

APRIL 22-23, 2004

# 20<sup>th</sup> ANNIVERSARY

HUDSON-DELAWARE REGIONAL CHAPTER  
ANNUAL MEETING



National Gateway Recreation Area  
Fort Hancock, Sandy Hook, NJ  
and  
Howard Marine Science Laboratory

**Hudson Delaware Chapter  
SETAC Annual Meeting**

<b>Thursday April 22, 2004</b>		
Time	Short Course/Activity	Instructor
<b>8:00 - 10:00 a.m.</b>	<i>Registration Open/Breakfast</i>	
9:00 - 12:00 p.m.	Boat Trip: Estuarine Biomonitoring	Bruce Boyd
9:00 - 12:00 p.m.	Marsh Ecology	Michael P. Weinstein
9:00 - 12:00 p.m.	Ecological Risk Assessment	Mark Huston
9:00 - 12:00 p.m.	Chemical Techniques for Analyses of Fisheries Data	Ashok Deshpande, Vince Guida, Beth Sharack
9:00 - 10:30 a.m.	Geography and Bird Migration at Sandy Hook	Scott Barnes
9:00 - 10:30 a.m.	Tragedies and Comedies of the Commons	Bonnie McCay
10:30 - 12:00 p.m.	Biotic Ligand Model	Paul Paquin
10:30 - 12:00 p.m.	Sandy Hook Lighthouse Tour	Tom Laverty
<b>12:00 - 1:00 p.m.</b>	<b><i>Lunch/Poster Viewing</i></b>	
1:00 - 4:00 p.m.	Afternoon Boat Cruise and Sediment Sampling	Jim Nickels
1:00 - 4:00 p.m.	Muddying the Water: A Primer in Sediment Toxicology	Scott Douglas
1:00 - 4:00 p.m.	Benthic Macroinvertebrates	Don Dorfman
1:00 - 2:30 p.m.	Marine Biology	Marion McClary
1:00 - 2:30 p.m.	Historical Tour of Sandy Hook	Tom Hoffman
2:30 - 4:00 p.m.	Native Eye for the Modern Guy	Brian Harris
2:30 - 4:00 p.m.	The Ecology of Sandy Hook in 90 Minutes	Dery Bennett
4:00 - 5:00 p.m.	Volleyball Classic	Everyone
4:00 - 6:00 p.m.	On-site Air Response Bus	
<b>5:00 - 6:00 p.m.</b>	<b><i>Poster Session</i></b>	
<b>6:00 p.m.</b>	<b><i>Seafood Extravaganza</i></b>	

<b>Friday April 23<sup>rd</sup>, 2004</b>		
Time	Activity	Presenter
6:30 - 8:15 a.m.	Bird Walk	Laurie Gneiding
<b>7:30 - 8:30 a.m.</b>	<b><i>Registration Open/Breakfast</i></b>	
8:15 - 8:30 a.m.	Opening Remarks	Betty Jane Boros-Russo
8:30 - 9:15 a.m.	Platform #1	Gary A. Buchanan
9:15 - 10:00 a.m.	Platform #2	David B. Mickunas
10:00 - 10:45 a.m.	Platform #3	David W. Charters
<b>10:45 - 1:00 p.m.</b>	<b><i>Poster Session</i></b>	
<b>11:30 - 1:00 p.m.</b>	<b><i>Lunch</i></b>	
1:00 - 2:30 p.m.	Keynote	Richard M. Linnehan
2:30 - 3:00 p.m.	Poster awards	Paul Paquin
3:00 - 4:30 p.m.	Chapter Business Meeting	Chris Nally

## SHORT COURSE DESCRIPTIONS

Thursday, April 22, 2004

### **COURSE I. ESTUARINE BIOMONITORING**

**Instructor: Bruce Boyd, Marine Academy of Sciences and Technology (MAST)**

**Course Duration: 3 hours, 9:00 AM- 12:00 PM**

Captain Bruce Boyd of the MAST and several of his students will take approximately 25 individuals out to cruise Sandy Hook Bay on the *Blue Seas* vessel. You will learn how to conduct biomonitoring activities using a variety of sampling equipment including trawls, plankton nets, and ponars. Students will trawl with a 30 ft. net and collect fish and invertebrates for examination and identification. During transit times, the resources of the estuary and the magnitude of the various environmental factors impacting them are discussed, as well as points of local importance and basic principles of navigation and scientific data acquisition. Be at the Chapel for registration by 8:15AM- the vans leave at 8:30 AM sharp to get to the Atlantic Highlands Marina for boat departure at 9:00AM

### **COURSE II. AFTERNOON BOAT CRUISE AND SEDIMENT SAMPLING**

**Instructors: Jim Nickels, Oceanographer, Aqua Survey, Inc.**

**Course Duration: 3 hours, 1:00 – 4:00 PM**

Many sites need to be characterized in marine and freshwater environments. Jim Nickels of Aqua Survey, Inc. will take a limited number of attendees out into Sandy Hook Bay aboard the self-propelled lift-vessel *R/V Robert E. Hayes* to demonstrate sediment electro-vibracoring, split-spoon drilling, various grab sampling methods and the use of navigation and precision positioning equipment. The vessel will also demonstrate its ability to lift out of the water.

### **COURSE III. MARSH ECOLOGY**

**Instructor: Michael P. Weinstein, Ph.D., President/CEO NJMSC**

**Course Duration: 3 hours, 9:00 AM – 12:00 PM**

This program provides an opportunity to investigate one of the most productive ecosystems on earth-the salt marsh. The program will take place in Sandy Hook's salt marsh environment at Horseshoe Cove and will be led by Dr. Michael P. Weinstein. Dr. Weinstein is the President/CEO of the New Jersey Marine Sciences Consortium (NJMSC) and Director of the New Jersey Sea Grant College Program and will be sharing his extensive experience in marsh research including restoration. Topics to be discussed include marsh vegetation and zonation, trophic dynamics and water quality. Hands-on activities to be facilitated by NJMSC Education Program staff will include seining, as well as benthic and plankton sampling.

#### **COURSE IV. ECOLOGICAL RISK ASSESSMENT**

**Instructor: Mark Huston, U.S. Fish and Wildlife Service, assisted by George Molnar, Lockheed-Martin REAC, and Richard Henry U.S. Fish and Wildlife Service**

**Course Duration: 3 hours, 9:00 AM – 12:00 PM**

This short course is designed as a basic introduction to the 8-step risk assessment process as outlined in the U.S. EPA's Ecological Risk Assessment Guidance for Superfund. An overview will include the development of screening level risk assessments, problem formulation (including the development of assessment and measurement endpoints), and study design. In addition, risk assessment techniques such as food chain models, field studies, and physical data will be reviewed and discussed.

Mark Huston has a B.S. from East Stroudsburg University in Pennsylvania and M.S. from the University of Wisconsin-La Crosse. Since 1999, he has been with the U.S. Fish and Wildlife Service and is a Technical Liaison between the Service and the U.S. EPA. Mark has previously taught courses in Ecological Risk Assessment for the U.S. Fish and Wildlife Service National Conservation Training Center and at the 2003 National SETAC meeting. Mark will be assisted by George Molnar and Richard Henry. George is a senior biologist and risk assessor with Lockheed-Martin and is currently assigned to the EPA's Response Engineering and Analytic Contract (REAC). Richard is a National Technical Liaison with the U.S. Fish and Wildlife Service.

#### **COURSE V. GEOGRAPHY AND BIRD MIGRATION AT SANDY HOOK**

**Instructor: Scott Barnes, Senior Naturalist, Sandy Hook Bird Observatory, New Jersey Audubon Society**

**Course Duration: 1.5 hours, 9:00 – 10:30 AM**

Sandy Hook is a six-mile long peninsula that juts north at the top of the Jersey shore. Its varied natural habitats and adjacent waters provide a critical stopover site for migratory animals, especially birds. Geography, weather patterns, and habitat combine to make Sandy Hook an exciting place to understand the mechanics of migration and witness it happening. Mid-April is an excellent time of year to see numbers of short-distance migrants, heading north from the southern portion of the United States. It is also the time when the first neotropical migrants like flycatchers and swallows arrive, and is the peak season for northbound raptors.

The program will likely take place around the north pond area at Sandy Hook, where the annual Sandy Hook Spring Migration Watch counts migratory waterbirds and raptors. North Pond offers several adjacent habitat types including freshwater wetland, dunes, scrub-shrub, and maritime forest.

Scott Barnes began birding at the age of twelve and has been an avid naturalist ever since. Encouragement and learning came from his parents and many birders, including members of the Urner Ornithological Club and staff of New Jersey Audubon Society. An interest in travel and natural history has led him from northwestern Alaska to Trinidad & Tobago in search of plants and animals. He cut his birding teeth at Sandy Hook, where he is the Senior Naturalist for the Sandy Hook Bird Observatory. Scott is the Region 3 Editor for Records of New Jersey Birds, compiles the Sandy Hook Christmas Bird Count and the weekly statewide Rare Bird Alert, is the current chair of the New Jersey Bird Records Committee, and a tour leader for the NJ Audubon Travel Program.

## **COURSE VI. TRAGEDIES AND COMEDIES OF THE COMMONS**

***Instructor:* Bonnie McCay, Ph.D. Department of Human Ecology, Cook College, Rutgers University**

***Course Duration:* 1.5 hours, 9:00 – 10:30 AM**

The idea of "the tragedy of the commons" has been a popular way of explaining environmental problems. This short course will engage participants in a simulation of "commons" situations in order to highlight both the challenges involved in using commonly-held or open-access resources (which lead to "tragedies") and some of the basis for cooperation and successful management (the "comedies"), such as communication, trust, and reciprocity.

Bonnie McCay, chair and professor in the Department of Human Ecology at Cook College, Rutgers University, has studied common property issues in marine fisheries in both Canada and the U.S. She currently serves on the Federal Advisory Committee on Marine Protected Areas for the Departments of Commerce and Interior and a National Research Council committee on Social Science Issues for Environmental Decision-Making.

## **COURSE VII. CHEMISTRY TECHNIQUES FOR ASSESSMENT OF FISHERIES DATA**

***Instructors:* Ashok Deshpande, Ph.D., Vince Guida, Ph.D., and Beth Sharack**

**NOAA/NMFS/NEFSC James J. Howard Marine Science Laboratory**

***Course Duration:* 3 hours, 9:00 AM- 12:00 PM**

Vince Guida, Research Fishery Biologist, NMFS/NEFSC, studies the gross biochemical composition in young fishes as they develop toward reproductive maturity. His section of the course will include an explanation and demonstration of lipid class analysis via Thin Layer Chromatography/Flame Ionization Detection (Iatroscan) as a tool for understanding and monitoring growth and development in young fishes, including the detection of such environmental influences as juvenile diet and exposure to contaminants.

Beth Sharack, Chemist, and Project Leader, NMFS/NEFSC, addresses whether ICPMS (Inductively Coupled Plasma Mass Spectrometry)-based otolith microconstituent analysis can resolve bluefish stock structure issues. Otoliths are calcareous "stones" on which the fish lay down sequential layers of material that retain a signal characteristic of the area in which the fish resided at the time of deposition. In the Trace Metal Suite, we have an ICP-MS, FIAS (Flow Injection Analysis System), flame and furnace Atomic Absorption and Micromilling instrumentation. The course will include observation of sample prep and analyses of either otolith or marine sediment samples utilizing one or more of the instruments listed above.

Ashok Deshpande, Research Chemist, NMFS/NEFSC, measures concentrations and patterns of polychlorinated biphenyls in fish (currently bluefish) and measures biomarkers of exposure in order to understand the relationship between habitat quality and fish condition. The organic laboratory at J.J. Howard Laboratory supports a variety of instruments for analysis including High Performance Liquid Chromatography (HPLC), Gas Chromatograph-Electron Capture Detector (GC-ECD) and GC-Mass Spectrophotometer (GC-MS). The course will include observation of organic analysis of fish tissue using one or more of the instruments listed above.

Class size is limited to 12 people due to laboratory space. Names of all participants need to be provided to the laboratory at least one week ahead of time and all participants need to bring a photo I.D. to get into the laboratory.

### **COURSE VIII. BIOTIC LIGAND MODEL**

***Instructor: Paul Paquin, Ph.D., HydroQual, Inc.***

***Course Duration: 1.5 hours, 10:30 AM- 12:00 PM***

Water quality criteria (WQC) for metals have been developed to protect the integrity of aquatic systems. However, tests used to develop WQC were performed in laboratory waters that often are not representative of natural waters. Water effect ratio (WER) tests account for the effects of substances that alter the toxicity of metals in natural waters but can be costly and time-consuming. The biotic ligand model (BLM) has been developed as an alternative to conducting WER tests. The BLM may assist in developing technically defensible site-specific criteria, waste load allocations, and ecological risk assessments. It is intended to promote more focused and efficient uses of resources in the regulation and control of metals and the protection of the environment. The BLM is under review by regulatory agencies and is being considered for use in refining water quality criteria in the United States, South America, and elsewhere.

### **COURSE IX. MUDDYING THE WATER: A PRIMER IN SEDIMENT TOXICOLOGY**

***Instructor: W. Scott Douglas, Office of Maritime Resources/New Jersey Department of Transportation (OMR/NJDOT)***

***Course Duration: 3 hours, 1:00 – 4:00 PM***

This three-hour lecture and laboratory class will focus in on the principles of sediment toxicology in both freshwater and marine ecosystems. Particular attention will be paid to the various regulatory programs that provide guidance for the assessment of contaminated sediments and their current test methods, including the assessment of sediments proposed for dredging. During the laboratory portion of the class, test organisms, chambers, and equipment will be available for hands on experience. By the end of the class, students should understand when, why and how sediments are assessed as well as the strengths and weaknesses of various methods available.

Mr. Douglas is a nationally recognized sediment toxicologist with over 15 years of experience that includes sampling and testing, experimental design, benthic community analysis and policy and planning in both freshwater and marine ecosystems. Mr. Douglas is a past President of the Hudson-Delaware Chapter of SETAC and recently served on the Steering Committee for a SETAC Pellston Workshop on sediment quality guidelines. He is currently the Dredging Program Manager for OMR, and manages over \$150 million in dredging and dredged material research projects. Mr. Douglas represents NJDOT on various interagency technical and dredged material management forums concerned with sediment quality in the NY/NJ Harbor and has been the spokesman for State policy on dredged material management throughout the region.

## **COURSE X. BENTHIC MACROINVERTEBRATES**

***Instructor: Don Dorfman, Ph.D. Monmouth University, Department of Biology***

***Course Duration: 3 hours, 1:00 – 4:00 PM***

This short course on benthic organisms will include brief discussions of marine versus freshwater invertebrates and their ecology, effects of water quality parameters (D.O., temperature, salinity, pollutants), sample collection (e.g., ponar grab, Eckman dredge), sample containers and preservatives, sample processing equipment and methods, keys for identification, sample storage, and analysis of data.

Dr. Don Dorfman is a professor of biology at Monmouth University in West Long Branch, New Jersey. He currently teaches classes in invertebrate and vertebrate zoology, marine biology, and ichthyology. He is also does consulting work in the eastern United States, Senegal, Mali, Mauritania, Burkina Fosso, Niger, Nigeria, Cameroon, Guinea, Chad, Gambia, the Ivory Coast, Bangladesh, and Mexico for various agencies, including USAID, and West African Economic Community, UNFAO. He received his PhD in environmental science from Rutgers University, a Masters Degree in freshwater fisheries from the University of Connecticut.

## **COURSE XI. MARINE BIOLOGY**

***Instructor: Marion McClary Ph.D. Fairleigh Dickinson University, Department of Biology***

***Course Duration: 1.5 hours, 1:00 – 2:30 PM***

This course will cover the physical and chemical features of the marine environment and the strategies that marine organisms use to deal with such features. The physical and chemical features to be discussed in the lecture include tides, temperature, substrate, wave action, salinity, and dissolved oxygen. The strategies to be discussed include migration, evaporative cooling, depression of freezing points, mucus production, burrowing, attachment, shell closure, osmoconforming, osmoregulating, and alternating between independent and dependent respiration. Concepts from the lecture will be tested, “hands-on”, in the laboratory by exposing selected marine animals to various salinities and observing shell closure.

The instructor, Dr. Marion McClary, Jr., is an Assistant Professor of Biological Sciences at Fairleigh Dickinson University (Teaneck-Hackensack Campus). He received his B.S. in Marine Science from the Richard Stockton State College of New Jersey. He received his Ph.D. in Zoology from Duke University.

**ACTIVITIES DESCRIPTIONS**  
**Thursday, April 22, 2004**

**SANDY HOOK LIGHTHOUSE TOUR**

***Instructor: Tom Laverty, Twin Lights Historic Society***  
***Thursday Morning, 10:30 AM- 12:00 PM***

The tall, white lighthouse at Sandy Hook is the oldest standing light tower in the United States. Since 1764, the lighthouse's unfailing beam has befriended innumerable vessels as they have passed in or out of New York's great harbor. Because of the risks to shipping in the treacherous waters around Sandy Hook, numerous merchants in New York City pressed the colony's government for the erection of a lighthouse on the desolate point. New York's assembly answered their pleas with an act in 1761 that authorized the holding of a lottery to raise funds for the construction of a lighthouse. This lottery raised \$62,600, but in 1763 another lottery had to be held to raise additional money. The builders finished the structure in 1764 and on June 11 its lamps were lit for the first time.

The National Park Service and New Jersey Lighthouse Society work together to provide tours of this historic structure. Tours take about half an hour led by a guide from the New Jersey Lighthouse Society. At the top of the tower visitors get a sweeping panoramic view of Sandy Hook, the Atlantic Ocean and New York City skyline. Eight climbers can be accommodated at a time and tours are on a first –come-first-serve basis.

**HISTORICAL TOUR OF SANDY HOOK**

***Instructor: Tom Hoffman, Park Historian, National Park Service***  
***Thursday Afternoon, 1:00 – 2:30 PM***

Starting at the former Fort Hancock Post Chapel, Park Ranger, Historian Tom Hoffman will lead a walk around the fort and fill you in on Sandy Hook's military and maritime heritage. The first stop will be at History House, located at the north end of fort's Officers Row, to see the restored interior of one of the stately looking married officers quarters. The next stop will be at the Fort Hancock Museum, which originally served as the Post Guardhouse. From there we will walk over to the Sandy Hook Lighthouse and see a short history video about the oldest operating lighthouse in the United States that still helps guide ships into New York Harbor. We will continue on to see three of the fort's historic gun batteries, the Mortar Battery, Battery Granger, and Battery Potter, which once protected New York Harbor from attack by sea from the 1890's into World War II. From Battery Potter, we will return to the former chapel.

Ranger Historian Hoffman is a native of New Jersey and a graduate of Jersey City State University. His interest in Sandy Hook's rich history has kept him based here since the U.S. Army transferred Fort Hancock to the National Park Service in 1975.

#### **NATIVE EYE FOR THE MODERN GUY**

***Instructor: Brian Harris, New Jersey Marine Science Consortium***

***Thursday Afternoon, 2:30 – 4:00 PM***

Join NJMSC's Pre-College Program Coordinator and resident Lenape Specialist Brian Harris for an afternoon hike focused on natural coastal resources as seen through the "eyes" of the Native American people who long ago inhabited and visited Sandy Hook. Using examples of vegetation that can still be seen at Sandy Hook's Horseshoe Cove, the program will explore the many roles these plants played in the survival, livelihood and culture of New Jersey's coastal Natives.

#### **THE ECOLOGY OF SANDY HOOK IN 90 MINUTES**

***Instructor: Dery Bennett, American Littoral Society***

***Thursday Afternoon, 2:30 – 4:00 PM***

This will be an informal walk to observe and discuss some of the natural areas of the Hook, including dunes and beaches, and the wildlife that inhabits them. Bring binoculars, if you have them. This discussion will be lead by Dery Bennett of the American Littoral Society. Dery has been with the American Littoral Society for more than 30 years.

### **ACTIVITY DESCRIPTIONS**

**Friday April 23, 2004**

#### **COASTAL BIRD WALK**

***Instructor: Laurie Gneiding, AMEC Earth & Environmental, Inc.***

***Friday Morning, 6:30-8:00 AM***

Laurie will lead the early risers through the diverse habitats of Sandy Hook Park to identify just a few of the 300 bird species that inhabit the area. Sandy Hook is home to approximately 25 endangered and threatened species of birds. Everyone will meet at the boardwalk at the visitors center and walk the path to the salt marsh, followed by a view from the observation deck at the North beach. From the observation deck, you will see the closed beaches that are nesting sites of the Piping Plover, the Least Tern, and many migrating birds.

**PLATFORM PRESENTATIONS**  
**Friday, April 23, 2004**

**PLATFORM 1. Initial Assessment of Mercury and PCB Trends in Fish from New Jersey's Waters.**

***Presenters: Gary A. Buchanan and Bruce Ruppel, NJDEP***

Gary A. Buchanan is a research scientist with the Division of Science, Research, and Technology, NJ Department of Environmental Protection. He functions as an ecotoxicologist on the NJ Toxics Reduction Work Plan for the Harbor Estuary Program, and as Chair of the interagency Toxics in Biota Committee that develops and recommends state fish consumption advisories. Gary was also Chair of the Ecological Quality Work Group for the NJ Comparative Risk Project, which examined the risk of stressors to NJ's ecosystems, and is currently conducting research on fish biomarkers and bioaccumulation of soil contaminants. He has managed several technical groups under EPA and Army Corps of Engineer contracts, which have conducted numerous environmental, ecological and ecotoxicological investigations at sites across the United States. Gary has a BS and MA in Biology from Montclair State University and a Ph.D. in Environmental Science from Rutgers University.

The NJ DEP has collected upper trophic level (striped bass, bluefish, largemouth bass and chain pickerel) fish tissue data since the late 1970's and these data have been used to issue fish consumption advisories to the public since the early 1980's. The results of these historical as well as more recent PCB and mercury data will be presented along with trends in contaminant concentrations.

**PLATFORM 2. The Use of a Mobil Trace Atmospheric Gas Analyzer (TAGA) as a Cost-Effective and Real-Time Approach to the Evaluation of Air Quality.**

***Presenter: David B. Mickunas, USEPA Environmental Response Team***

David B. Mickunas is a chemist with the EPA's Environmental Response Team. He provides air sampling, analysis, monitoring and modeling capabilities during hazardous material operations and advances innovative air monitoring technologies such as remote optical sensing instrumentation (OP-FTIR & OP-UV), mobile triple quadrupole mass spectrometers, and field portable gas chromatograph with various detectors (mass selective, electron capture, etc.). Dave has been involved with major national response activities including the indoor air study at the Highway 71/72 Site in Bossier City, LA, the pentaborane destruction analysis at Edwards Air Force Base, CA and at the University of Florida in Gainesville, and ambient air monitoring at the Tennessee Products Site, TN. He was also one of the lead investigators during the World Trade Center Response following the 911 terrorist attacks and during the decontamination of the Hart Senate Building. Dave has a BA in Chemistry and BS in Chemical Engineering.

Dave will be talking about use of the mobile TAGA in concert with the collection of spatial and meteorological data to evaluate contamination of both indoor air and ambient air. The TAGA is a real-time, direct-air sampling, laboratory instrument that is mounted in a bus-like vehicle along with a Global Positioning System and computer systems used to integrate spatial and analytical data into a Geographic Information System. The TAGA bus will be on-site (pending emergency response requirements) and available for examination by interested individuals.

**PLATFORM PRESENTATIONS**  
**Friday, April 23, 2004**

**PLATFORM 3. Life at the Intersection of Reality and Policy in the Town of Ecological Risk..... Ok, So It's Really Not an Intersection.... More of a Traffic Circle. You Drive in with Hope, and Then Spend an Inordinate Amount of Time Going in Circles, and in the End, You Just Hope to Get out with Your Life.**

***Presenter: David W. Charters, USEPA, Superfund Ecological Risk Program Manager***

David is the Superfund Ecological Risk Program Manager for the U.S. EPA and is a member of the Environmental Response Team with an emphasis on evaluations of ecological risk assessment. He is involved with the preparation of guidance documents concerning ecological risk assessment and assists in the creation of policy for Superfund. He determines the effects of contaminants on the environment and supplies technical assistance to Superfund to all Regions, Headquarters and the international community. David specializes in the utilization and the development of ecological risk assessment evaluative techniques for use in the field. National responses include mercury contamination in Lavaca Bay, TX; mining wastes in Del Norte, CO and Clear Creek, CO; PCB contamination in the Kalamazoo River, MI; the Love Canal NY contamination; and a hazardous waste dump in Casmalia, CA. International sites include a mercury contamination scare in fish in the United Arab Emirates, and he was a team leader of the United Nations delegation to evaluate a cyanide spill at a gold mine in Guyana. David has a BS in Biology, Syracuse University and a Ph.D. in Biology (Environmental Pathology), SUNY Binghamton.

David will talk about the development of guidance and policy and the implications on the technical approach used in conducting Ecological Risk Assessments.

**KEYNOTE PRESENTATION**  
**Friday, April 23, 2004**

**Richard M. Linnehan, DVM**

**Environmental Issues as Seen from Space – A Unique Perspective**



Come meet this year's annual meeting keynote speaker astronaut Richard M. Linnehan (DVM). Dr. Linnehan, a veteran of three space flights, has logged over 43 days in space, including three space walks totaling 21 hours and 9 minutes. Appearances of active astronauts are rare. Rick has assured us that he will fly into Newark Thursday night and be our keynote speaker Friday barring any unforeseen operational commitments or mission priorities.

Rick is looking forward to sharing his experience as a NASA scientist with us. Few people that you have ever met will have his perspective of the world. If you have ever wondered what it would be like to be an astronaut or what motivates a person to leave the safety of the shuttle and step into space untethered...this is your chance to find out...your chance to meet a real adventurer. Rick Linnehan was also named along with Ben Afflec to be 2002 People Magazines "Sexiest Man Alive".

Rick, a graduate of University of New Hampshire, received his DVM from Ohio State University of Veterinary Medicine in 1985. He is a member of American Veterinary Medical Association of Zoo Veterinarians, the International Association of Aquatic Animal Medicine, and the Association of Space Explorers. He is a Board member of the Texas Marine Mammal Stranding Network and the Tulane/Xavier/NASA Astrobiology Center, New Orleans, Louisiana. Selected by NASA in March of 1992, Dr. Linnehan reported to the Johnson Space Center in August of 1992 where he completed one year of Astronaut Candidate training qualifying him for Space Shuttle flight assignments.



Dr. Linnehan keynoting continues the tradition of having with incredible keynote speakers (e.g., Pulitzer prize winners, Emmy winners, governors...). Rick tells us that he is looking forward to meeting you. Google *Richard Linnehan* for more information about Rick.

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