

P. V. SUNDARESHWAR, PhD.

Institute of Atmospheric Sciences
South Dakota School of Mines and Technology
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EDUCATION

PhD. 2000 University of South Carolina, Columbia SC; Biology; Thesis – Phosphorus Dynamics in impacted and non-impacted wetlands of South Carolina: Understanding Linkages between Natural Processes and Anthropogenic Perturbations.

M.S. 1990 University of Bombay, Bombay, India

B.S. 1988 University of Bombay, Bombay, India

PROFESSIONAL EXPERIENCE

2009 – Present Associate Professor, Institute of Atmospheric Sciences, South Dakota School of Mines and Technology

2005 – Present State Carbon Scientist

2004 – Present Director of Biogeochemistry Core Facility

2004 – Present Technical Advisor, Government of India for the INDOFLUX Program

2006 – 2010 Program Chair, Atmosphere and Environmental Sciences (AES) PhD program

2003 – 2008 Assistant Professor, Institute of Atmospheric Sciences, South Dakota School of Mines and Technology.

2000 – 2003 Principal Investigator and Research Associate, Duke University Wetland Center.

1993 – 2000 Instructor and National Oceanic and Atmospheric Administration (NOAA)/National Estuarine Research Reserve (NERR) Graduate Research Fellow, University of South Carolina, Columbia, SC

1992 – 1993 Research Fellow, Eco-development and Eco-restoration Project for the Tata Electric company (TEC) hydroelectric dams, Maharashtra, India. Private Consultant, Pune, India – Impact assessment and conflict resolution.

1991 – 1992 Research Fellow, The State and the Changing Face of Forests in India with Special Reference to the Paper and Pulp Industry. Indo-Dutch Project for Alternatives in Development, Mumbai, India.

1990 – 1991 Research Fellow, Protected Areas and Wildlife Conservation in Maharashtra. World Bank Forestry Sector Project, Pune, India – Guidelines for an Integrated Protected Areas System (IPAS).

PROFESSIONAL CONSULTING

10/06 – 11/06 AgCert International Plc.

2005 – 2007 C-Lock Technologies Inc. – A wholly owned subsidiary of Evergreen Energy Inc.

OCEAN RESEARCH CRUISE EXPERIENCE

May 31st – June 9th 2008. Bay of Bengal, Indian Ocean aboard Ocean Research Vessel Sagar Nidhi.

PATENTABLE DISCLOSURE

3 Patentable ideas have been disclosed to the South Dakota School of Mines and Technology and are currently under patent application process.

FELLOWSHIPS, AWARDS AND HONORS

2010 *Congressional National Medal*. Senate. Republic of Chile.

2010 *Member – Organizer*. Workshop: Our Rivers in Danger. Puerto Varas, Chile. September 23-24.

2010 *Member*, National Coal Council Study Group. – Charged by Dr. Steven Chu, Secretary, US Department of Energy.

2010 *Plenary Lecture*. Wetlands and Global Change. International Conference on Advances in Materials and Techniques in Civil Engineering. January 07, 2010. Coimbatore, India.

2009 *Member*, NOAA Delegation headed by Dr. Richard Spinrad (Assistant Administrator NOAA) for the Joint Executive Meeting between NOAA and The Ministry of Earth Sciences, Government of India. New Delhi. October 7-9.

2009 Carhart Lectures in Natural Science. Dakota Wesleyan University. 17th February. Mitchell, SD.

2008 *Plenary Lecture* on wetlands and global change for the annual international symposium of the Melton Foundation. Dillard University, New Orleans. 3rd October

2007 “*Revolutionary Mind for 2007*” - One of eight scientists from around the world named as a “*Revolutionary Mind for 2007*” by *Seed* magazine of the Seed Media Group, NY. The following PDF contains the section from the October issue explaining the series and my profile. <http://www.ias.sdsmt.edu/staff/Sundareshwar/SeedMag-PV.pdf>

- 2007 *Panel Member*, Carbon, climate change and economic opportunities. SD Not-Till Farmers Association, Huron, SD
- 2006 *Principal Organizer*, Indo-US Workshop on INDOFLUX. Chennai, India. July 2006.
- 2006 *Keynote speaker* Workshop on Natural resources, the State of Chhattisgarh, India
- 2005 South Dakota Space Grant. Research infrastructure improvement award.
- 2005 SDSM&T Budget advisory committee award.
- 2004 *Principal Organizer*, Symposium titled “In the Footsteps of Lewis and Clark – Rediscovering Earth from land to the sea – A Biogeoscience Perspective”. Themed symposium of the 89th Ecological Society of America Meeting, August 2 – 6, 2004. Portland, Oregon.
- 2003 Research Career Award, SDSM&T and the SD EPSCoR.
- 2003 Nelson Research Initiative Award, SDSM&T.
- 2003 Visiting Scientist Award, Baruch Marine Field Laboratory, University of South Carolina, Georgetown, SC
- 2001 *Moderator*, Session on Coastal Systems, Seventh Symposium on Biogeochemistry of Wetlands, June 17 – 20 2001, Duke University.
- 1999 Outstanding Student Poster Award, International Aquatic Sciences meeting of the American Society of Limnology and Oceanography, Santa Fe.
- 1999 Environmental Protection Agency (EPA) / Experimental Program to Stimulate Competitive Research (EPSCoR) Environmental Science Fellowship, - for outstanding research in environmental science and fostering environmental awareness in general public
- 1999 Baruch Institute Travel Award
- 1999 Graduate School Travel Award
- 1998 Graduate School Award, College of Science and Mathematics, Graduate Student Day
- 1998 National Oceanic and Atmospheric Administration (NOAA)/National Estuarine Research Reserve (NERR) Graduate Research Fellowship
- 1998 W. Gordon Belser Fellowship in Botany
- 1997 W. Gordon Belser Fellowship in Botany

RESEARCH GRANTS [Current grants: PI - \$841,000, planned: \$277,245]

- Collaborative Research: Paradox of a diatom: Blooms in oligotrophic waters. NSF Ecosystem studies program. 09/2011 – 08/2014. PI. \$505,375 (SDSM&T component: \$277,245) – Planned.
- Role of Iron in regulating *Didymosphenia geminata* blooms in Kootenai River. USACE (approved). Additional funding of \$75000, PI.

- Role of Iron in regulating *Didymosphenia geminata* blooms in Kootenai River. United States Army Corps of Engineers. 10/01/2010-09/30/2011. PI. \$100,000 (SDSM&T component: \$75,000)
- Ecosystem condition assessment of playa wetlands. Oklahoma State University. 04/2009 – 12/2010. PI. \$10,000
- Phosphorous speciation as an indicator of landuse and conservation practices on wetland condition. United States Department of Agriculture's Natural Resource Conservation Service (Collaborator USGS – Northern Prairie Wildlife Research Center). PI. 10/01/2009 – 09/30/2012. \$140,000.
- Phosphorus speciation as an indicator of wetland condition assessment. Northern Prairie Wildlife Research Center – USGS. PI. 10/01/2009 – 09/30/2010. \$40,000.
- Collaborative Research: Exploration of the mechanistic basis and biogeochemical implications of differential nutrient limitation among trophic levels. National Science Foundation Ecosystem Studies, collaborative with Duke University and University of Southern Carolina. 9/2008 – 8/2011. Awarded. PI. \$934,000. (SDSM&T component: \$324,000)
- A proposal to increase minority participation in higher education in stem disciplines responsive to NASA needs – a multi-institution effort. NASA's National Space Grant College and Fellowship Program. Consortium Development Competition. 05/2008 – 04/2010. No-cost extension till 05/31/2011. Co-PI. Total funding: \$177,000
- Phase I: Data Collection and Assessment for Mercury TMDL Development, US Environmental Protection Agency and the South Dakota Department of Environment and Natural Resources, Regional 8 319 Program, 1/2008 – 1/2010. Co-PI. Total: \$238,742
- Phosphorus forms in prairie pothole wetlands: a ³¹P NMR study. U.S. Geological Survey. 9/2007-8/2008. PI. \$13,750.
- SGER: An opportunity to study the impact of nutrient pulsing in an oligotrophic forest stream in South Dakota. National Science Foundation. 8/2007 – 2/2009. PI. \$75,000.
- Effect of Water, Nitrogen, Carbon, and Phosphorous on Bacterial Communities on Pine Needle Litter. Black Hills State University faculty development grant. Co-PI. \$2700.
- Establishing a long-term biogeochemical monitoring network in India to study climate change. Programmatic grant. Funds earmarked in India's 11th Five Year Plan through the Department of Science and Technology, Government of India. (2007-2012). Lead. \$50 Million.
- Indo-US Bilateral Workshop on INDOFLUX. Chennai, India. Indo-US Science and Technology Forum. July 2006. \$131,171
- Establishing the Great Plains Center for Atmosphere and Human Health. The Center is a collaborative effort between the Institute of Atmospheric Sciences at SDSM&T, the Black Hills Center for American Indian Health - a premier epidemiological research center, the

Black Hills State University, and the Western Research Alliance. NOAA earmark. \$1 Million (SDSMT component, \$275,000).

- Enhancing Indo-US collaborations to establish a biogeochemical monitoring network for studying global environmental change. Indo-US Science and Technology Forum. PI. \$5000
- Acquisition of equipment cluster to strengthen a multi-disciplinary regional Biogeochemistry Core Facility for research and training. National Science Foundation. PI. 269,875.
- Acquisition of laboratory and field instrumentation to enhance research and education. SDSM&T Budget Advisory Committee. PI (Co-PI. Dr. James Stone). \$16,870.
- Composition of communities of methane-oxidizing bacteria in soils of Ponderosa Pine forests and their response to wildfires. Co-PI. (PI. Dr. David Bergman, Black Hills State University [BHSU]). BHSU Faculty Research Committee. 09/01/2004. \$2,700.
- Establishing a Biogeochemistry Core Facility. South Dakota NSF- EPSCoR Career Research Award. PI. 2003-2004. \$67,000.
- Research Initiative Award. South Dakota School of Mine and Technology. PI. 2003-2004. \$5,000.
- Characterization of phosphorus removal metabolisms in wastewater treatment, sediment, and dental environments: an interdisciplinary approach. Center for Environmental Solutions - Small Grants Program. PIs: Drs. A. J. Schuler and P. V. Sundareshwar. 04/19/2002. \$9,908.
- Understanding the Biocomplexity of Differential Nutrient Limitations between Trophic Levels: A Comparison among Biomes. National Science Foundation's Biocomplexity Program (CBC). Duration: 12 months (effective date 09/15/01). PI: Dr. C. J. Richardson; Co-PIs: Drs. P. V. Sundareshwar, J. T. Morris, J. E. Hobbie, and A. E. Giblin; Senior Personnel: Dr. D. D. Richter. \$93,854.
- Role of sediment processes in regulating water quality of the Cape Fear River. United States Geological Survey (USGS). Administered by Water Resources Research Institute (WRI) 2001 – 2002. PIs: Drs. P. V. Sundareshwar and C. J. Richardson. \$61,561.
- Phosphorus dynamics in impacted and non-impacted coastal wetlands of South Carolina: Are there linkages between natural Processes and Anthropogenic influences. National Oceanic and Atmospheric Administration (NOAA) – OCRM under the National Estuarine Research Reserve (NERR) Graduate Research Fellowship program, 1998 – 2001. PI: P. V. Sundareshwar, Co-PI: J. T. Morris. \$46,000.

PUBLICATIONS

- Sundareshwar, P.V.**, S. Upadhyay, M. Abessa, S. Honomichl, B. Berdanier, S. Spaulding, C. Sandvik, and A. Trennepohl. 2010. The paradox of algal blooms in oligotrophic waters. *GRL*, submitted.
- Sundareshwar, P. V.**, C.J. Richardson, S. C. Neubauer, J. T. Morris, and E. Koepfler. 2010. Differential nutrient limitation: Developing a theoretical framework for an emerging ecological phenomenon. *Bioscience*. In preparation.

- Oliver J, B. Harper, R. Narula, I. Bhattacharya, Richard Winschel, G. Hill, S. Tucker, W. Olson, A. Knight, L. Gabriel, and **P. V. Sundareshwar**. 2011. Chapter 3. Expediting the Deployment of CO₂ Transport, Storage & Reuse. In: *2011 National Coal Council Report*. In revision
- Krutka, H., et al. 2011. Chapter 2: Expediting the Expediting the Deployment of Carbon Capture & Low Carbon Coal Technologies. In: *2011 National Coal Council Report*. In revision.
- Sundareshwar, P. V.** 2010. Wetlands and Global Change. *Proceedings of the International Conference on Advances in Materials and Techniques in Civil Engineering*. VLBJCET, Coimbatore. pg.125 – 130.
- Sundareshwar, P. V.**, C. J. Richardson, R. Gleason, P. Pellechia and S. Honomichl. 2009 Nature versus Nurture: Functional assessment of wetland restoration efforts. *Geophysical Research Letters*, **36**, L03402, doi:10.1029/2008GL036385.
- C. J. Richardson, J. W. Pahl, J. Vymazal, P. Vaithyanathan, R. G. Qualls, **P.V. Sundareshwar** and L. Barber. 2008. Enrichment Gradients in WCA-2A and Northern WCA-3A: Water, Soil, Plant Biomass and Nutrient Storage Responses. In: **The Everglades Experiments: Lessons for Ecosystem Restoration**. C. Richardson (Ed.). *Ecological Studies*. Springer, 727p.
- Sundareshwar, P. V.**, R. Murtugudde, G. Srinivasan, S. Singh, K. J. Ramesh, R. Ramesh, S. B. Verma, D. Agarwal, D. Baldocchi, C. K. Baru, K. K. Baruah, G. R. Chowdhury, V. K. Dadhwal, C. B. S. Dutt, J. Fuentes, Prabhat K. Gupta, W. W. Hargrove, M. Howard, C. S. Jha, S. Lal, W. K. Michener, A. P. Mitra, J. T. Morris, R. R. Myneni, M. Naja, R. Nemani, R. Purvaja, S. Raha, S. K. Santhana Vanan, M. Sharma, A. Subramaniam, R. Sukumar, R. R. Twilley, P. R. Zimmerman. 2007. Environment: Environmental Monitoring Network for India. *Science*. **316**, 204-205.
- Sundareshwar P. V.**, J. T. Morris, E. K. Koepfler, and B. Fornwalt. 2003. Phosphorus limitation of coastal ecosystem processes. *Science*. **299**:563-565
- Morris J. T., **P. V. Sundareshwar**, C. T. Nietch, B. J. Kjerfve, D. R. Cahoon. 2002. Response of coastal wetlands to rising sea level. *Ecology*. **83**(10): 2869-2877.
- Sundareshwar, P. V.** and C. J. Richardson. 2002. Role of sediments in regulating water quality in the Cape Fear River Basin, North Carolina. *Water Resources Research Institute*, North Carolina State University. USGS.
- Sundareshwar, P. V.** and C. J. Richardson. 2001. Present and Historical Water Quality on The Cape Fear River: Effects of Lock And Dam Structures. *North Carolina Water Resources Research Institute*, North Carolina State University.
- Sundareshwar, P. V.** 2001. Decomposers: *Their role in ecosystem functioning*. In: Characterization of the Ashepoo-Combahee-Edisto (ACE) Basin, South Carolina. A peer-reviewed CD-ROM publication of the NOAA Coastal Service Center.
- Sundareshwar, P. V.**, Morris J. T., Pellechia P. J., Cohen H., Porter D. E. and Jones B. C. 2001. Occurrence and ecological significance of pyrophosphate in estuaries. *Limnology and Oceanography* Vol.**46** (6) 1570-1577.

Sundareshwar, P. V. and Morris, J. T. 1999. Phosphorus Sorption Characteristics of Intertidal Marsh Sediments along an Estuarine Salinity Gradient. *Limnology and Oceanography* Vol.44 (7) 1693-1701.

Sundareshwar, P. V. 1989. A short-term study of the time budget of *Ratufa indica*. Study conducted during the Vertebrate Ecology Workshop and the report submitted to the Bombay Natural History Society.

Publications in Preparation:

S. Upadhayay, **P. V. Sundareshwar**, M. Abessa. Response of *Didymosphenia geminata* to nutrient dosing in an oligotrophic forest stream.

S. Updahayay and **P. V. Sundareshwar**. Aluminum and Iron uptake by *Didymosphenia geminata*.

Sundareshwar, P. V., D. Bergmann, S. Honomichl. Effect of nutrients on respiration rates from soil and litter of Pine forests in the Black Hills, South Dakota.

Bergmann, D., and **Sundareshwar, P. V.** Influence of nutrient amendments on the bacterial diversity of soil and litter from a Pine forest in the Black Hills, South Dakota.

Sundareshwar P. V. and C. J. Richardson. Phosphorus dynamics in the Middle Cape Fear River basin. To be submitted to *Environmental Science and Technology*.

MEDIA COVERAGE OF RESEARCH ACTIVITIES AND POPULAR ARTICLES:

- Waterway's study has local, global impact. Rapid City Journal. Lifestyles. Section D. Education. Wednesday, December 1, 2010, D1-D2. Access online story "Mines' professor's studies of waterways have local, global impact" at http://www.rapidcityjournal.com/lifestyles/article_1f29f774-fcdb-11df-ad18-001cc4c002e0.html
- Sundareshwar Awarded Chile's Highest Civilian Honor. <http://news.sdsmt.edu/stories/110482/>
- Professor leads Environmental Camp in India. <http://news.sdsmt.edu/stories/9196/>
- Professor Named "Revolutionary Mind". <http://news.sdsmt.edu/press/6508/>
- The footprints of warming. Interview published in a leading national daily in India –The Hindustan Times on May 04, 2007. http://www.ias.sdsmt.edu/staff/Sundareshwar/Media_Coverage/04_05_2007_011_010.jpg
- India set to Check Environmental Pulse. News @ Nature. April 12, 2007 <http://www.nature.com/news/2007/070409/full/070409-12.html>. Numerous media articles on this have also been published online.
- Neglected forms of phosphorus play important role. 2004. Online News – The Latest on the Environment. News of the Week. *Environmental Science & Technology*. September 8. http://pubs.acs.org/subscribe/journals/esthag-w/2004/sep/science/jp_phosphorous.html.

[Article on the research presented at the 89th ESA meeting, Portland, Oregon, August 2 – 6 2004.]

- Control of Coastal Ecosystems: or Denitrification Demystified. April 2003. *Environmental Review*. **10** (4): 8-16.
<http://environmentalreview.org/archives/vol10/SudareshwarAbstract.html>
- “Study Says Wetlands Management Requires Integrated Approach”. March 2003. *Forestry Source*. A publication of the Society of American Foresters.
<http://www.safnet.org/periodicals/forestrysource/highlights03.cfm>
- Bacterial growth limited by phosphorus. February 27, 2003. *Environmental Science & Technology, Science New*. Access at http://pubs.acs.org/subscribe/journals/esthag-w/2003/feb/science/an_phosphorus.html
- New study highlights need to control both excessive nitrogen & phosphorus for healthy water ecosystems.
- Study finds controlling phosphorus pollution in wetlands more important than believed. *Duke News and Communications*. News release, Published on January 24, 2003.
<http://www.sciencedaily.com/releases/2003/01/030128075641.htm>
- Linking historical changes in landuse and nutrient dynamics behind three lock and dam on the Cape Fear River in North Carolina. 2000. *Wetland Wire*. **3**(3): 5.

Presentations and Conference Proceedings:

- 2011 *Invited*, **Sundareshwar, P. V.**, C. Richardson, S. Nuebauer, J. Morris, E. Koepfler, M. Abessa and S. Gautam. Differential nutrient limitation: Developing a theoretical framework for an emerging ecological phenomenon. ASLO. February 13-18. San Juan, Puerto Rico.
- 2010 **Sundareshwar, P. V.**, S. Upadhayay, M. Abessa, S. Honomichl, B. Berdanier, S. Spaulding, C. Sandvik, and A. Trennepohl. Paradox of algal blooms in oligotrophic waters. AGU Fall meeting. December 13 -18. San Francisco, CA.
- 2010 Mebratu Abessa, **Sundareshwar, P. V.** and S. Upadhayay. Physical processes affecting the distribution of *Didymosphenia geminata* blooms in Rapid Creek. Geological Society of America. November 1 -2. Denver. CO.
- 2010 *Invited*, **Sundareshwar, P. V.** What Next? Setting up a rapid response to stem the spread of *Didymosphenia geminata* across Chile. September 23-24, Puerto Varas, Chile.
- 2010 S. Spaulding and **Sundareshwar P. V.** Watershed influence on *Didymosphenia geminata* and stalk biomass – the central role of Iron. International Diatom Symposium. August 29 – September 3, MN.
- 2010 **Sundareshwar, P. V.** and S. Spaulding. Role of Iron in *Didymosphenia geminata* blooms. ASLO/NABS meeting. June 6-10. Santa Fe, NM,.
- 2010 S. Upadhayay, M. Abessa, and **Sundareshwar, P. V.** *Didymosphenia geminata* blooms in Rapid Creek. Western South Dakota Hydrology Conference, April 21, Rapid City, SD.

- 2010 *Plenary Lecture*. **Sundareshwar P.V.** Wetlands and Global Change. International Conference on Advances in Materials and Techniques in Civil Engineering. January 07, 2010. Coimbatore, India.
- 2009 *Invited*. **Sundareshwar P. V.** Linking INDOFLUX and NOAA initiatives in India. Joint Executive Committee meeting between NOAA and The Ministry of Earth Sciences, Government of India. New Delhi. October 7-9.
- 2009 *Invited*. **Sundareshwar P. V.** The INDOFLUX program and possible connections to the Indian Ocean Observing System. CLIVAR/ IOC GOOS Indian Ocean Panel 6th Session. La Reunion. France. June 3rd- 5th
- 2009 *Invited*. **Sundareshwar P. V.** Implementing the INDOFLUX initiative. Indian Institute of Tropic Meteorology (IITM), Pune India. 13th March.
- 2009 *Invited*. **Sundareshwar P. V.** Carbon Credits Trading. Lunch-N-Learn public seminar. SDSM&T, Rapid City, SD 5th March.
- 2009 *Invited*. **Sundareshwar P. V.** Effects of Global Warming. Carhart Lectures in Natural Science. Dakota Wesleyan University. 17th February. Mitchell, SD.
- 2008 **Sundareshwar P. V.** and B. W. Berdanier. Response of *Didymosphenia geminata* to Nutrient Dosing in an Oligotrophic Stream. AWRA 2008 Annual Water Resources Conference. New Orleans, Louisiana, November 17-20, 2008
- 2008 *Plenary Lecture* **Sundareshwar, P. V.** Wetlands and Global Environmental Change. The Melton Foundation Symposium. Dillard University, New Orleans, 3rd October
- 2008 Kyle Maurer, Bruce W. Berdanier, **Sundareshwar P.V.**. Investigation of Phosphorus Uptake Capability in the Diatom, *Didymosphenia geminata*. American Society for Engineering Education NCS Conference, Dayton, OH, March 28 - 29, 2008. Awarded 3rd Place Best Student Paper.
- 2008 Development of a mercury TMDL for South Dakota lakes and reservoirs – James Stone, Larry Stetler, **Sundareshwar P. V.**, South Dakota School of Mines and Technology, Steve Chipps, , Michael Penn. Western South Dakota Hydrology Conference, Rapid City, SD. April 2008.
- 2007 *Invited* for Showcase of select Conservation Innovation Grants awarded by USDA – Natural resource Conservation Service (NRCS). K. Updegraff, P. Zimmerman, P. Kozak, and **Sundareshwar, P. V.** C-Lock Pilot Project to Quantify and Market CO₂ Emission Offsets from Farmlands. Soil and Water Conservation Society. 2007 Annual Conference. July 21 – 25. Tampa, FL. Also won an Honorable Mention – Best Poster Award.
- 2007 *Invited*. **Sundareshwar P. V.**, Global Environmental Change – Facts and Myths. National American University. Rapid City South Dakota.
- 2007 Karen Updegraff, Patrick Zimmerman, Patrick Kozak, and **Sundareshwar P.V.**. Farm-Specific Modeling can Provide Better Value to Soil-based GHG Offset Buyers and Sellers. The Fourth USDA Greenhouse Gas Conference. Baltimore, MD. February 6 -8.

- 2007 *Invited. Sundareshwar P. V.*, P. Zimmerman, K. Updegraff, and P. Kozak. Soil Carbon sequestration and climate change – opportunities for rural communities. South Dakota Agricultural and Rural leadership Program. Rapid City, SD
- 2007 *Invited. Sundareshwar P. V.*, P. Zimmerman, K. Updegraff, and P. Kozak. Soil Carbon sequestration to mitigate climate change and earn money. South Dakota No-Till Farmers Association. Huron, SD.
- 2006 *Inaugural presentation and Organizer. Sundareshwar, P. V.* Why India needs an Environmental monitoring network. Indo-US Bilateral Workshop on INDOFLUX. Chennai. July 2006.
- 2006 *Keynote address. Sundareshwar P. V.* Global Change, resource management and economic opportunities for the State of Chhattisgarh.
- 2006 *Invited. Sundareshwar, P. V.*, G. Srinivasan, and S. Singh. Establishing an INDOFLUX: A Long-Term Biogeochemical Monitoring Network in India. International Workshop on "Sustained Indian Ocean Biogeochemical and Ecological Research (SIBER)" National Institute of Oceanography, Dona-Paula, Goa-403004, India 3-6 October, 2006
- 2006 *Invited. Sundareshwar, P. V.*, Koepfler, Eric, Morris, James, Neubauer, Scott, Pinckney, James, Smith, Erik. Effect of differential nutrient limitation on carbon sequestration in a North Inlet, SC, salt marsh. ESA 91st International Meeting. Memphis, Tennessee.
- 2005 *Invited Sundareshwar P.V.*, G Srinivasan, and Shambhu Singh. Establishing a long-term Monitoring network in India to study global environmental change. 1st INDOFLUX planning workshop. Indian Institute of Tropical Meteorology, Pune.
- 2005 *Invited. Sundareshwar P. V.* Global Change and the Millennium Development Goals. Indian Young Professionals Network launch. UN Plaza, NY.
- 2005 *Invited Sundareshwar, P. V.* Establishing the INDOFLUX. At the following institutions: The Department of Science and Technology, Indian Institute of Science, National Institute of Oceanography, National Physical Laboratory, Anna University,
- 2005 *Invited. Sundareshwar, P. V.*, Phosphorus a Master Element?!. Marine Science Institute. University of Texas at Austin.
- 2005 *Invited Sundareshwar, P. V.* Establishing a long-term biogeochemical monitoring network in India. Address to the Governing Board of the Indo-US Science and Technology Forum, MIT, Ma.
- 2005 Richardson, C. J., **Sundareshwar P. V.**, W. H. Hartman, and G. H. Bruland. Chemical Speciation of Phosphorus as an Index of Alterations in Ecosystem Structure and Function. 9th International Symposium on Biogeochemistry of Wetlands. Louisiana State University, Baton Rouge, LA. March 20 – 23.
- 2005 *Invited. Sundareshwar, P. V.*, E. Koepfler, and C. J. Richardson. Role of phosphorus in assessing ecosystem response to anthropogenic perturbations and global environmental change studies. 9th International Symposium on Biogeochemistry of Wetlands. Louisiana State University, Baton Rouge, LA. March 20 – 23.

- 2005 Koepfler, E., **Sundareshwar P. V.**, E. Smith, and O. Akman. Pelagic Nutrient and Organic Matter Response to Climate Change in the North Inlet Ecosystem. ERF.
- 2005 *Invited*, **Sundareshwar, P. V.** Phosphorus limitation of coastal ecosystems. South Dakota State University. February 25.
- 2004 *Invited*, **Sundareshwar, P. V.** The Role of Traditional Ecological Knowledge / Tribal Lifeways in Coupled Natural and Human Systems. Addressing Tribal Traditional Lifeways in EPA Risk Assessment policies and procedures. National EPA-Tribal Science Council meeting, Duluth, MN, November 8- 10.
- 2004 *Invited*, **Sundareshwar, P. V.** Exploring Dynamics of Coupled Natural and Human Systems in South Dakota – 2 Case Studies. A Colloquium on Biocomplexity and Bioprocessing Research hosted by the Western Research Alliance. Rapid City, South Dakota. 17th September.
- 2004 **Sundareshwar, P. V.**, W. Hartman, G. Bruland, and C. Richardson. Phosphorus speciation as a tool for assessing anthropogenic impact and ecosystem restoration efforts. The 89th ESA meeting, Portland, Oregon, 2 – 6 August.
- 2004 Hartman, W., **P. V. Sundareshwar**, G. Bruland, R. Vilgalys, and C. J. Richardson. Linking microbial diversity and soil biogeochemistry across wetland disturbance gradients. The 89th ESA meeting, Portland, Oregon, 2 – 6 August.
- 2004 *Symposium*, **Sundareshwar P. V.** and C. J. Richardson. Phosphorus Transformations. Presentation made during the Symposium titled “In the Footsteps of Lewis and Clark – Rediscovering Earth from Land to the Sea – A Biogeoscience Perspective.” The 89th ESA meeting, Portland, Oregon, 2- 6 August. [An article on this presentation has been published in *Environmental Science & Technology* - access at http://pubs.acs.org/subscribe/journals/esthag-w/2004/sep/science/jp_phosphorous.html]
- 2004 *Symposium*, **Sundareshwar, P.V.** and J. J. Elser. In the Footsteps of Lewis and Clark – Rediscovering Earth from Land to the Sea – A Biogeoscience Perspective. The 89th ESA meeting, Portland, Oregon, 2 – 6 August
- 2004 *Invited*, Richardson, C. J. and **P. V. Sundareshwar**. Phosphorus availability and limitations in the Everglades: An Assessment of controls. The 7th INTECOL International Wetlands Conference in Utrecht, The Netherlands. 25 – 30 July
- 2004 Pahl, J. W., C. J. Richardson, and **P. V. Sundareshwar**. Fire and Physical disturbance as Mechanisms to Limit the Expansion of *Typha domingensis* in the northern Everglades. The 7th INTECOL International Wetlands Conference in Utrecht, The Netherlands. 25 – 30 July.
- 2003 Richardson, C. J. and **P. V. Sundareshwar**. Phosphorus in wetlands: an assessment of mechanisms controlling storage, availability and transport. Eighth International Symposium on Biogeochemistry of Wetlands, September 14-17, 2003. Ghent University, Ghent, Belgium.

- 2003 **Sundareshwar, P.V.** and C. J. Richardson. Role of Sediment Processes in Regulating Water Quality of the Cape Fear River. 17th Biennial Conference of the Estuarine Research Federation, Sept 14 – 18, 2003. Seattle, Washington.
- 2003 *Invited*, **Sundareshwar, P. V.** Phosphorus a Master Element?!. Black Hills State University. Fall 2003.
- 2003 **Sundareshwar P. V.**, E. T. Koepfler, J. T. Morris, B. Fornwalt, and C. J. Richardson. Phosphorus limitation of coastal ecosystem processes – biogeochemical implications of differential nutrient limitations. 88th Ecological Society of America meeting held jointly with International Society for Ecological Modeling North America Chapter. August 3 – 8, 2003. Savannah, Georgia.
- 2003 *Invited*, Morris, J. T. and **P. V. Sundareshwar**, Effect of nitrogen loading on salt marsh metabolism and sedimentation: interactions with rising sea level. 88th Ecological Society of America meeting held jointly with International Society for Ecological Modeling North America Chapter. August 3 – 8, 2003. Savannah, Georgia.
- 2003 Hartman, W. H., **P. V. Sundareshwar**, R. Vilgalys, G. L. Bruland, and C. J. Richardson. Linking microbial diversity and ecosystem functions across land use patterns. 88th Ecological Society of America meeting held jointly with International Society for Ecological Modeling North America Chapter. August 3 – 8, 2003. Savannah, Georgia.
- 2002 *Invited*, **Sundareshwar, P.V.** Role of Sediment Processes in Regulating Water Quality of the Cape Fear River. 2001 – 2002 Water Resources Research Seminar Series, Water Resources Research Institute, North Carolina State University, Raleigh, NC, May 28
- 2002 *Invited*, **Sundareshwar P. V.** Present And Historical Water Quality on The Cape Fear River: Effects of Lock And Dam Structures. North Carolina Water Resources Research Institute Annual Meeting, Raleigh, April 9
- 2001 *Invited*, **Sundareshwar, P. V.** Nutrient Dynamics in Coastal Wetlands. Duke University Marine Laboratory Seminar Series. September 20, Duke University Marine Laboratory, Beaufort, NC
- 2001 *Invited*, **Sundareshwar, P. V.** Phosphorus Dynamics in Coastal Wetlands. The Seventh International Symposium on Biogeochemistry in Wetlands. June 17-20, Duke University, Durham, NC
- 2001 **Sundareshwar, P. V.**, Morris, J. T, Koepfler, E., and Fornwalt, B. Phosphorus Control of Nitrogen Transformations in Coastal Wetlands. American Society of Limnology and Oceanography, 2001 Aquatic Sciences Meeting, February 12-16, Albuquerque, NM
- 2001 Morris J. T., **P. V. Sundareshwar**, C. T. Nietch, B. J. Kjerfve, D. R. Cahoon. Response of coastal wetlands to rising sea level. American Society of Limnology and Oceanography, 2001 Aquatic Sciences Meeting, February 12-16, Albuquerque, NM.
- 2000 *Invited*, **Sundareshwar, P. V.**, and C. J. Richardson. Present and Historical Water Quality on the Cape Fear River: Effects of Lock and Dam Structures. Joint Technical Committee Meeting of the Cape Fear River Assembly. Clinton, NC, November 1.

- 2000 Morris, J. T., **P. V. Sundareshwar**, C. Nietch, and D. Cahoon. The role of sea level cycles in controlling the net exchange of materials between embayments and the coastal ocean. Presentation made at the annual meeting of the American Society of Limnology and Oceanography, Copenhagen, June 6.
- 1999 **Sundareshwar, P. V.**, J. T. Morris. Anthropogenic signatures in phosphorus species and phosphatase activity as indicators of trophic status of coastal wetlands. 15th Biennial International Conference of the Estuarine Research Federation, New Orleans, Louisiana, September 25-30.
- 1999 Morris, J. T., **P. V. Sundareshwar**, C. Nietch, D. Cahoon. The tracking of sea level change by coastal wetlands. 15th Biennial International Conference of the Estuarine Research Federation, New Orleans, Louisiana, September 25-30.
- 1999 Kinsey, S. T., J. Vollenweider, **P. V. Sundareshwar**. Phosphorus compounds distribution in estuarine sediments of southeastern North Carolina. 15th Biennial International Conference of the Estuarine Research Federation, New Orleans, Louisiana, September 25-30.
- 1999 **Sundareshwar, P. V.** Differential nutrient limitation in a salt marsh estuary: Understanding Coastal Wetland processes and their response to anthropogenic influences. South Carolina Academy of Sciences meeting, Greenwood, SC.
- 1999 **Sundareshwar, P. V.** and Morris J. T. Differential Nutrient Limitation among Trophic Groups in a Pristine Salt marsh Estuary, South Carolina, USA. Poster, American Society of Limnology and Oceanography, Aquatic Science meeting, Santa Fe, New Mexico. Best Poster Award.
- 1998 **Sundareshwar, P. V.**, Paludan, C., Morris J. T., Pellechia P. J., and Cohen H. Phosphorus Speciation and Distribution in Wetland Sediments along an Estuarine Salinity Gradient on the Urbanized Cooper River Estuary, South Carolina, USA. Poster, American Society of Limnology and Oceanography / Ecological Society of America Joint meeting, St. Louis.
- 1998 **Sundareshwar, P. V.** and Morris J. T. Phosphorus Dynamics in Coastal Wetlands of South Carolina. Graduate Student Day Presentations, University of South Carolina.
- 1998 **Sundareshwar, P. V.** Phosphorus Dynamics in impacted and non-impacted Coastal Wetlands of South Carolina: Are there Linkages between Natural Processes and Anthropogenic influences. Presentation during the evaluation of South Carolina's ACE Basin NERR.
- 1997 **Sundareshwar P. V.** and Morris J. T. Phosphorus Sorption Characteristics of Intertidal Marsh Sediments along an Estuarine Salinity Gradient. 14th Biennial Estuarine Research Federation International Conference – “The State of our Estuaries”, Providence, Rhode Island, October 12 – 16, 1997.

TEACHING EXPERIENCE

- GEOL 412/512 - Coordinator Environmental field camp in India, May, 23 – June 14, 2009, Chennai, India

- GEOL 412/512 Coordinator Environmental field camp in India, May, 26 – June, 13, 2008, Chennai. India
- Developing an innovative pedagogical model to enhance participation and retention of Native American Students in graduate research and education.
- BIOL 311 Principles of Ecology (South Dakota School of Mines and Technology)
- ATM 406 / BIOL 403 Global Environmental Change (South Dakota School of Mines and Technology)
- ATM 402/502 Global Carbon Cycle (South Dakota School of Mines and Technology)
- ATM 403/503 Biogeochemistry (South Dakota School of Mines and Technology)
- ATM 603 Biosphere Atmosphere Interactions (South Dakota School of Mines and Technology)
- AES 808 - Fundamental Problems in Science and Engineering (South Dakota School of Mines and Technology)
- Wetland Field Skills (Duke University)
- Nutrient Biogeochemical Cycling in Estuarine Wetlands (Duke University)
- Coastal zone ecology and management (Duke University)
- Estuarine Ecology (Duke University)
- Introduction to Environmental Science (University of South Carolina)
- Introduction to Plant Biology, (University of South Carolina)

STUDENT ADVISING

Non-Thesis training and supervision:

1. Advised and trained 3 American Indian students in biogeochemistry during the Bridges to Success Program in 2005. Results were showcased on campus and in a regional conference
2. Advised and trained 1 American Indian student in environmental education and in biogeochemistry under the Bridges to Success Program. 2006. Ms. Patricia Hammond designed and presented a poster on ‘Promoting Environmental and Ecological Education and Awareness in the Medicine Root District’.
3. Shawn Honomichl – ATM undergraduate student who has now become proficient in analytical techniques used in biogeochemical research.
4. Kyle Brehe – MS student – trained in ecosystem science. Graduated 2007
5. Darren Clabo – MS student – Trained in ecosystem science.
6. Richard Lebeau – MS student – trained in water quality analyses
7. Christine Sandvik – Laboratory Assistant
8. Ashley Trennepohl – Undergraduate student- Geological Sciences

Thesis Supervision:

1. Sikchya Upadhyay – MS degree candidate. Expected graduation December 2010
2. Richard Lebeau – MS degree candidate. Expected graduation 2011
3. Mebratu Abessa – MS degree candidate. Expected completion Spring 2011
4. Jason Tinant – PhD degree candidate. Expected completion December 2013.
5. Sushil Gautam – PhD degree candidate. Expected completion December 2012
6. Anil Shreshtha – PhD degree candidate. Expected completion December 2013
7. Ashley Trennepohl – Senior thesis.

Membership in graduate and undergraduate degree committees:

1. Erin Landguth – MS Degree. 2005. Institute of Atmospheric Sciences (IAS)
2. Kelly Brenan – BS Degree. 2007. Interdisciplinary Studies
3. Ethan Morin – MS Degree. 2008. Geological Sciences
4. Josh Valder – PhD Degree. Expected graduation 2010. Atmospheric and Environmental Sciences (AES) – Civil and Environmental Engineering Department.
5. Netaji Sanaboyina – MS Degree. 2010. Civil and Environmental Engineering

PROFESSIONAL AND SYNERGISTIC ACTIVITIES

Reviewer for:

Journals:

Agronomy for Sustainable Development; Biogeochemistry, Continental Shelf Research, Ecological Engineering, Environmental and Experimental Botany, Estuaries, Estuarine Coastal and Shelf Sciences, Journal of Environmental Quality, Limnology and Oceanography, Mangroves and Salt Marshes, Marine Chemistry, Marine Pollution Bulletin, Nutrient Cycling in Agroecosystems, Science, Soil Science Society of America Journal, Wetlands, Wetland Ecology and Management, Journal of Environmental Management

Agencies:

The National Science Foundation;
NSF Program Panelist;
Water Resources Research Institute of the University of North Carolina,
United States Department of Agriculture;
National Oceanic and Atmospheric Administration;
Indo-US Science and Technology Forum;
U.S. Civilian Research and Development Foundation.
Georgian National Science Foundation

Professional Workshops & Community Service:

Member – National Coal Council Study Group – National Coal Council.

Member, Energy and Environment Committee, South Dakota School of Mines and Technology to streamline future thrust areas for the campus.

Member, Faculty Senate. SDSM&T

Executive Council Member for SDSM&T, Great Plains Cooperative Ecosystem Studies Unit. Responsible for facilitating approximately \$1 Million in new funding by initiating and successfully proposing SDSM&T's inclusion in the CESU partnership.

Program Committee Chair, Atmospheric and Environmental Sciences Graduate program, SDSM&T

Advisor, India Club at SDSM&T.

Socioeconomic Impact Analysis under National Environmental Policy Act (NEPA) (November 2001, Duke University Executive Education Program)

Committee Member, Preparing Future Faculty Advisory Committee, University of South Carolina

Orientation to rural development programs: formation of self-help groups, credit management and development programs with a focus on women. (1992. Mysore Resettlement and Development Agency (MYRADA) India)

Course in Environmental Science (1988-1989, World Wildlife Fund, India)

Vertebrate Ecology Workshop (1988-1989, Ministry of Science and Technology-Government of India, and The Bombay Natural History Society)

Nature Orientation Camp (1989, The Bombay Natural History Society): Guided field trips to National Parks and Wildlife sanctuaries to foster Nature Awareness in school children and general public.

Nature Leadership Camp (1986, World Wildlife Fund, India): Instructor, nature camps for students at the National Defense Academy, India.

Member of Societies:

American Geophysical Union (AGU), American Society of Limnology and Oceanography (ASLO); Ecological Society of America (ESA); Estuarine Research Federation (ERF); Society for Ecological Restoration (SER); Soil and Water Conservation Society (SWCS); World Wildlife Fund (WWF)