired an outreach coordinator who has the responsibility of raising the profile of NCEAS at many levels.

It is essential to recognize that the substantial support the Center has received outside the base funding is a result of the perceived success and effectiveness of the NCEAS model. In addition, supporters (especially private foundations) are drawn to the independence and credibility of NCEAS as a research institution engendered by the rigorous evaluation and peer-review conducted by NSF. While foundations are interested in leveraging the capabilities of the Center, they would not replace the type of support NSF provides for basic research. Rather, other extramural supporters are interested in leveraging both the approaches and results of our core activities to address the issues of particular interest to them.

Does ecology still need NCEAS? Perhaps the first question should be does ecology still need analysis and synthesis? While all sciences would benefit from these research approaches, ecology is distinctive. The biosphere is composed of complex, simultaneous, contingent interactions and understanding it requires expertise from many domains. Furthermore, ecologists are increasingly called upon to address societal needs, adding other levels of complexity and axes of inquiry. Even with thousands of scientists conducting research at specific sites, we are getting only a glimpse of natural processes in space and time, filtered through confounding factors such as local conditions and historical influences. While results from individual research projects remain the foundation of our understanding of ecological systems, there are few opportunities to leverage large amounts of site-specific information into regional and global patterns and generalities.

Recognizing this, more than a decade ago NSF ushered in a new culture of synthesis in ecology by initiating a "synthesis and analysis center" and the Foundation has now shown a generation of researchers and students that these are crucial elements of 21st century science. The past success and importance of the Center have been outlined in this proposal, but the question remains, does ecology still need NCEAS?

We believe the answer is emphatically yes. The synthesis, analysis, collaboration, and cutting-edge ecoinformatics have demonstrably advanced ecology and allied disciplines. NCEAS is now viewed by many as valuable, important, and even necessary as part of the process, and progress, of ecology. In addition to the core qualities of intellectual merit and broad community impacts, research at the Center leverages existing scientific results into new insights, spawns persistent collaborations, and imbues the next generation of ecologists with the notion that information sharing is important. As a Center, NCEAS fosters creative research by lowering the activation energy for collaboration, offers a neutral, distant location that promotes productive interactions, and provides a venue for those anticipated but unpredictable, serendipitous encounters that inspire new insights.

NCEAS provides a unique resource for ecology, in all of its manifestations. As such, we believe NCEAS has become part of the intellectual infrastructure of our discipline, effectively supporting one of the most important approaches to our complex field. As noted in the report from the Center's 2002 review, "the value of these syntheses to advancing ecology and allied fields is incalculable." The report further notes that "some of the research performed by the working groups is simply not fundable elsewhere."

Does this maturing model of NCEAS fit the goals of the user community and NSF? Our sense is that it does on all counts. NCEAS participants praise the Center, and the distinctive approach developed by NCEAS is cost-effective (leveraging millions of dollars of existing research results), productive, and yields significant results. The Center also influences the culture of ecology and allied disciplines all along the pipeline, from school children through larval scientists to professional researchers. And finally, the Center facilitates the application of empirical and theoretical research results to important environmental issues. This has been true for the last ten years, and will be more so with the proposed extension of NCEAS.

Evidence confirms that synthesis and analysis are essential approaches in ecology; consequently we suggest that an institutional commitment to the notion of a synthesis center is fitting. We propose, therefore, that NCEAS be supported for at least an additional five years.

Significance

NCEAS has facilitated and catalyzed many successful research activities, and the researchers at the Center have produced many significant results. While some institutions that have been active as long as NCEAS are bound to generate a few high profile successes, NCEAS has had a transformative effect on ecology. Statistics about NCEAS are spread throughout this proposal, but a few succinct points reveal the essential nature of the Center's impact. The ranking of NCEAS at 22nd in the world in citations per article in ecology and the environment (out of almost 38,000 institutions) reveals that research by scientists at NCEAS is important and of great interest. In relation to the ecoinformatics research conducted at NCEAS, the Center has been a leader in making data (not just databases) openly available to the user community. And finally, NCEAS has been proven to be distinctively effective at promoting collaboration among individuals and disciplines.

While these accomplishments are due, in part, to the model of a synthesis center that emerged from several workshops and the wisdom of NSF more than a decade ago, they are also the result of its specific manifestation at NCEAS. The fundamental philosophy of NCEAS is that the Center prospers by providing beneficial opportunities to motivated scholars. Thus, rather than imagining what might be best for NCEAS, we provide what is effective for participants, and share in the successes of their hard work.

Beyond the importance of the research conducted at the Center, a longer lasting legacy will emerge from the nature of the research process at NCEAS. The essence of this approach is to bring together individuals who have much to learn from each other and to facilitate their opportunities to interact intellectually. It is virtually impossible to convey what may be the true essence of NCEAS – that intense spark of creativity and scholarship that can emerge when individuals from disparate disciplines focus on important questions. While most scientists probably imagined these elements would be part of the intellectual life they were joining, it is increasingly difficult to find time to focus under circumstances filled with the many institutional and administrative obligations that impinge on scholarship. Thus, perhaps as never before, scientists need a place like NCEAS that is dedicated to these intellectual ideals.

NCEAS is a unique institution with an explicit mission to foster synthesis and analysis, turn information into knowledge, and alter how we do science through effective collaboration. This mission will endure as long as ecologists seek answers to complex questions and work to understand the biosphere. We believe the record of achievement, breadth of activities, impact of its results, and unique opportunities for future leadership warrant support of the National Center for Ecological Analysis and Synthesis for five additional years.

O. J. Reichman
CURRICULUM VITAE

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(805) 892-2504, reichman@nceas.ucsb.edu

EDUCATION:

| | | | |
|-----------------------------|------------------------------|-------|------|
| Texas Tech University | Zoology major, History minor | B.A. | 1968 |
| Texas Tech University | Biology | M.S. | 1970 |
| Northern Arizona University | Biology | Ph.D. | 1974 |
| University of Utah | Post-doc. (with J. H. Brown) | | 1975 |

RECENT PROFESSIONAL EMPLOYMENT:

1996- Director, National Center for Ecological Analysis and Synthesis
1996- Professor, University of California, Santa Barbara
1995-96 Assistant Director - Research, National Biological Service, Dept. of Interior
1993-95 Director, Konza Prairie Research Natural Area
1992 Professor, Kansas State University
1991-93 Associate Vice Provost for Research, Director of the Office of Research and Sponsored Programs (Interim), Kansas State University
1990-91 Director, Ecology Program, National Science Foundation

OTHER RECENT PROFESSIONAL ACTIVITIES:

1998-00 President, American Society of Mammalogists
1998 -01 Editor, Ecological Applications
1997 -01 Advisory Board, *Ecosystems*
1997 - Board of Trustees, Zoological Record (BIOSIS/UK)
1988 - Board of Directors, American Society of Mammalogists
1993-97 Editor, Special Features, *Journal of Mammalogy*
1992-97 Board of Trustees, BIOSIS Corporation (Vice Chair; Chair)
1993-95 Council (Board of Directors), Ecological Society of America
1992-95 Board of Editors, Ecological Society of America (Ecology)

FIVE PUBLICATIONS PERTINENT TO THIS PROJECT:

Palmer, M. (and many authors). 2005. Ecological science and sustainability for the 21st century. *Frontiers in Ecology and the Environment* 3:4-11
Palmer, M. (and many authors). 2004. Ecology for a crowded planet. *Science* 304:1251-1252
Seabloom, E. W., S. Harpole, O. J. Reichman, and D. Tilman. 2003. Invasion, competitive dominance, and resource use by exotic and native California grassland species. *Proceeding of the National Academy of Sciences*. 100:13384-13389
Gabet, E. J., O. J. Reichman, and E. W. Seabloom. 2003. The effects of bioturbation on soil processes and sediment transport. *Ann. Rev. Earth and Planetary Sci.* 31:249-273.

Reichman, O. J. and E. W. Seabloom. 2002. The role of pocket gophers as subterranean ecosystem engineers. *Trends Ecol. and Evol.* 17:44-49.

FIVE RECENT PUBLICATIONS:

Romañach, S., O. J. Reichman., and E. W. Seabloom. 2005. Seasonal influences on burrowing activity of a subterranean rodent, *Thomomys bottae*. *J. Zoology* (in press).

Romañach, S., E. W. Seabloom, O. J. Reichman, W. Rogers, and G. Cameron. 2005. Effects of species, gender, age, and habitat on pocket gopher foraging tunnel geometry. *J. Mammalogy* (in press).

Seabloom, E. W., O. Bjornstad, B. Bolker, and O. J. Reichman. 2005. The spatial signature of environmental heterogeneity, dispersal, and competition in successional grasslands. *Ecological Monographs* 75:199-214

Gerber, L. R., O. J. Reichman, and J. Roughgarden. 2004. Food hoarding: future value in foraging decisions. *Ecological Modeling.* 175:77-85

Gerber, L. R., E.W Seabloom, R.S. Burton, O.J. Reichman 2003. Translocation of an imperiled wood rat population: integrating spatial and habitat patterns. *Animal Conservation* 6:309-316

SYNERGESTIC ACTIVITIES:

Director of the National Center for Ecological Analysis and Synthesis – management of scores of projects involving hundreds of scientists/year directed toward synthesis activities. Substantial involvement by students, women, and minorities

PI – Ecological Informatics Research Activities – oversight of large projects designed to integrate data access with synthesis activities

COLLABORATORS: (No co-editing collaborators) - Andelman, Sandy (NCEAS); Bernhart, E. (Duke); Bjornstad, Ottar (Penn. State U.); Bolker, Brian (U. Florida); Brunt, James (U. New Mexico); Cameron, G. (U. Cinn.); Couch, Carol (USGS); Chornesky, E. (UC Santa Cruz); Collins, S. (U. New Mexico); Dobson, A. (Princeton); Duke, C. (ESA); Gabet, Emanuel (UC Santa Barbara); Gold, B. (Packard Found.); Gough, Laura (Alabama-Tuscaloosa); Harpole, Stan (U. Minn.); Holt, Robert (Univ. Florida); Hooper, David (Western Washington U.); Jacobson, R. (USGS); Keesing, Felicia (Bard College); Kingsland, S. (Johns Hopkins); Kranz, R. (ESA); Lovell, C. R. (U. South Carolina); Mappin, M. (U. Calgary); Martinez, M. (Instituto de Ecologia); Michelli, F. (Stanford); Michener, William (U. New Mexico); Milne, Bruce (U. New Mexico); Molles, Manuel (U. New Mexico); Morin, Peter (Rutgers); Mores, J. (U. Md.); Pace, M. (Inst. Ecos. Studies); Palmer, Margaret (U. Md.); Pascual, M. (U. Mich.); Paslumbi, S. (Stanford); Porter, Warren (U. Wisconsin); Power, Mary (UC Berkeley); Ramankutty, Navin (U. Wisconsin); Roberts, David (Utah State U.); Rogers, W. (Texas A&M); Roughgarden, J. (Stanford); Sabo, John (Arizona State U.); Simons, A. (SeaWeb); Sterner, Robert (U. Wisconsin); Strauss, Sharon (UC Davis); Thompson, John (UC Santa Cruz); Tilman, David (U. Minn.); Townsend, A. (U. Colo.); Tracey, C. R. (U. Wisconsin); Turner, M. (U. Wisc.); D. Wall (Colorado State U.); Willig, Michael (NSF).

ADVISORS: R. Baker (MA; Texas Tech U.), J. Brown (Post-doctoral; U. New Mexico), T. Vaughan (Ph.D.; Retired)

GRADUATE STUDENTS (13 total): R. Burton (Alverno College), C. Frank (Fordham), J. Herrera (Truman State U.), E. Horne (KSU), M. McDonald (Bethany College), G. Melaik (Brookfield Zoo), E. Muths (USGS), D. Post (U. Texas, Midland), C. Rebar (Edinboro Univ.), S. Romanach (UCSB), C. Schwemm (UCSB), S. Watts (UCSB), D. Wooster (U. Md.);

POSTDOCTORAL ASSOCIATES (5 total): R. Burton (Alverno College), R. Gendron (Indiana U. PA), L. Gerber (Ariz. State. U.), J. Orrock (NCEAS), E. Seabloom (Oregon State U.)

SUMMARY PROPOSAL BUDGET YEAR 1

| ORGANIZATION University of California-Santa Barbara | | | | FOR NSF USE ONLY | | | |
|---|--|--------------|--|---------------------------------|-------------------|-----------------------------|-------------------------------------|
| | | | | PROPOSAL NO. | DURATION (months) | | |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR Omer J Reichman | | | | AWARD NO. | Proposed | Granted | |
| | | | | | | | |
| A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | | | | NSF Funded Person-months | | Funds Requested By proposer | Funds granted by NSF (if different) |
| | | | | CAL | ACAD | SUMR | |
| 1. Omer J Reichman - PI-Director | | | | 0.00 | 0.00 | 2.00 | \$ 29,261 |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | | | | 0.00 | 0.00 | 0.00 | 0 |
| 7. (1) TOTAL SENIOR PERSONNEL (1 - 6) | | | | 0.00 | 0.00 | 2.00 | 29,261 |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | | | |
| 1. (12) POST DOCTORAL ASSOCIATES | | | | 144.00 | 0.00 | 0.00 | 527,040 |
| 2. (5) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | | | | 51.00 | 0.00 | 0.00 | 292,746 |
| 3. (0) GRADUATE STUDENTS | | | | | | | 0 |
| 4. (2) UNDERGRADUATE STUDENTS | | | | | | | 5,000 |
| 5. (2) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | | | | 106,020 |
| 6. (0) OTHER | | | | | | | 0 |
| TOTAL SALARIES AND WAGES (A + B) | | | | | | | 960,067 |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | | | | 175,522 |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | | | | 1,135,589 |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.) | | | | | | | |
| Computing Equipment | | | | \$ | 64,365 | | |
| TOTAL EQUIPMENT | | | | | | | 64,365 |
| E. TRAVEL 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | | | | 62,500 |
| 2. FOREIGN | | | | | | | 7,500 |
| F. PARTICIPANT SUPPORT COSTS | | | | | | | |
| 1. STIPENDS \$ <u>285,600</u> | | | | | | | |
| 2. TRAVEL <u>231,710</u> | | | | | | | |
| 3. SUBSISTENCE <u>573,690</u> | | | | | | | |
| 4. OTHER <u>0</u> | | | | | | | |
| TOTAL NUMBER OF PARTICIPANTS (725) | | | | | | | |
| TOTAL PARTICIPANT COSTS | | | | | | | 1,091,000 |
| G. OTHER DIRECT COSTS | | | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | | | | 106,000 |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | | | | 5,000 |
| 3. CONSULTANT SERVICES | | | | | | | 0 |
| 4. COMPUTER SERVICES | | | | | | | 0 |
| 5. SUBAWARDS | | | | | | | 0 |
| 6. OTHER | | | | | | | 630,784 |
| TOTAL OTHER DIRECT COSTS | | | | | | | 741,784 |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | | | | 3,102,738 |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) | | | | | | | |
| MTDC (Rate: 26.0000, Base: 1384073) | | | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | | | | 359,859 |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | | | | 3,462,597 |
| K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.) | | | | | | | 0 |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | | | | \$ 3,462,597 |
| M. COST SHARING PROPOSED LEVEL \$ 0 | | | | AGREED LEVEL IF DIFFERENT \$ | | | |
| PI/PD NAME Omer J Reichman | | | | FOR NSF USE ONLY | | | |
| ORG. REP. NAME* Jill boltz | | | | INDIRECT COST RATE VERIFICATION | | | |
| | | Date Checked | | Date Of Rate Sheet | | Initials - ORG | |

SUMMARY PROPOSAL BUDGET YEAR 2

| ORGANIZATION University of California-Santa Barbara | | | | FOR NSF USE ONLY | | | |
|--|--|--------------|--------------------|---|-------------------|---------|--------------|
| | | | | PROPOSAL NO. | DURATION (months) | | |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR Omer J Reichman | | | | AWARD NO. | Proposed | Granted | |
| | | | | A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | | | |
| | | | | CAL | ACAD | SUMR | |
| 1. Omer J Reichman - PI-Director | | | | 0.00 | 0.00 | 2.00 | \$ 29,760 |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | | | | 0.00 | 0.00 | 0.00 | 0 |
| 7. (1) TOTAL SENIOR PERSONNEL (1 - 6) | | | | 0.00 | 0.00 | 2.00 | 29,760 |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | | | |
| 1. (12) POST DOCTORAL ASSOCIATES | | | | 144.00 | 0.00 | 0.00 | 537,528 |
| 2. (6) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | | | | 63.50 | 0.00 | 0.00 | 388,422 |
| 3. (0) GRADUATE STUDENTS | | | | | | | 0 |
| 4. (2) UNDERGRADUATE STUDENTS | | | | | | | 5,000 |
| 5. (1) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | | | | 41,516 |
| 6. (0) OTHER | | | | | | | 0 |
| TOTAL SALARIES AND WAGES (A + B) | | | | | | | 1,002,226 |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | | | | 182,063 |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | | | | 1,184,289 |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.) | | | | | | | |
| Computing Equipment | | | | \$ | 35,245 | | |
| TOTAL EQUIPMENT | | | | | | | 35,245 |
| E. TRAVEL | | | | | | | 62,500 |
| 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | | | | |
| 2. FOREIGN | | | | | | | 0 |
| F. PARTICIPANT SUPPORT COSTS | | | | | | | |
| 1. STIPENDS \$ _____ | | | | 280,312 | | | |
| 2. TRAVEL _____ | | | | 240,462 | | | |
| 3. SUBSISTENCE _____ | | | | 595,426 | | | |
| 4. OTHER _____ | | | | 0 | | | |
| TOTAL NUMBER OF PARTICIPANTS (725) | | | | | | | 1,116,200 |
| TOTAL PARTICIPANT COSTS | | | | | | | |
| G. OTHER DIRECT COSTS | | | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | | | | 108,086 |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | | | | 5,000 |
| 3. CONSULTANT SERVICES | | | | | | | 0 |
| 4. COMPUTER SERVICES | | | | | | | 0 |
| 5. SUBAWARDS | | | | | | | 0 |
| 6. OTHER | | | | | | | 585,749 |
| TOTAL OTHER DIRECT COSTS | | | | | | | 698,835 |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | | | | 3,097,069 |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) | | | | | | | |
| MTDC (Rate: 26.0000, Base: 1405875) | | | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | | | | 365,528 |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | | | | 3,462,597 |
| K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.) | | | | | | | 0 |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | | | | \$ 3,462,597 |
| M. COST SHARING PROPOSED LEVEL \$ 0 | | | | AGREED LEVEL IF DIFFERENT \$ | | | |
| PI/PD NAME Omer J Reichman | | | | FOR NSF USE ONLY | | | |
| ORG. REP. NAME* Jill boltz | | | | INDIRECT COST RATE VERIFICATION | | | |
| | | Date Checked | Date Of Rate Sheet | Initials - ORG | | | |

SUMMARY PROPOSAL BUDGET YEAR 3

| ORGANIZATION University of California-Santa Barbara | | | | FOR NSF USE ONLY | | | |
|---|------------|--------------|--------------------|---------------------------------|-------------------|-----------------------------|-------------------------------------|
| | | | | PROPOSAL NO. | DURATION (months) | | |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR Omer J Reichman | | | | AWARD NO. | Proposed | Granted | |
| A. SENIOR PERSONNEL: PI/PI, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | | | | NSF Funded Person-months | | Funds Requested By proposer | Funds granted by NSF (if different) |
| | CAL | ACAD | SUMR | | | | |
| 1. Omer J Reichman - PI-Director | 0.00 | 0.00 | 2.00 | \$ 30,270 | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | 0.00 | 0.00 | 0.00 | 0 | | | |
| 7. (1) TOTAL SENIOR PERSONNEL (1 - 6) | 0.00 | 0.00 | 2.00 | 30,270 | | | |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | | | |
| 1. (12) POST DOCTORAL ASSOCIATES | 144.00 | 0.00 | 0.00 | 548,280 | | | |
| 2. (6) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | 63.50 | 0.00 | 0.00 | 399,177 | | | |
| 3. (0) GRADUATE STUDENTS | | | | 0 | | | |
| 4. (2) UNDERGRADUATE STUDENTS | | | | 5,000 | | | |
| 5. (1) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | 42,342 | | | |
| 6. (0) OTHER | | | | 0 | | | |
| TOTAL SALARIES AND WAGES (A + B) | | | | 1,025,069 | | | |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | 186,256 | | | |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | 1,211,325 | | | |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.) | | | | | | | |
| Computing Equipment | | | | \$ 76,951 | | | |
| TOTAL EQUIPMENT | | | | 76,951 | | | |
| E. TRAVEL | | | | | | | |
| 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | 62,500 | | | |
| 2. FOREIGN | | | | 7,500 | | | |
| F. PARTICIPANT SUPPORT COSTS | | | | | | | |
| 1. STIPENDS | \$ 305,118 | | | | | | |
| 2. TRAVEL | 249,579 | | | | | | |
| 3. SUBSISTENCE | 617,947 | | | | | | |
| 4. OTHER | 0 | | | | | | |
| TOTAL NUMBER OF PARTICIPANTS (725) | | | | TOTAL PARTICIPANT COSTS | 1,172,644 | | |
| G. OTHER DIRECT COSTS | | | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | 110,628 | | | |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | 5,000 | | | |
| 3. CONSULTANT SERVICES | | | | 0 | | | |
| 4. COMPUTER SERVICES | | | | 0 | | | |
| 5. SUBAWARDS | | | | 0 | | | |
| 6. OTHER | | | | 613,751 | | | |
| TOTAL OTHER DIRECT COSTS | | | | 729,379 | | | |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | 3,260,299 | | | |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) | | | | | | | |
| MTDC (Rate: 26.0000, Base: 1443953) | | | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | 375,428 | | | |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | 3,635,727 | | | |
| K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.) | | | | 0 | | | |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | \$ 3,635,727 | | | |
| M. COST SHARING PROPOSED LEVEL \$ 0 | | | | AGREED LEVEL IF DIFFERENT \$ | | | |
| PI/PI NAME Omer J Reichman | | | | FOR NSF USE ONLY | | | |
| ORG. REP. NAME* Jill boltz | | | | INDIRECT COST RATE VERIFICATION | | | |
| | | Date Checked | Date Of Rate Sheet | Initials - ORG | | | |

SUMMARY PROPOSAL BUDGET YEAR 4

| ORGANIZATION University of California-Santa Barbara | | | | FOR NSF USE ONLY | | | |
|---|--|--|--|---------------------------------|--------------------|-----------------------------|-------------------------------------|
| | | | | PROPOSAL NO. | DURATION (months) | | |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR Omer J Reichman | | | | AWARD NO. | Proposed | Granted | |
| | | | | | | | |
| A. SENIOR PERSONNEL: PI/PI, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | | | | NSF Funded Person-months | | Funds Requested By proposer | Funds granted by NSF (if different) |
| | | | | CAL | ACAD | SUMR | |
| 1. Omer J Reichman - PI-Director | | | | 0.00 | 0.00 | 2.00 | \$ 32,975 |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | | | | 0.00 | 0.00 | 0.00 | 0 |
| 7. (1) TOTAL SENIOR PERSONNEL (1 - 6) | | | | 0.00 | 0.00 | 2.00 | 32,975 |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | | | |
| 1. (12) POST DOCTORAL ASSOCIATES | | | | 144.00 | 0.00 | 0.00 | 559,200 |
| 2. (6) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | | | | 63.50 | 0.00 | 0.00 | 426,859 |
| 3. (0) GRADUATE STUDENTS | | | | | | | 0 |
| 4. (2) UNDERGRADUATE STUDENTS | | | | | | | 5,000 |
| 5. (1) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | | | | 43,190 |
| 6. (0) OTHER | | | | | | | 0 |
| TOTAL SALARIES AND WAGES (A + B) | | | | | | | 1,067,224 |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | | | | 194,177 |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | | | | 1,261,401 |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.) Computing Equipment | | | | \$ | 36,918 | | |
| TOTAL EQUIPMENT | | | | | | | 36,918 |
| E. TRAVEL | | | | | | | 62,500 |
| 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | | | | 62,500 |
| 2. FOREIGN | | | | | | | 7,500 |
| F. PARTICIPANT SUPPORT COSTS | | | | | | | |
| 1. STIPENDS \$ _____ | | | | 300,020 | | | |
| 2. TRAVEL _____ | | | | 259,076 | | | |
| 3. SUBSISTENCE _____ | | | | 641,283 | | | |
| 4. OTHER _____ | | | | 0 | | | |
| TOTAL NUMBER OF PARTICIPANTS (725) | | | | | | | 1,200,379 |
| TOTAL PARTICIPANT COSTS | | | | | | | 1,200,379 |
| G. OTHER DIRECT COSTS | | | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | | | | 113,201 |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | | | | 5,000 |
| 3. CONSULTANT SERVICES | | | | | | | 0 |
| 4. COMPUTER SERVICES | | | | | | | 0 |
| 5. SUBAWARDS | | | | | | | 0 |
| 6. OTHER | | | | | | | 730,025 |
| TOTAL OTHER DIRECT COSTS | | | | | | | 848,226 |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | | | | 3,416,924 |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) MTDC (Rate: 26.0000, Base: 1540727) | | | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | | | | 400,589 |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | | | | 3,817,513 |
| K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.) | | | | | | | 0 |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | | | | \$ 3,817,513 \$ |
| M. COST SHARING PROPOSED LEVEL \$ 0 | | | | AGREED LEVEL IF DIFFERENT \$ | | | |
| PI/PI NAME Omer J Reichman | | | | FOR NSF USE ONLY | | | |
| ORG. REP. NAME* Jill boltz | | | | INDIRECT COST RATE VERIFICATION | | | |
| | | | | Date Checked | Date Of Rate Sheet | Initials - ORG | |

SUMMARY PROPOSAL BUDGET YEAR 5

| ORGANIZATION University of California-Santa Barbara | | | | FOR NSF USE ONLY | | | |
|--|--|--------------|--------------------|---|------------------------------|---------|--------------|
| | | | | PROPOSAL NO. | DURATION (months) | | |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR Omer J Reichman | | | | AWARD NO. | Proposed | Granted | |
| | | | | A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | | | |
| | | | | CAL | ACAD | SUMR | |
| 1. Omer J Reichman - PI-Director | | | | 0.00 | 0.00 | 2.00 | \$ 33,549 |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. (0) OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | | | | 0.00 | 0.00 | 0.00 | 0 |
| 7. (1) TOTAL SENIOR PERSONNEL (1 - 6) | | | | 0.00 | 0.00 | 2.00 | 33,549 |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | | | |
| 1. (12) POST DOCTORAL ASSOCIATES | | | | 60.00 | 0.00 | 0.00 | 570,384 |
| 2. (7) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | | | | 64.50 | 0.00 | 0.00 | 471,484 |
| 3. (0) GRADUATE STUDENTS | | | | | | | 0 |
| 4. (2) UNDERGRADUATE STUDENTS | | | | | | | 5,000 |
| 5. (1) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | | | | 44,052 |
| 6. (0) OTHER | | | | | | | 0 |
| TOTAL SALARIES AND WAGES (A + B) | | | | | | | 1,124,469 |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | | | | 205,535 |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | | | | 1,330,004 |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.) | | | | | | | |
| Computing Equipment | | | | \$ | 42,000 | | |
| TOTAL EQUIPMENT | | | | | | | 42,000 |
| E. TRAVEL | | | | | | | |
| 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | | | | 62,500 |
| 2. FOREIGN | | | | | | | 7,500 |
| F. PARTICIPANT SUPPORT COSTS | | | | | | | |
| 1. STIPENDS \$ _____ | | | | 350,620 | | | |
| 2. TRAVEL _____ | | | | 268,970 | | | |
| 3. SUBSISTENCE _____ | | | | 679,864 | | | |
| 4. OTHER _____ | | | | 0 | | | |
| TOTAL NUMBER OF PARTICIPANTS (725) | | | | | | | |
| TOTAL PARTICIPANT COSTS | | | | | | | 1,299,454 |
| G. OTHER DIRECT COSTS | | | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | | | | 115,805 |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | | | | 5,000 |
| 3. CONSULTANT SERVICES | | | | | | | 0 |
| 4. COMPUTER SERVICES | | | | | | | 0 |
| 5. SUBAWARDS | | | | | | | 0 |
| 6. OTHER | | | | | | | 728,062 |
| TOTAL OTHER DIRECT COSTS | | | | | | | 848,867 |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | | | | 3,590,325 |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) | | | | | | | |
| MTDC (Rate: 26.0000, Base: 1607932) | | | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | | | | 418,062 |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | | | | 4,008,387 |
| K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.) | | | | | | | 0 |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | | | | \$ 4,008,387 |
| M. COST SHARING PROPOSED LEVEL \$ | | | | 0 | AGREED LEVEL IF DIFFERENT \$ | | |
| PI/PD NAME Omer J Reichman | | | | FOR NSF USE ONLY | | | |
| ORG. REP. NAME* Jill boltz | | | | INDIRECT COST RATE VERIFICATION | | | |
| | | Date Checked | Date Of Rate Sheet | Initials - ORG | | | |

SUMMARY PROPOSAL BUDGET Cumulative

| ORGANIZATION University of California-Santa Barbara | | | | FOR NSF USE ONLY | | | |
|--|--|--------------|--|---|-------------------|----------------|---------------|
| | | | | PROPOSAL NO. | DURATION (months) | | |
| PRINCIPAL INVESTIGATOR / PROJECT DIRECTOR Omer J Reichman | | | | AWARD NO. | Proposed | Granted | |
| | | | | A. SENIOR PERSONNEL: PI/PD, Co-PI's, Faculty and Other Senior Associates (List each separately with title, A.7. show number in brackets) | | | |
| | | | | CAL | ACAD | SUMR | |
| 1. Omer J Reichman - PI-Director | | | | 0.00 | 0.00 | 10.00 | \$ 155,815 |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. () OTHERS (LIST INDIVIDUALLY ON BUDGET JUSTIFICATION PAGE) | | | | 0.00 | 0.00 | 0.00 | 0 |
| 7. (1) TOTAL SENIOR PERSONNEL (1 - 6) | | | | 0.00 | 0.00 | 10.00 | 155,815 |
| B. OTHER PERSONNEL (SHOW NUMBERS IN BRACKETS) | | | | | | | |
| 1. (60) POST DOCTORAL ASSOCIATES | | | | 636.00 | 0.00 | 0.00 | 2,742,432 |
| 2. (30) OTHER PROFESSIONALS (TECHNICIAN, PROGRAMMER, ETC.) | | | | 306.00 | 0.00 | 0.00 | 1,978,688 |
| 3. (0) GRADUATE STUDENTS | | | | | | | 0 |
| 4. (10) UNDERGRADUATE STUDENTS | | | | | | | 25,000 |
| 5. (6) SECRETARIAL - CLERICAL (IF CHARGED DIRECTLY) | | | | | | | 277,120 |
| 6. (0) OTHER | | | | | | | 0 |
| TOTAL SALARIES AND WAGES (A + B) | | | | | | | 5,179,055 |
| C. FRINGE BENEFITS (IF CHARGED AS DIRECT COSTS) | | | | | | | 943,553 |
| TOTAL SALARIES, WAGES AND FRINGE BENEFITS (A + B + C) | | | | | | | 6,122,608 |
| D. EQUIPMENT (LIST ITEM AND DOLLAR AMOUNT FOR EACH ITEM EXCEEDING \$5,000.) | | | | | | | |
| | | | | \$ | 255,479 | | |
| TOTAL EQUIPMENT | | | | | | | 255,479 |
| E. TRAVEL | | | | | | | 312,500 |
| 1. DOMESTIC (INCL. CANADA, MEXICO AND U.S. POSSESSIONS) | | | | | | | |
| 2. FOREIGN | | | | | | | 30,000 |
| F. PARTICIPANT SUPPORT COSTS | | | | | | | |
| 1. STIPENDS \$ _____ | | | | 1,521,670 | | | |
| 2. TRAVEL _____ | | | | 1,249,797 | | | |
| 3. SUBSISTENCE _____ | | | | 3,108,210 | | | |
| 4. OTHER _____ | | | | 0 | | | |
| TOTAL NUMBER OF PARTICIPANTS 8,625 | | | | | | | 5,879,677 |
| TOTAL PARTICIPANT COSTS | | | | | | | |
| G. OTHER DIRECT COSTS | | | | | | | |
| 1. MATERIALS AND SUPPLIES | | | | | | | 553,720 |
| 2. PUBLICATION COSTS/DOCUMENTATION/DISSEMINATION | | | | | | | 25,000 |
| 3. CONSULTANT SERVICES | | | | | | | 0 |
| 4. COMPUTER SERVICES | | | | | | | 0 |
| 5. SUBAWARDS | | | | | | | 0 |
| 6. OTHER | | | | | | | 3,288,371 |
| TOTAL OTHER DIRECT COSTS | | | | | | | 3,867,091 |
| H. TOTAL DIRECT COSTS (A THROUGH G) | | | | | | | 16,467,355 |
| I. INDIRECT COSTS (F&A)(SPECIFY RATE AND BASE) | | | | | | | |
| TOTAL INDIRECT COSTS (F&A) | | | | | | | 1,919,466 |
| J. TOTAL DIRECT AND INDIRECT COSTS (H + I) | | | | | | | 18,386,821 |
| K. RESIDUAL FUNDS (IF FOR FURTHER SUPPORT OF CURRENT PROJECTS SEE GPG II.C.6.j.) | | | | | | | 0 |
| L. AMOUNT OF THIS REQUEST (J) OR (J MINUS K) | | | | | | | \$ 18,386,821 |
| M. COST SHARING PROPOSED LEVEL \$ 0 | | | | AGREED LEVEL IF DIFFERENT \$ | | | |
| PI/PD NAME Omer J Reichman | | | | FOR NSF USE ONLY | | | |
| ORG. REP. NAME* Jill boltz | | | | INDIRECT COST RATE VERIFICATION | | | |
| | | Date Checked | | Date Of Rate Sheet | | Initials - ORG | |

C *ELECTRONIC SIGNATURES REQUIRED FOR REVISED BUDGET

Budget Justification

At the request of NSF, the budgets for the first two years of this renewal proposal are the same as the last year of the current award. Increases of 5% are requested in the remaining three years of the renewal proposal budget.

Salaries – The Center has 13.5 FTE administrative and computer staff, including the Director and Deputy Director. Salaries for approximately 50% of the FTE salaries will be paid from matching funds from the University of California and 83% of the Director's salary (9 months plus one summer month) will be paid with UCSB matching funds. The Director is a member of the UCSB faculty and has been 100% release time to the Center. We request 2 months salary for the Director from NSF and 12 months salary for the Deputy. The Deputy coordinates science activities at the Center and works with the Director on planning for the Center.

The Director of Computing oversees the computing staff, software and hardware purchase and maintenance, and the strategic development of the Center's computing capacity and we request full support for this position from NSF. At the request of NSF, we also seek support for two scientific programmers whose responsibility is to assist visiting and resident scientists (note that one of these will be supported by private funds for at least the first year of the renewal). We also request partial support for Matt Jones, our Database and Information Specialist, who will be supported on other extramural funds through 2007. He makes substantial contributions to the Center's ecoinformatics research and deployment and we believe the budget should reflect that.

The salaries for 12 of the Postdoctoral Associates are included in the budget; 3-6 additional Associates are supported in other funds.

Note that in this renewal we have moved many of the salaries to the state matching funds, where they are not subject to indirect costs and where the state pays the associated fringe benefits. Rent for the building housing NCEAS has been moved from the state match to the NSF budget, where it is not subject to indirect costs. The net effect is a substantial savings that can be applied to the research and education activities of NCEAS.

The logistics of conducting NCEAS research activities has climbed substantially because of additional funds NCEAS has received for other projects and because certain operations (particularly travel and visa administration) have become much more time-consuming. Accordingly, we are proposing the addition of one full-time administrative assistant. We have also hired an outreach coordinator and have budgeted to continue that position through the first year of the renewal.

Fringe – Fringe benefits are calculated at approved university rates.

Equipment – the budget request reflects current and anticipated expenditures, and a change in how the university determines what qualifies as equipment (i.e., items up to \$5000 are considered supplies, so many of our computers are supplies and carry indirect costs). We have budgeted for periodic updates in our computing capabilities.

Travel and Participant Costs – The Center pays round-trip air fare, lodging, and per diem expenses for visiting scientists. The Center receives reduced rates at local hotels. The costs of travel and lodging have increased, and the budget reflects these increases.

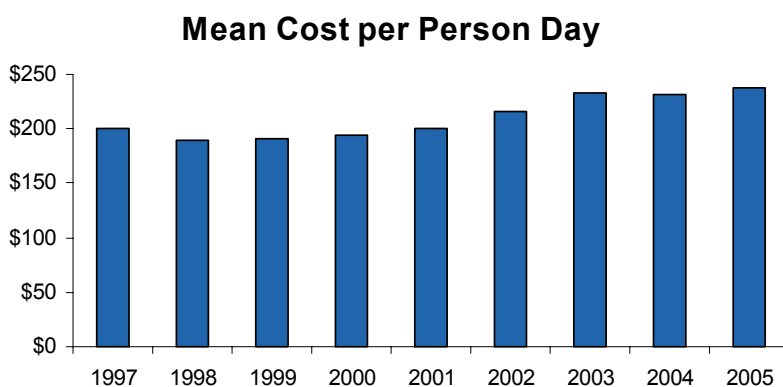


Figure A. The mean cost per person day, including travel, lodging, and per diem. Note the increase since the last award (2000).

The Center supports up to 6 sabbatical visitors each year, providing them with up to one half salary for each month they are in residence and up to \$1,750/month housing allowance. The budget includes support for 2 meetings of the Science Advisory Board per year. Travel funds requested will support travel for resident scientists, postdoctoral associates, and for staff members representing the Center at national and international meetings.

A new element in NCEAS activities are Distributed Graduate Seminars. We request funding for 2 of these per year, including stipends for the seminar leaders, and participant costs to bring graduate students to the Center.

Supplies and Expenses – the amount requested reflects our current and expected expenditures for office and computer supplies.

Publication Costs – Funds are requested to cover reprint costs for publications sponsored by the Center (\$5000/year).

Other Direct Costs – The Center is located off-campus (and thus is subject to the off-campus indirect cost rate) and pays rent for the building where it is located. The rent is subject to a COLA increase annually. We also request \$90,000 for graduate student stipends. Additional stipends will be paid from UCSB matching funds. In addition, funds are requested for communications, including phone, fax, T-3 line and postal expenses. Funds are requested for light refreshments for working groups.

Indirect Costs – Calculated at the off-campus rate of 26% of Modified Total Direct Costs.

Matching Funds - UCSB's contribution is \$3,076,307, and is made up of \$500,000 in cash, which will be used to support a Postdoctoral Associate, administrative staff, and graduate student stipends and fees; \$975,962 in support of the Director's salary and benefits; \$486,580 in benefits paid by the university; and \$1,113,765 in foregone indirect costs. In addition, we will receive \$2.35 million from the State of California.

Current and Pending Support

(See GPG Section II.C.2.h for guidance on information to include on this form.)

| | |
|--|---|
| The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal. | |
| Investigator: Omer Reichman | Other agencies (including NSF) to which this proposal has been/will be submitted. |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: National Center for Ecological Analysis and Synthesis | |
| Source of Support: NSF DEB 0072909 Total Award Amount: \$ 16,653,400 Total Award Period Covered: 08/01/00 - 07/31/06 Location of Project: NCEAS, UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 9.00 Sumr: 2.00 | |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: Production Implementation of the Knowledge Network for Biocomplexity | |
| Source of Support: The Andrew W. Mellon Foundation Total Award Amount: \$ 700,000 Total Award Period Covered: 01/01/03 - 12/31/05 Location of Project: NCEAS, UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.09 Sumr: 0.00 | |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: Request for Support of Planning Activities to Develop Scientific Knowledge in Support of Ecosystem-based Management in Coastal Marine Systems | |
| Source of Support: The David and Lucile Packard Foundation Total Award Amount: \$ 200,647 Total Award Period Covered: 04/01/04 - 03/31/06 Location of Project: NCEAS, UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.09 Sumr: 0.00 | |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: An Information Infrastructure for Vegetation Science | |
| Source of Support: University of North Carolina Total Award Amount: \$ 323,734 Total Award Period Covered: 09/01/02 - 08/31/06 Location of Project: NCEAS, UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.09 Sumr: 0.00 | |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: ITR Collaborative Research: Enabling the Science Environment for Ecological Knowledge (Reichman/Schildhauer/Jones) | |
| Source of Support: NSF EF-0225676 Total Award Amount: \$ 2,910,756 Total Award Period Covered: 10/01/02 - 09/30/06 Location of Project: NCEAS, UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.09 Summ: 0.00 | |

*If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period.

Current and Pending Support

(See GPG Section II.C.2.h for guidance on information to include on this form.)

| | |
|--|---|
| The following information should be provided for each investigator and other senior personnel. Failure to provide this information may delay consideration of this proposal. | |
| Investigator: Omer Reichman | Other agencies (including NSF) to which this proposal has been/will be submitted. |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: Deploying Information Management Tools and Increasing Analytical Capabilities of Scientists Through the National Center for Ecological Analysis and Synthesis Source of Support: The Andrew W. Mellon Foundation Total Award Amount: \$ 300,000 Total Award Period Covered: 03/23/05 - 03/31/07 Location of Project: NCEAS, UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.45 Sumr: 0.00 | |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: Knowledge and Capacity-Building to Support Ecosystem-Based Management for Sustainable Coastal-Marine Systems Source of Support: The David and Lucile Packard Foundation Total Award Amount: \$ 1,859,855 Total Award Period Covered: 06/20/04 - 06/20/07 Location of Project: NCEAS, UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.09 Sumr: 0.00 | |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: Postdoctoral Training in the Management of Environmental Information: A Proposal to the Andrew W. Mellon Foundation Source of Support: The Andrew W. Mellon Foundation Total Award Amount: \$ 450,000 Total Award Period Covered: 09/01/01 - 08/31/06 Location of Project: NCEAS, UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.09 Sumr: 0.00 | |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: CRB: The Role of Seed Limitation, Resource Competition, and Community Complementarity in Invasions and Restorations (Reichman/Schimel/Seabloom) Source of Support: NSF DEB 0235624 Total Award Amount: \$ 364,197 Total Award Period Covered: 02/01/03 - 01/31/06 Location of Project: UCSB, Sedgwick Reserve Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.09 Sumr: 0.00 | |
| Support: <input checked="" type="checkbox"/> Current <input type="checkbox"/> Pending <input type="checkbox"/> Submission Planned in Near Future <input type="checkbox"/> *Transfer of Support Project/Proposal Title: SGER: Does Manipulation of Top Predators Lead to Rapid Shifts in the Structure of Ecological Communities? (Orrock/Reichman) Source of Support: NSF DEB 0502069 Total Award Amount: \$ 43,571 Total Award Period Covered: 12/15/04 - 11/30/05 Location of Project: UCSB Person-Months Per Year Committed to the Project. Cal: 0.00 Acad: 0.09 Summ: 0.00 | |
| *If this project has previously been funded by another agency, please list and furnish information for immediately preceding funding period. | |

FACILITIES, EQUIPMENT & OTHER RESOURCES

FACILITIES: Identify the facilities to be used at each performance site listed and, as appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Use "Other" to describe the facilities at any other performance sites listed and at sites for field studies. USE additional pages as necessary.

Laboratory:

Clinical:

Animal:

Computer: **Computer Facilities:**
NCEAS maintains a high-performance, heterogeneous, networked computing environment for resident and visiting researchers. The internal backbone consists of 1 Gigabit and 100 Megabit switched ethernet, with 802.11a/b/g

Office: **Office Facilities:**
The Center is located on 1.25 floors in the Balboa Building in downtown Santa Barbara. The space includes two meeting rooms (holding approximately 20 and 10 people) where participants in Working Groups work.

Other:

MAJOR EQUIPMENT: List the most important items available for this project and, as appropriate identifying the location and pertinent capabilities of each.

OTHER RESOURCES: Provide any information describing the other resources available for the project. Identify support services such as consultant, secretarial, machine shop, and electronics shop, and the extent to which they will be available for the project. Include an explanation of any consortium/contractual arrangements with other organizations.

FACILITIES, EQUIPMENT & OTHER RESOURCES

Continuation Page:

COMPUTER FACILITIES (continued):

wireless throughout the premises. Internet connectivity is achieved via a dedicated T3 line to the UCSB campus, which in turn provides a 1 Gbps optical link to the Internet via the CalREN2 network.

NCEAS maintains a number of database and analytical servers, ranging from multi-CPU Poweredge servers running Linux, to SGI Origin 2100/2000 systems running IRIX. Online storage is achieved via a 2 terabyte shared RAID array, with several ancillary RAID devices. Backup is provided nightly via a 15 tape robotic SDLT with 3 terabytes of capacity. All servers and network components are in an environmentally controlled room with uninterruptible power supplies.

High-end PC and Macintoshes are available to residents running Windows XP, OSX, or Linux. NCEAS supports a number of scalable, multi-platform scientific software packages, including SAS, MATLAB, R, ArcGIS, and parallelizable compilers for Fortran 77/90, and C++/C. Oracle is our primary database for administrative needs, with other databases running under PostgreSQL and MySQL. We provide access to a range of networked peripherals including printers (laserjet, and color inkjet), scanners, photo-recorders, smart whiteboards, and data projectors, as well as internet-based audiovideoconferencing. We provide NCEAS' clients with all major Internet services, including Email (imap), Web, DNS, networked filesystems (SMB and NFS), database development and deployment, and rich technical support for end-user systems as well as complex scientific software.

OFFICE FACILITIES (continued):

Working Groups also have access to breakout rooms and rooms with specialized computing capabilities.

The Center has 30 offices that house the staff and resident scientists (2 Postdoctoral or one sabbatical fellow/office). Centered in the space is a large lounge that provides meeting space and a small kitchen area to service the resident and visiting scientists and the staff.