

ANNUAL REPORT
CENTER FOR ENVIRONMENTAL DIAGNOSTICS
AND
BIOREMEDIATION

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Prepared by

K. Ranga Rao
Professor of Biology
University Research Professor
Director, CEDB

The University of West Florida
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The Center for Environmental Diagnostics and Bioremediation (CEDB) was established in 1990 to enable the University of West Florida to implement new collaborative research programs in applied environmental sciences, and to enhance educational and training opportunities for undergraduate and graduate students. The E&G funds provided for the Center are utilized to recruit tenure-earning faculty whose expertise is in contemporary molecular biology, microbiology, genetics, and environmental assessment. These core faculty, along with other research faculty (not tenure-earning; funded largely by extramural grants), enable the CEDB to serve as a unique resource to build viable research programs pertinent to the assessment and improvement of environmental health, to provide opportunities for undergraduate and graduate students to participate in contemporary research endeavors, to enrich the curriculum through course offerings, and to contribute to public service.

I. Goals/Objectives for 2003-2004

A. Contribute to the success of degree programs in natural and health sciences through classroom instruction, special seminars, field and laboratory experiences, directed studies, and research participation opportunities provided by the CEDB faculty.

Assessment measures

Courses taught; academic advising; student recruitment and retention activities; supervision of directed studies; supervision of thesis research; number of students supported; educational and career development benefits.

Assessment findings

Although the CEDB faculty members were heavily involved in externally-funded research programs, they made significant contributions to the biology curriculum. They taught core course in *Ecology* and *Microbiology* (both courses taught in Fall and Spring), coordinated the *Biology Seminar* course (Fall and Spring), and offered several elective courses: *Marine Ecology*, *Marine Field Ecology*, and *Marine Biotechnology*. In support of the field-oriented courses, CEDB faculty secured grants for ship time from the Florida Institute of Oceanography.

In addition to the above course offerings, CEDB faculty supervised 30 Directed Studies for undergraduate and graduate students and thesis research for 17 graduate students. Collectively, CEDB faculty generated 619 undergraduate credit hours and 120 graduate credit hours in 2003-2004. Importantly, CEDB faculty enriched the education and training of students by integrating contemporary research with teaching advances in diverse fields. Assessment of teaching effectiveness through the portfolios for annual evaluation, including course materials, performance in examinations, and student evaluations indicate that the CEDB faculty members are excellent teachers.

During 2003-2004 CEDB provided financial support and research opportunities for 10 graduate students and 33 undergraduate students. Progress reports and interviews indicate that the educational experience of students is substantially enhanced by participation in contemporary research, training in emerging technologies, and integration of theoretical knowledge with laboratory experimentation and field studies. Many of the participating students utilized the research opportunities to conduct directed individual studies for academic credit or for thesis projects (at the graduate level). The outcomes of student participation in scholarly endeavors

resulted in co-authorship for students on nearly 70% of the publications and presentations at professional meetings by CEDB personnel.

The CEDB faculty has also participated in student recruitment efforts at UWF (i.e., Admissions Phone-A-Thon; UWF Saturday Open House for prospective students). By engaging in these activities, academic advising, research training, and teaching of six different courses, the CEDB faculty plays an important role in the education and training of students. The integration of research expertise and opportunities with formal teaching is a noteworthy contribution of the CEDB towards the enrichment of biology curriculum.

Program decisions

The CEDB Director discussed the assessment results with the Chair of Biology Department, in which the CEDB faculty have tenure or tenure-earning status, and during faculty meetings. The resulting decisions are as follows.

1. The CEDB Director and the Chair of the biology department will ensure that reasonable opportunities will be provided to the faculty for teaching formal courses, taking into consideration that commitments to grant-funded research are met.

2. With increasing opportunities for environmental health studies, recruitment of additional faculty with joint appointments in CEDB and Biology can lead to the enrichment of the curriculum as well as enhanced research endeavors.

3. Encourage faculty to continue to seek financial support from external sources to support field-oriented training courses and to provide financial support for undergraduate and graduate students to participate in research activities.

The CEDB Director is responsible for follow-up actions, and has already included appropriate requests among strategic planning priorities submitted to the Provost.

B. Conduct basic and applied research pertinent to the diagnosis and improvement of environmental health, addressing issues of regional, national, and global importance. These endeavors are aimed to be collaborative and interdisciplinary, involving faculty and students as well as colleagues in consortia at other institutions, and facilitate the creation and dissemination of knowledge.

Assessment measures

Funding received from external sources; publications and reports; presentations at professional meetings; research participation opportunities for students and associates; successful partnerships and consortia.

Assessment findings

CEDB continued to be highly successful in securing external support for research, largely through peer-reviewed, national-level, competitive grants from agencies such as the National Science Foundation (NSF), Environmental Protection Agency (EPA), U.S. Department of Agriculture (USDA), and National Oceanic and Atmosphere Administration (NOAA). External support for single-year and multi-year projects in force during 2003-2004 in the CEDB amounted to \$7,148,230, including \$2,696,634 of new funding received during the year.

The above support enabled the CEDB faculty to continue basic and applied research in diverse areas such as molecular biology, biochemistry, microbial ecology, marine ecology, photobiology, and also to undertake research projects targeted to address concerns related to environmental pollution and health outcomes in Northwest Florida.

In order to pursue the various interdisciplinary projects, CEDB established collaborative relations with faculty from several disciplines at UWF (e.g., biology; environmental studies; education; economics; library science), local public school teachers, Escambia and Santa Rosa County Health Department, and a number of academic institutions in the country and abroad. The latter include: LeHigh University, MD Anderson Cancer Center, University of Wisconsin-LaCross, Temple University, Franklin and Marshall College, Oklahoma State University, Smithsonian Institution, University of Southern Mississippi, Florida State University, University of Florida, University of South Florida, University of Alabama, Auburn University, Louisiana State University, University of Texas, University of Maryland, University of Washington, Georgia Institute of Technology, and Institut National des Sciences de l'Univers (INSU, CNRS, France). These strategic partnerships are an asset for promoting cutting-edge research, as well as for being responsive to regional, national and global needs.

CEDB takes special pride in offering research participation opportunities for students and visiting scholars. This year CEDB provided financial support and research opportunities for: 39 undergraduate students, 10 graduate students, 10 assistants/associates, 7 post-doctoral research associates, and 5 faculty collaborators at our institution.

CEDB's scholarly output during the year included: 19 technical reports; 9 publications in peer-reviewed journals; 30 presentations and invited seminars. Near 70% of the publications and presentations included students as co-authors.

The above findings indicate that CEDB was highly successful in meeting the goals/objectives for creative and scholarly activities. Grants in force, publications, and presentations during 2003-2004 are listed below.

Current Projects

Lexen: Glacial Hitchhiking: Mechanism for Bacterial Speciation, (PI: <i>W. Jeffrey</i>), NSF , 10/01/00 – 09/30/03	\$ 124,507
Impact of Agricultural Runoff on Total Maximum Daily Loads (PI: <i>J. Lepo</i> and <i>R. Snyder</i>), U.S. Department of Agriculture , 9/15/01 - 9/14/04	\$ 532,000
Microbial Biofilms as Indicators of Estuarine Ecosystem Condition, (PI: <i>J. Lepo</i> and <i>R. Snyder</i>), Part of Consortium for Estuarine Ecoindicators Research for the Gulf of Mexico, STAR EaGLes Cooperative Agreement, USEPA , 11/1/01 - 8/31/05	\$1,563,111
Collaborative Proposal: Interactive Effects of UV Radiation and Vertical Mixing on Phytoplankton and Bacterial Productivity of Ross Sea Phaeocystis Blooms, (PI: <i>W. Jeffrey</i>), NSF , 9/1/02-8/31/05	\$ 356,109

The Interactive Effects of UV Radiation and Temperature on Lake Ecosystems. Integrated Research Challenges in Environment, (PI: <i>W. Jeffrey</i>), NSF , 10-/1/02 - 9/30/07	\$ 263,626
Assessment of Environmental Pollution and Community Health in Northwest Florida, (PI: <i>K. R. Rao</i>), EPA , 7/1/02 - 6/30/06	\$1,819,075
Environmental Health Studies in Escambia and Santa Rosa Counties, Florida, (PI: <i>K. R. Rao</i>), CDC , 8/1/02 - 9/29/04	\$ 832,233
Phytopathogens as Bioterrorism Agents 2003, (PI: <i>J. Lepo</i>), University of South Florida (US Army) , 10/01/02 - 2/28/04	\$ 394,047
Biological Survey of FCT Project #96-034-P7A, (PI: <i>R. Snyder</i>), West Florida Regional Planning Council , 1/1/03 - 6/30/04	\$ 2,400
Wet Prairie Habitat Restoration Evaluation and Management Strategies for Garcon Point Water Management Area 2004, (PI: <i>R. Snyder</i>), NW Florida Water Management District , 4/1/03 - 3/31/04	\$ 7,081
Evaluation of Ciliate Protozoans as a First Food for Red Snapper <i>Lutjanus campechanus</i> Larvae, (PI: <i>R. Snyder</i>), NOAA National Marine Fisheries Service , 5/1/03 - 10/31/04	\$ 87,151
Biological Impacts of Crop Production Systems in Transition from the Use of Methyl Bromide, (PI: <i>K. Martin</i>), U.S. Department of Agriculture , 5/31/03 - 5/30/06	\$ 15,000
Tracking Source of Fecal Contamination in Environmental Waters, (PI: <i>J. Lepo</i>), Florida Department of Health, Escambia County Health Department , 9/15/03 - 6/30/04	\$ 100,000
Phytopathogens as Bioterrorism Agents 2004, (PI: <i>J. Lepo</i>), University of South Florida (US Army) , 11/1/03 - 10/30/04	\$ 305,532
Water Quality Microbiological Analysis of Bathing Places FY 2004, (PI: <i>J. Lepo</i>), Florida Department of Health, Escambia County Health Department , 7/1/03 - 6/30/04	\$ 46,427
Health Beaches Sampling for Okaloosa County, (PI: <i>J. Lepo</i>), Florida Department of Health, Okaloosa County Health Department , 7/1/03 - 6/30/04	\$ 24,950

Microbiological Indicators of Water Quality in Submerged Karst Caves of Northern Florida, (PI: <i>R. Snyder</i>), Florida DEP , 12/2/03 - 6/30/04	\$ 44,995
RUI: Effect of Diurnal and Weekly Water Column Hypoxic Events on Nitrification and Nitrogen Transformations in Estuarine Sediments, (PI: <i>J. Caffrey</i>), NSF , 3/15/04 - 12/31/06	\$ 450,405
Oceanographic Sampling Methodolies (Shiptime), (PI: <i>W. Jeffrey</i>), Florida Institute of Oceanography , 06/25/04 – 06/27/04	\$ 9,000
Estuarine Ecology Shipboard Laboratory (Shiptime), (PI: <i>R. Snyder</i>), Florida Institute of Oceanography , 06/29/04 – 06/30/04	\$ 6,000
U. S. – France Cooperative Research: Effect of Nutrient Limstian on Response of Marine Bacterioplankton to Solar Ultraviolet Radiation, (PI: <i>W. Jeffrey</i>), NSF , 02/15/04 – 01/31/07	\$ 18,000
Importance of Microalgal Production on the Northern Gulf of Mexico Sand Bottom Nutrient Trapping and Support of Fisheries Production, (PI: <i>R. Snyder</i>), Escambia County , 04/20/04 – 12/30/05	\$ 24,000
Wet Prairie Habitat Restoration Evaluation and Management Strategies Agreement for the Garcon Point Water Management Area, (PI: <i>R. Snyder</i>), Northwest Florida Water Management District , 05/01/04 – 04/30/05	\$ 7,081
Environmental Monitoring of Bathing Places, (Co-PIs: <i>R. Snyder, J. Macauley, And J. Lepo</i>), Florida Department of Health, Escambia County Health Department , 07/01/04 – 06/30/05	\$ 39,000
Fecal Source Tracking Research, (Co-PIs: <i>J. Lepo and R. Snyder</i>), Florida Department of Health, Escambia County Health Department , 07/01/04 – 06/30/05	\$ 76,500

Publications and Presentations

Publications

Edwards, K. R., J. E. Lepo, and M. A. Lewis. 2003. Toxicity Comparison of Biosurfactants and Synthetic Surfactants Used in Oil Spill Remediation to Two Estuarine Species. *Marine Pollution Bulletin* 46:1309-1316.

Lepo, J. E., C. R. Cripe, S. Zhang, J. L. Kavanaugh, and G. P. Norton. The effect of amount of crude oil on extent of its biodegradation in open water- and sandy beach- laboratory simulations. *Environ. Technol.* 24 (10): 1291-1302.

Martin, K. J., J. M. Henson, L. L. Phillips, R. A. Brooks and J. E. Lepo. 2003. Phytopathogens as Bioterrorism Agents. Proceedings of the Annual Meeting of the Consortium of Biological Defense Researchers. (Soldiers Biological Chemical Command; SBCCOM) 28 - 30 April 2003. Lubbock, Texas.

Kiely, C. L., R. A. Snyder, A. M. Lazur, and J. E. Lepo. 2004. Evaluation of a Vegetated Filter Strip as a Best Management Practice for Treating Catfish Pond Stormwater Effluent. *Global Aquaculture Advocacy* 7:67-68.

Comment [JL1]: Is now in print.

Nocker A., J. E. Lepo, and R. A. Snyder. 2004 Diversity of microbial biofilm communities associated with an oyster reef and an adjacent muddy-sand bottom habitat. Submitted, *Appl. Environ. Microbiol. In Press*.

Comment [JL2]: Now In Press. Would you like a manuscript appended?

Lepo, J. E., and J. M. Henson. 2004. *Agricultural Bioterrorism: Risk, Diagnosis, Control, Prevention, the Future*. Invited Review Chapter In "Emerging Concepts in Plant Health Management." *In Press*.

Snyder, R. A., M. A. Lewis, A. Nocker, and J. E. Lepo. 2004. Microbial biofilms as integrative sensors of environmental quality. In "Estuarine Indicators," (S.A. Bortone, ed.), CRC Press. *In Press*.

Simmon, K., D. Steadman, S. Durkin, A. Baldwin, W.H. Jeffrey, P. Sheridan, R. Horton and M.S. Shields. 2004. An autoclave method for rapid preparations for bacterial PCR template DNA. *Journal of Microbiological Methods.* 56: 143-149.

MacFadyen, E.J., C.E. Williamson, G. Grad, M. Lowery, W.H. Jeffrey, and D.L. Mitchell. 2004. Molecular Response to Climate Change: Temperature Dependence of UV-induced DNA Damage and Repair in the Freshwater Crustacean *Daphnia pulex*. *Global Change Biology* 10: 408-416.

Presentations and Invited Seminars

Lepo, J. E. 2003. *Tracking Sources of Fecal Contamination in Environmental Waters.* Presented to Comprehensive Meeting of the EPA Gulf of Mexico Program Focus and Project Teams. New Orleans, Louisiana. 26 June 2003.

Lepo, J. E. 2003. *Microbial Biofilms as Indicators of Estuarine Condition.* Seminar to Department of Biology, University of Mississippi, Oxford, Miss. 31 October 2003.

Lepo, J. E., K. J. Martin, L. L. Phillips, R. Brooks, T. Huggins, and J. M. Henson. 2004. Early Detection and Diagnosis of Phytopathogens as Bioterrorism Agents: Progress into Year 3. 5th Annual Meeting of the Consortium for Biodefense. Clearwater Beach, Fla. 13 May 2004.

Phillips, L. L., R. A. Brooks, K. J. Martin, and J. E. Lepo. 2003. Combining QPCR and TRFLPs to detect bioterrorism agents on plant surfaces. Annual Meeting of the American Phytopathological Society. 9 – 13 August 2003. Charlotte, North Carolina.

Martin, K. J., L. L. Phillips, R. A. Brooks, and J. E. Lepo. 2003. Combining real-time quantitative PCR with terminal restriction fragment length polymorphism methods to detect crop-bioterrorism agents. Annual Meeting of the Soil Science Society of America. Denver, Colorado. 9 November 2003.

Snyder, R.A., J. E. Lepo, A. Nocker, L. Proctor, L. Pennington, J. Moss, and T. Huggins. 2003. Microbial biofilms as indicators of estuarine condition. Estuarine Research Federation Annual Meeting; Seattle, WA. 14-18 September 2003.

Nocker, A., R.A. Snyder, J. E. Lepo, J.A. Moss, and T. Huggins. 2003. Molecular analysis of habitat specificity in estuarine microbial biofilm community structures. Estuarine Research Federation Annual Meeting; Seattle, WA. 14-18 September 2003.

Moss, J.A., R.A. Snyder, and J. E. Lepo. 2003. Fluorescein diacetate hydrolysis as a surrogate for microbial heterotrophic activity in estuarine biofilms. Estuarine Research Federation Annual Meeting; Seattle, WA. 14-18 September 2003.

Pennington, L.J., R.A. Snyder, J. E. Lepo, M. Ederington-Hagy, A. N. Rondon, and R. H. Davis. 2003. Habitat Fidelity of Estuarine Microbial Biofilms determined from analysis of phospholipids. Estuarine Research Federation Annual Meeting; Seattle, WA. 14-18 September 2003.

Proctor, L. M. S. MacAuley, J. E. Lepo, R. Snyder, and A. Nocker. 2003. Characterization of N-Cycling Microorganisms in Biofilms from Estuarine Environments in the Gulf of Mexico. Estuarine Research Federation Annual Meeting; Seattle, WA. 14-18 September 2003.

Lepo, J. E., A. M. Lazur, R. A. Snyder, C. L. Kiely, and M. E. Griggs. 2004. Evaluation of a Vegetated Filter Strip as a Best Management Practice for Treating Catfish Pond Stormwater Effluent. Presented at the Annual Meeting of the World Aquaculture Society, 1 – 5 March 2004; Honolulu, Hawaii.

Phillips, L. L., K. J. Martin, J. E. Lepo. 2004. Analysis of Fungal Epiphytic Communities on Leaves of Crops by LHPCR and QPCR. 5th Annual Meeting of the Consortium for Biodefense. Clearwater Beach, Fla. 11 – 14 May 2004.

Nocker, A., J. E. Lepo, L. L. Martin, J. Moss, A. D. Launder, R. A. Snyder. 2004. Molecular Analysis of Microbial Biofilm Communities in a Sewage Outfall Impacted Environment in Comparison with a Reference Site in Pensacola Bay, Florida. 104th Annual Meeting of the American Society for Microbiology, 22- 25 May 2004; New Orleans, Louisiana. Abstract no. I-039.

Brooks, R. A., T. L. Huggins, K. J. Martin, J. E. Lepo. 2004. Analysis of Bacterial Epiphytic Communities on Crops by TRFLP and QPCR as Potential Indicators of Agricultural Terrorist Events. 104th Annual Meeting of the American Society for Microbiology, 22- 25 May 2004; New Orleans, Louisiana. Abstract no. Y-091.

Kiely, C. L., R. A. Snyder, M. Wagner, J. Allison, A. D. Launder, and J. E. Lepo. 2004. Microbial Ecology of a Grass-Filter-Strip Best Management Practice for Attenuation of Nutrients and Suspended Solids in Overflow Discharge from a Catfish Aquaculture Pond. 104th Annual Meeting of the American Society for Microbiology, 22- 25 May 2004; New Orleans, Louisiana. . Abstract no. N-078.

Phillips, L. L., K. J. Martin, J. E. Lepo. 2004. Analysis of Fungal Epiphytic Communities on Leaves of Crops by LHPCR and QPCR. 104th Annual Meeting of the American Society for Microbiology, 22- 25 May 2004; New Orleans, Louisiana. Abstract no. N-186.

Brewer, E.N., K.J. Martin, and J.E. Lepo. 2004. Terminal Restriction Length Polymorphism Analysis to Identify Bacterial Source Indicators. 104th Annual Meeting of the American Society for Microbiology, 22- 25 May 2004; New Orleans, Louisiana. Abstract no.X-xxx.

Snyder, R.A., A. Nocker, L. Proctor and J.E. Lepo. 2004. Estuarine microbial biofilms as integrative sensors of environmental quality. International Symposium for Microbial Ecology, annual meeting, Cancun, Mexico.

Moss J., A. Nocker, J. E. Lepo, and R. A. Snyder. 2004. Temporal dynamics of estuarine microbial biofilm community structure. International Symposium for Microbial Ecology, annual meeting, Cancun, Mexico.

Jeffrey, W. H. 2003. The power of partnerships between scientists and educators for promoting ocean science in Florida. Florida Center for Ocean Science Education Excellence (FCOSSEE) Florida Community Building Workshop, Tallahassee. FL. May 17.

Jeffrey, W. H. 2003. Molecular and physiological effects of ultraviolet radiation on marine bacterioplankton. Université Pierre et Marie Curie (Paris VI), Observatoire Océanologique. Banyuls-sur-Mer, France. June 6.

Jeffrey, W. H. 2003. Molecular and physiological effects of ultraviolet radiation on marine bacterioplankton. Annual Meeting American Society for Photobiology, Baltimore, MD. July 5-9.

Jeffrey, W. H. 2003. Molecular and physiological effects of ultraviolet radiation on marine bacterioplankton. Annual Meeting American Society for Photobiology, Baltimore, MD. July 5-9.

Meador, J. W. H. Jeffrey, and D.L. Mitchell,. 2003. Characterization of diverse photobiological responses of marine bacterioplankton. Annual Meeting American Society for Photobiology, Baltimore, MD. July 5-9.

Jeffrey, W. H., J.D. Meador, J.D. Pakulski, T.A. Douki, A.J. Baldwin, and D.L. Mitchell. 2004. Solar induced DNA photoproducts across a latitudinal gradient in the eastern Pacific ocean. American Society for Limnology and Oceanography Meeting, Honolulu, HI. February 15-20.

Baldwin, A.J., J.D. Pakulski, and W. H. Jeffrey. 2004. Effects of prolonged solar exposure on bacterial response to UVR along a latitudinal gradient. American Society for Limnology and Oceanography Meeting, Honolulu, HI. February 15-20.

Pakulski, J.D., A.J. Baldwin, R. Stephens, J. Moss, and W. H. Jeffrey. 2004. Variable responses of heterotrophic bacteria to surface solar conditions in the Pacific ocean. American Society for Limnology and Oceanography Meeting, Honolulu, HI. February 15-20.

Mioni, C.E., S.M. Handy, M.R. Twiss, J. Sudre, R.D. Frew, W. H. Jeffrey, P.W. Boyd, V. Garcon, and S.W. Wilhelm. 2004. Deployment of a heterotrophic bioluminescent bioreporter to estimate the bioavailability of iron in seawater. American Society for Limnology and Oceanography Meeting, Honolulu, HI. February 15-20.

Snyder, R. A., J.E. Lepo, and M.A. Lewis, 2003. Microbial Biofilms as Integrative Sensors of Environmental Quality. Estuarine Indicators Workshop, Sanibel Island, FL. October 29-31

Snyder, R. A., A. Launder, A. Nocker, A. Rogerson, W. Huth, and R. Dehan. 2004. Microbiological indicators of water quality in submerged karst caves of Wakulla Springs. Wakulla Springs Scientific Symposium, Tallahassee, FL. May 13. Florida Geologic Survey.

Karouna-Renier, N.K., R.A. Snyder, J. G. Allison, M. E. Wagner, and K. R. Rao. 2004. Contaminant residues in blue crabs and oysters from the Pensacola Bay region. Fourth SETAC World Congress, Portland, OR.

Mohrher, C.J., J. Liebens, J. E. Lepo, and K. R. Rao. 2004. Profiles of pollutants impacting Bayou Texar, Pensacola, FL. Fourth SETAC World Congress, Portland, OR.

Program Decisions

The CEDB Director discussed the findings at faculty meetings, resulting in the following conclusions and decisions.

1. With only four full-time faculty (including the Director), it would be extremely difficult to expand research programs.
2. Additional doctoral-level scientists are needed to successfully implement the current projects and to expand the research programs. Through national search, one post-doctoral research associate has been recruited to join the Center in August 2003. Search will be resumed in Fall 2003 to recruit a replacement for a vacant tenure-track faculty position.
3. The CEDB Director will seek institutional resources to recruit additional tenure-earning faculty with a joint appointment in biology or environmental sciences, to take advantage of the emerging opportunities for applied environmental research.
4. Some of the new projects require new equipment. The CEDB Director provided needed funds through the Center's seed funds, carry-forward funds, and salary savings.
5. Encourage faculty to develop and maintain productive partnerships with appropriate agencies and institutions to facilitate interdisciplinary efforts and to ensure high quality outcomes.
6. Encourage faculty to continue to seek external support to provide opportunities for students, assistants/associates, and post-doctoral trainees to participate in contemporary research.

C. Render service to aid in the governance and orderly functioning of the institution, and lend expertise to the profession towards the advancement of science.

Assessment Measures

Service on committees within the institution; assistance in student recruitment, advising, and retention; service as reviewers for funding agencies and professional journals; and service to professional organizations.

Assessment Findings

In order to aid in the governance and orderly functioning of the institution, CEDB faculty served on 13 different committees, (e.g., University Health and Safety Committee; University Employee Benefits Committee; Search Committee for Provost; Faculty Senate; Sponsored Research Advisory Committee).

In support of student recruitment and retention, CEDB faculty participated in UWF Saturday Open House for Prospective Students and provided academic advising to 90+ students in biology and marine biology programs.

Professional service at the external level included leadership positions (Dr. W.H. Jeffrey, Chair, Florida Institute of Oceanography Advisory Committee; Chair, Raytheon Polar Services [NSF Office of Polar Programs] Palmer Area Users Committee), and service as reviewers of journal articles and research proposals. Collectively CEDB faculty reviewed more than 20 articles for 14 different journals, and also provided assistance through service on editorial boards (e.g., Dr. R.A. Snyder, *Journal of Eukaryotic Microbiology*; Dr. W. H. Jeffrey, Associate Editor, *Limnology and Oceanography*). CEDB faculty served on peer-review panels for: Department of Homeland Security, Post-Harvest Food Security Centers; NSF Biological Oceanography

Program; NSF Ocean Sciences; and USDA Cooperative State Research, Education and Extension Service Competitive Programs. In addition, they also reviewed research proposals for diverse agencies: NSF Ecological Studies, NSF Biological Oceanography Program, NSF Biodiversity Surveys and Inventories Program, Sea Grant Programs (Delaware, Connecticut/New York, and Texas), and Israel Research Foundation. These activities attest to the external recognition of the scholarship and expertise of CEDB faculty in their respective fields.

Program decisions

The CEDB Director discussed the assessment findings at faculty meetings and came to the following decisions.

1. The CEDB's service activities have been numerous, diverse, and beneficial for the institution and profession.
2. Notwithstanding the increasing work load generated by the continuing and new research grants, teaching and academic program support in biology, the CEDB faculty members are encouraged to continue their professional service contributions at the present level.

The CEDB Director will facilitate participation in service endeavors and make appropriate resources available in support of pertinent activities.

D. Serve as a regional resource for information and advice pertinent to environmental health issues, and assist the community, public schools, and economic development efforts.

Assessment measures

Communications through news media; service on regional committees; partnership with regional organizations to address issues pertinent to the region; activities related to science education.

Assessment findings

CEDB serves as a regional resource for information and advice pertinent to environmental health issues. This service was rendered through opinions and advice, as noted in the articles/reports released through newspaper, radio, and TV media, as well as through displays at public events (e.g., Festival on the Green; UWF Capitol Day) and work on diverse advisory committees. Collectively CEDB faculty served on 13 different committees for regional organizations.

Examples include:

- Dr. K.R. Rao, Member, Environmental Advisory Committee, Pensacola Chamber of Commerce.
- Dr. R.A. Snyder, Chairman, Advisory Board, South Santa Rosa Utilities Inc.
- Dr. J.E. Lepo, Member, Environmental Advisory Board, City of Pensacola.
- Dr. J.E. Lepo, Citizens Environmental Committee, Escambia County.

CEDB contributed to economic development goals by identifying critical needs and pursuing research relevant to the diagnosis and improvement of environmental and community health. CEDB established a strategic alliance, Partnership for Environmental Research and Community Health (PERCH), with the health departments of Escambia and Santa Rosa counties and succeeded in securing federal funds, to launch a major research program aimed at addressing concerns on environmental pollution and public health outcomes in Northwest Florida. Additionally, CEDB assisted the Escambia and Okaloosa County health departments in assessing water quality in bathing/recreational waters through certified analyses done at the Wetlands Research Laboratory. These endeavors, along with continued involvement in environmental projects pertinent to the West Florida Regional Planning Council, Northwest Florida Water Management District, Three Rivers RC & D Council, and U.S. Department of Agriculture (Escambia County Extension), Florida DEP, Florida DOH, and Florida Fish and Wildlife Service, illustrate the important role CEDB plays in serving the regional community.

It is noteworthy that CEDB's effective management of the Wetlands Research Laboratory (WRL), securing certification through NELAC (National Environmental Laboratory Accreditation Conference) for WRL's environmental analyses, and rendering the WRL a core facility for analytical services (accessible to all the faculty interested in environmental sciences), are providing increased opportunities for our institution to engage in research programs aimed at the assessment and improvement of environmental health, an important attribute for sustaining economic development in the region.

CEDB contributed its expertise towards science education in public schools. CEDB's activities for 2003-2004 included:

- Judge, Science Fair
- Displays for Bay Day (Middle school students, County wide)
- Volunteer Teacher, Gulf Breeze Elementary School
- Internships for middle school and high school science teachers (provided through a research grant from USDA).
- Summer Science Teacher Training Workshops
- Presentations at Oriole Beach Elementary School, Pace High School, and OWCC Mattie Kelly Center

Program decisions

The CEDB Director discussed the assessment findings at faculty meetings and came to the following decisions.

1. The CEDB's service activities pertinent to the community, public schools, and economic development have been appropriate, diverse, and beneficial.
2. Notwithstanding the increasing workload generated by the continuing and new research grants, teaching and academic programs supported in biology, the CEDB faculty members are encouraged to continue their professional contributions to the community at the present level.

3. In view of the importance of the core analytical facility (WRL) for environmental health assessments, the recently completed renovation of this facility will facilitate effective operations. Recruitment and retention of qualified technical personnel are continuing challenges.

4. The CEDB Director will oversee the above activities, facilitate participation in service endeavors in the community, and make appropriate resources available in support of pertinent activities.

II. Major accomplishments and changes in programs and services for 2003-2004

A. External funding received by the CEDB for new and continuing multi-year projects in 2003-2004 amounted to \$2,696,634 which included funding derived through peer-reviewed, national level competitive grants from EPA, NSF, and NOAA.

B. The CEDB formed a Partnership for Environmental Research and Community Health (PERCH) in collaboration with the health departments of Escambia and Santa Rosa Counties, secured funding through EPA and CDC to conduct environmental health studies in Northwest Florida, and is conducting a comprehensive research effort involving collaborators from the University of South Florida and Georgia Institute of Technology.

C. The CEDB also strengthened partnerships (through formation of four separate consortia) with diverse institutions in the country to pursue interdisciplinary research projects: Science to Achieve Results: Estuarine and Great Lakes Program; Bioterrorism; Integrated Research Challenges in the Environment; Research in the Antarctica.

D. The Wetlands Research Laboratory (WRL), now state of Florida certified to meet NELAC (National Environmental Laboratory Accreditation Conference) standards, provided analytical services in support of diverse externally-funded projects in CEDB, Biology, and Environmental Studies. The WRL has increased its analytical services for environmental microbial monitoring conducted by the Escambia County Health Department, and initiated similar services for healthy beaches monitoring carried out by the Okaloosa County Health Department.

E. The WRL facilities have been renovated to provide expanded laboratory space and improved infrastructure for effective operations.

F. Personnel changes. Dr. Jane Caffrey resumed her appointment as Research Assistant Professor. Dr. Natalie Karouna-Renier joined as a post-doctoral Research Associate.

III. Goals/Objectives for 2004-2005

A. Fill the WRL technical assistant positions to be vacated in August 2004.

B. Fill the post-doctoral research associate position to be vacated in the CEDB in Fall 2004.

C. Continue PERCH research projects, and other projects pertinent to regional environmental health.

D. Continue to maintain a productive research program.

E. Continue to provide financial support and research opportunities for students and professionals.

F. Continue to augment and supplement the course offerings and academic program support in the affiliated academic departments.

G. Continue to provide service to the institution, profession, and community.

IV. Priorities/Goals for 2005-2009

A. Recruit additional tenure-track faculty in the areas of environmental chemistry, environmental modeling/risk assessment, molecular diagnostics, and toxicology.

B. Recruit an additional USPS staff member in support of expanding activities in the CEDB and WRL.

C. Expand office/laboratory facilities for CEDB, in conjunction with facilities expansion for biology and/or life and health sciences.

D. Strengthen collaboration among the various academic units within the university to foster interdisciplinary programs in environmental/community health studies in the region.

E. Strengthen interinstitutional partnerships to foster interdisciplinary research programs of national priority.

F. Maintain a productive research program.

G. Augment and supplement the course offerings and program support in the affiliated academic department(s).

H. Maintain a strong record of service to the institution, profession, and community.

V. Principal Unmet Budgetary Needs

A. Recruit a new support staff member (USPS) to handle the increasing workload in the office, which presently has only one staff member. (Budget request: \$28,600 for salary and benefits, 1.0 FTE, 12-month, staff member).

B. Recruit new faculty members to expand research programs, increase teaching contributions, and leverage emerging regional opportunities for partnerships and services pertinent to economic development. (Budget request: \$107,250 for salaries and benefits; 1.5 FTE Assistant Professor positions; 9-month pay plan).

C. Increase expense budget for CEDB. The history of allocation is: \$50,000 (1990-1991); \$38,500 (1991-2003); \$23,500 (2003-2004, owing to voluntary reduction to accommodate institutional budget reduction). (Budget request: Restore expense budget to 1990-91 level of \$50,000 by \$10,000 increments per year over the next three years (2004-2006).

VI. Distinguished Individual Accomplishments

Dr. W.H. Jeffrey received an US-France collaborative research grant from the National Science

Foundation. He was appointed as Associate Editor, *Limnology and Oceanography*.

Drs. J.E. Lepo and **R.A. Snyder** succeeded in obtaining continuing support for competitive multi-year grants from the Environmental Protection Agency and the U.S. Department of Agriculture. (Total support: \$2,095,111).

Dr. R.A. Snyder succeeded in securing continuing support from state and regional agencies.

Dr. J.E. Lepo enhanced the ongoing research in plant pathogens by securing additional support and establishing productive working relationships with collaborators at USF. (Total support: \$788,329).

Dr. Jane Caffrey received a three-year grant from the National Science Foundation to study hypoxia events in estuarine sediments. (\$450,405).

Dr. Carl Mohrherr, in collaboration with Mr. Paul Williford of the UWF library, constructed an electronic bibliography of environmental studies in Northwest Florida – a searchable database made available to the public at: <http://fusionmx.lib.uwf.edu/perch/index.cfm>

Dr. K.R. Rao directed the establishment of PERCH (Partnership for Environmental Research and Community Health), and secured funding through the Environmental Protection Agency and the Centers for Disease Control for environmental health studies in Escambia and Santa Rosa Counties. (Total support: \$2,651,307).

Ms. T.L. Streeter, Office Manager, as the lone staff member in the office is doing an admirable job in coping with the workload created by the increasing number of grants and personnel, as well as added responsibilities related to purchasing, accounting, payroll, and external/internal communications.

Ms. Jan Macauley is doing an excellent job in managing the operations of the WRL, providing oversight for quality assurance and quality control in compliance with NELAC accreditation standards, and establishing productive working relationships with regional organizations.