

ANNUAL REPORT
CENTER FOR ENVIRONMENTAL DIAGNOSTICS
AND
BIOREMEDIATION

July 1, 2005 through June 30, 2006

Prepared by

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The University of West Florida
August 19, 2006

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.

PART I-SP. Goals/Objectives for 2004-2005

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 courses 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*, *Biological Oceanography*, 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 23 Directed Studies for undergraduate and graduate students and thesis research for 18 graduate students. Collectively, CEDB faculty generated 639 undergraduate credit hours and 108 graduate credit hours in 2004-2005. 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 2004-2005 CEDB provided financial support and research opportunities for 18 graduate students and 32 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 75% 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 seven 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 will include 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), and National Oceanic and Atmospheric Administration (NOAA). External support for single-year and multi-year projects in force during 2004-2005 in the CEDB amounted to \$6,500,000, including \$800,000 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 Departments, 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: 32 undergraduate students, 18 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: 9 publications in peer-reviewed journals and proceedings; and 23 presentations and invited seminars. Nearly 75% 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 2004-2005 are listed below.

Current Projects

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 - 9/14/05	\$ 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 - 11/20/05	\$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	\$ 515,870

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 , 9/29/02 - 9/29/04	\$ 832,233
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
Phytopathogens as Bioterrorism Agents 2004, (PI: <i>J. Lepo</i>), University of South Florida (US Army) , 11/1/03 - 10/30/04	\$ 305,532
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 – 2/28/07	\$ 450,405
U. S. – France Cooperative Research: Effect of Nutrient Limitation 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 For Garcon Point Water Management Area, (PI: <i>R. Snyder</i>), Northwest Florida Water Management District , 5/1/04 – 4/30/05	\$ 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

Healthy Beaches Sampling for Okaloosa County, (PI: <i>J. Lepo</i>), Florida Department of Health, Okaloosa County Health Department , 7/1/03 - 6/30/04	\$ 19,652
Post Hurricane Opal Assessment GUIs, (PI: <i>R. Snyder</i>), National Park Service , 07/28/04 – 07/01/06	\$ 9,962
Early Detection and Diagnosis of Phytopathogens as Bioterrorism Agents, (PI: <i>J. Lepo</i>), University of South Florida (US Army) , 10/1/04 - 06/30/06	\$ 273,522

Publications and Presentations

Publications

- Chapin, T.P., J.M. Caffrey, H.W. Jannasch, L. Coletti, J.C. Haskins and K. Johnson. 2004. Nitrate sources and sinks in Elkhorn Slough, CA: results from continuous in situ nitrate analyzers. *Estuaries* 27:882-894
- Caffrey, J.M. 2004 Factors controlling net ecosystem metabolism in U.S. estuaries. *Estuaries* 27: 90-101
- Lepo, J. E. and J. M. Henson. 2004. *Crop Bioterrorism: Risk, Diagnosis, Control, Prevention, the Future*. Invited Review Chapter *In* Emerging Concepts in Plant Health Management. ISBN: 81-7736-227-5; Robert T. Lartey and Anthony J. Caesar, Eds.; Chapter 1, pp.1 - 15.
- 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.
- 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. *Appl. Environ. Microbiol.* 70:6834-6845.
- Liu, J., W.-J. Yang, X.-J. Zhu, N.K. Karouna-Renier, and K. R. Rao, 2004. Molecular cloning and expression of two HSP70 genes in the prawn, *Macrobrachium rosenbergii*. *Cell Stress and Chaperones*. 9(3): 313-323.
- Murrell, M.C. and J.M. Caffrey. 2005. High cyanobacterial abundance in three Gulf of Mexico estuaries. *Gulf and Caribbean Research*. 17:95-106.
- Snyder, R.A., 2005. An Evaluation of Restoration strategies for wet prairie habitat on garcon Point, Santa Rosa, FL, NFWFMD. Year 5 report.

Snyder R.A. 2005. *Analysis of Fecal Loadings Into Bayous Grande, Chico, and Texar, Pensacola Bay System, FL*. Prepared for: Florida Department of Health, Escambia County Health Department.

Arnosti, C., S. Durkin, and W.H. Jeffrey. 2005. Patterns of extracellular enzyme activities among pelagic microbial communities: Implications for cycling of dissolved organic carbon. *Aquatic Microbial Ecology* 38: 135-145.

R. A. Snyder, M. A. Lewis, A. Nocker, J. E. Lepo. 2005. Microbial Biofilms as Integrative Sensors of Environmental Quality. Proceedings of Symposium on Estuarine Indicators, Sanibel, Florida; S. A. Bortone, Ed. pp. 111 – 126. (CRC Press LLC)

Presentations and Invited Seminars

K. Smith, F. Aftanas, and J. M. Caffrey. Factors Controlling Nitrification In Deep And Shallow Sites In Pensacola Bay During The Summer 2004. March 2005. Gulf Estuarine Research Society and Society of Wetland Scientists. Pensacola Beach, FL

J. M. Caffrey, J. Hagy, J. Cherry, J. Campbell, and M. Murrell. The Role of Nitrification in the Nitrogen Budget of Pensacola Bay. June 2004. American Society of Limnology and Oceanography. Savannah, GA

Mohrherr, C.J., J. Liebens, J. E. Lepo, and K. Rao. 2004. Profiles of pollutants impacting Bayou Texar, Pensacola, FL. Annual Meeting of the Society for Environmental Toxicology and Chemistry (SETAC) Fourth SETAC World Congress 14- 18 November 2004; Portland, Oregon. Abstract no.MOH-1085-693999

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. Proceedings of Fourth SETAC World Congress and 25th Annual Meeting in North America. Abstract #PW275; p. 411.

Nocker, A., J. E. Lepo, L. L. Martin, J. Moss, A. D. Launder, and 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.

Moss J., A. Nocker, J. E. Lepo, and R. A. Snyder. 2004. Temporal dynamics of estuarine microbial biofilms. *International Symposium for Microbial Ecology triennial meeting, Cancun, Mexico, August 2004*

L.M. Proctor, M.T. Peglar, A. Nocker, J. E. Lepo, and R.A. Snyder. 2004. Investigating the use of microbial biofilms as indicators of estuarine status: baseline data on n cycling microbial guilds in an unimpacted estuary. *International Symposium for Microbial Ecology triennial meeting, Cancun, Mexico, August 2004*

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.

Arnosti, C., S. Ghobrial, and W.H. Jeffrey. 2005. Spatial patterns in the activities of microbial extracellular enzymes: A Factor in their persistence of “semi-labile” DOC? American Society for Limnology and Oceanography Meeting, Salt Lake City. Feb. 20 – 25.

Abboudi, M., R. Sempere, F. Joux, B. Charriere, D. Levevre, M Tedetti, M. Pujo-Pay, and W.H. Jeffrey. 2005. Impact du rayonnement ultraviolet sur le recyclage de la matiere organique par les bacteries marines. Colloque d'Ecologie Microbienne, Obernai, France. May 9-12.

Aftanas, F., K. Smith and J.M. Caffrey. Nitrification And Biogeochemical Cycling In Tidal Creeks On Sapelo Island, Ga. March 2005. Gulf Estuarine Research Society and Society of Wetland Scientists. Pensacola Beach, FL

- Wagner, M. Snyder, R. & Lepo, J. 2005. Biofilms and Water Quality An Integrated Approach to Evaluate the Condition of Estuarine Ecosystems. Gulf Chapter Estuarine Research Society meeting, Pensacola Beach, FL. May 2005.
- Moss J., Nocker A., Lepo J., Snyder R.A. 2005. Alternating Stable States within Nascent Estuarine Microbial Biofilm Community Structure Gulf Chapter Estuarine Research Society meeting, Pensacola Beach, FL. May 2005.
- Snyder, R.A., J.E. Lepo, J. Liebens, C. Briscoe. 2005. Agricultural Runoff, TMDLs and Water Quality: Field and Watershed Scale Studies, Science-Teacher Education, Agricultural Extension Activities. USDA-CSREES National Water Quality Conference, La Jolla, CA, Feb 2005.
- Jeffrey, W.H. 2004. Photographer Frank Hurley and The Endurance Expedition to Antarctica: Extreme Photography and Historical Documentation. Pensacola Junior College, Pensacola, FL. September 9.
- Jeffrey, W.H. 2005. Ozone depletion, ultraviolet radiation, icebergs, whales, penguins, and bacteria: This must be Antarctica. University of West Florida, April 1.
- Jeffrey, W.H., A.J. Baldwin, J.A. Moss, J.D. Pakulski, F. Joux. 2005. Microbial Diversity in a Pacific Ocean transect from the Arctic to Antarctic Circles. American Society for Limnology and Oceanography Meeting, Santiago de Compostela, Spain, June 19 – 24.
- Joux, F., P. Conan, F. Lantoine, I. Obernosterer, W.H. Jeffrey, and M. Abboudi. 2005. Depth distributions of solar UV radiation effects on bacterioplankton and phytoplankton in NW Mediterranean coastal water during summer. American Society for Limnology and Oceanography Meeting, Santiago de Compostela, Spain, June 19 – 24.
- Neale, P.J., W.H. Jeffrey, C. Sobrino, L.A. Franklin, and J. Phillips-Kress. 2005. UV Inhibition of phytoplankton photosynthesis during the late stage of an extensive Ross Sea polynya bloom. American Society for Limnology and Oceanography Meeting, Santiago de Compostela, Spain, June 19 – 24.

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, two post-doctoral

research associates have been recruited to join the Center in 2004-2005. Search will be conducted to recruit additional post-doctoral associates in 2005-2006.

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 15 different committees (e.g., Presidential Faculty Advisory Committee, University Health and Safety Committee; University Employee Benefits Committee; Search Committee for Associate Vice President for Research and Dean of Graduate Studies; 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 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; Dr. Jane Caffrey, Member, National Water Quality Council), and service as reviewers of journal articles and research proposals. Collectively CEDB faculty reviewed more than 25 articles for 11 different journals, and also provided assistance through service on editorial boards (e.g., Dr. R.A. Snyder, *Journal of Eukaryotic Microbiology*; Dr. J. E. Lepo, *Journal of Applied Microbiology*; Dr. W. H. Jeffrey, Associate Editor, *Limnology and Oceanography*). CEDB faculty served on peer-review panels for: NSF Biological Oceanography Program; NSF Ocean Sciences; NSF Office of Polar Programs 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, Maryland, Georgia, Connecticut/New York, and Texas), Indo-U.S. Technology Forum, 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 14 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.
- Dr. J. M. Caffrey, Member, Science Advisory Committee for Georgia Coastal Ecosystem Long Term Ecological Research (LTER)

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 continue a major research program aimed at addressing concerns on environmental pollution and public health outcomes in Northwest Florida.

Additionally, CEDB assisted the Escambia, Okaloosa, and Santa Rosa 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 Commission, 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 2004-2005 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
Discovery Day Presentations at Oriole Beach Elementary School
E-mail correspondence from Antarctica with classrooms in Florida and Virginia

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.

PART II-A. Major accomplishments and changes in programs and services for 2004-2005

A. External funding received by the CEDB for new and continuing multi-year projects in 2004-2005 amounted to \$800,000 which included funding derived through peer-reviewed, national level competitive grants from NSF and EPA, as well as continuing support from the U.S. Army through a consortium led by USF.

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 Georgia Institute of Technology and Florida State University.

C. The CEDB maintained strong partnerships (through 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), 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 new equipment (e.g., Quikchem 8500 Series nutrient analyzer) purchased for improved infrastructure for effective operations.

F. Personnel changes. Dr. Hugo Castillo and Dr. Sang Hyon Lee joined as post-doctoral Research Associates. Ms. Juanita Johns joined the Center as an OPS Office Assistant.

PART II-B. Distinguished Individual Accomplishments

Dr. W.H. Jeffrey participated in US-France collaborative research supported by the National Science Foundation. He served as Associate Editor, *Limnology and Oceanography*.

Drs. J.E. Lepo and **R.A. Snyder** succeeded in obtaining continuing support for microbial biofilms research from the Environmental Protection Agency (Total support: \$459,899).

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 strengthening productive working relationships with collaborators at USF. (\$273,522).

Dr. Jane Caffrey joined the PERCH project research team, and is directing a project on atmospheric deposition of mercury to the Pensacola Bay System. She has been appointed as a member of the National Water Quality Council, and as a member of the Science Advisory Committee, Georgia Coastal Reserves LTER.

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 PERCH (Partnership for Environmental Research and Community Health) Program, 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).

Dr. Natalie Karouna-Renier joined the PERCH project research team and assumed a leadership role in directing the studies on contaminant accumulation in fish and shellfish.

Ms. T.L. Streeter, Office Administrator, as the lone USPS 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.

Ms. Juanita Johns, OPS Grants Specialist, is doing a wonderful job taking on multiple grant related tasks including purchasing, payroll, travel, and external/internal communications. She has become a valuable asset to the Center.

PART III-A. Goals/Objectives for 2005-2006

- A. Provide instructional support to the affiliated academic department(s).
- B. Maintain a strong externally-funded research program involving individual and collaborative projects, with research participation opportunities for students and other trainees.
- C. Engage in service activities pertinent to the institution, community, and profession.
- D. Address critical needs relevant to the diagnosis and improvement of environmental health in Northwest Florida.
- E. Identify and pursue additional sources of funding for research and student training, including federal appropriations for additional projects.
- F. Develop a transition plan for leadership change in relation to the impending retirement of the Director of CEDB.
- G. Examine the historical performance outcomes of CEDB and propose targets for short-term and long-term success.

PART III-B. Priorities/Goals for 2006-2010

- 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. Recruit a new Director for CEDB, effective September 2007.
- E. Strengthen collaboration among the various academic units within the university to foster interdisciplinary programs in environmental/community health studies in the region.
- F. Strengthen interinstitutional partnerships to foster interdisciplinary research programs of national priority.
- G. Maintain a productive research program.
- H. Augment and supplement the course offerings and program support in the affiliated academic department(s).
- I. Maintain a strong record of service to the institution, profession, and community.

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: \$156,000 for salaries and benefits; 2.0 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 (2006-2008).