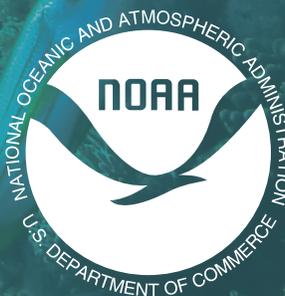


NATIONAL OCEAN EXPLORATION FORUM

November 19-20, 2015



**NATIONAL
AQUARIUM®**



WELCOME.

The National Aquarium, in partnership with NOAA, is pleased to welcome you to “Characterizing the Unknown: A National Ocean Exploration Forum 2015.” This year’s forum is an opportunity for us—as scientists, academics and educators—to convene and update one another on our perspectives, activities and aspirations in the field of ocean exploration. Over the next two days, we’ll explore the possibilities of integrating multiple observation platforms, technologies and tools into a more comprehensive, effective and efficient national capacity. Thank you in advance for your contributions—they could help set a new standard for exploring unknown ocean areas and phenomena.

#NOEF2015



DAY ONE

November 19, 2015 | National Aquarium 4-D Immersion Theater

1 PM **Forum Welcome**
Forum Chair: John C. Racanelli | *National Aquarium*

1:15 PM **Introduction**
Craig McLean | NOAA Office of Oceanic and Atmospheric Research

1:30 PM **Keynote: Toward a National Ocean Exploration Program**
Jerry R. Schubel | Aquarium of the Pacific

2 PM **Exploration Forums: Progress**
*Vice Admiral Paul G. Gaffney II USN (retired) President Emeritus
Monmouth University and Chair | Ocean Exploration Advisory Board*

2:15 PM **Break**

2:50 PM **Federal Ocean Exploration Panel**
“If you could visit only once, what information MUST you have?”
Moderator: Jerry Miller | *National Research Council*
Panelists: Scott Borg | *National Science Foundation*
 William Yancey Brown | *Bureau of Ocean Energy Management*
 Rear Admiral Timothy C. Gallaudet, USN Oceanographer and Navigator of
 the Navy and Commander | *Naval Meteorology and Oceanography Command*
 John Haines | *U.S. Geological Survey*
 Rear Admiral David Score | *NOAA Commissioned Officer Corps, NOAA Office of Marine and*
 Aviation Operations
 Mary Voytek | *NASA*

4 PM **Community Ocean Exploration Panel**
“Why do you do what you do? What must you achieve?”
Moderator: Michael Conathan | *Center for American Progress*
Panelists: Robert Ballard | *Ocean Exploration Trust*
 Mary “Missy” Feeley | *ExxonMobil Exploration Company*
 Eric King | *Schmidt Ocean Institute*
 Dave Loyalvo | *Global Foundation for Ocean Exploration*
 Shirley Pomponi | *NOAA Cooperative Institute for Ocean Exploration, Research and Technology*
 Philip Renaud | *Khaled bin Sultan Living Oceans Foundation*

5:10 PM **Synthesis Panel Remarks**
Moderator: John C. Racanelli | *National Aquarium*
Panelists: Michael Conathan | *Center for American Progress*
 Craig McLean | *NOAA Office of Oceanic and Atmospheric Research*
 Jerry Miller | *National Research Council*
 Jerry R. Schubel | *Aquarium of the Pacific*

5:45 PM **Group Photo**

6:30 PM **Reception and Dinner**
Keynote Speaker: Ellen Stofan | *NASA*

DAY TWO

November 20, 2015 | Pier 5 Hotel

9 AM **Welcome and Remarks**
Jerry R. Schubel | *Aquarium of the Pacific*

9:15 AM **Future Forward: A Marketplace of Ideas**
The Marketplace of Ideas highlights new and developing technologies and approaches that could change ocean exploration over the next five years. Speakers will give short presentations; the audience will have an opportunity to ask questions at the end of the session.
Moderator: David Lang | *OpenROV*

Kickstarter for Science
Aurora Thornhill | *Kickstarter*

Ocean Exploration Data and the Next Generation
Timothy Kearns | *Ocean Aero*

Citizen Science Movement
Caren Cooper |
North Carolina Museum of Natural Sciences

Exploring Earth and Space
Darlene Lim | *NASA*

Connected Exploration
Eric Stackpole | *OpenROV*

eDNA Analysis in Exploration
Jimmy O'Donnell | *University of Washington*

Visualization Tools
Jonathon Knowles | *Autodesk*

In Situ 3-D Visualization
Dominique Rissolo | *University of California, San Diego*

Undersea Exploration on Europa
Kevin Hand | *NASA*

Social Media and the Sea
Andrew David Thaler | *Southern Fried Science*

12 PM **Lunch**

1 PM **Group Breakout Sessions**
Speaker: Alan P. Leonardi | *NOAA Office of Ocean Exploration and Research*
Participants will break into working groups, organized by ocean features, to design a conceptual expedition for the year 2020 starting with drivers and questions, and including tools and techniques expected to be available in the next five years. Having heard about requirements from government and non-government explorers and about new ideas and developments, consider the question of how we can mobilize partners, assets, technologies and methods to maximize the value of future expeditions toward establishing baseline characterizations of the greatest possible value.

Expedition concepts will be organized using themes developed in Ocean Exploration 2020:

- Exploration priorities
- Citizen science
- Key partnerships
- Data and data visualization
- Platforms
- Public engagement
- New technologies and methodologies

5:10 PM **Synthesis Panel Remarks**
Moderator: John C. Racanelli | *National Aquarium*
Panelists: Craig McLean | *NOAA Office of Oceanic and Atmospheric Research*
Jerry Miller | *National Research Council*
Jerry R. Schubel | *Aquarium of the Pacific*

6:15 PM **Closing Remarks**
Forum Chair: John C. Racanelli | *National Aquarium*

MEET OUR SPEAKERS.



ROBERT BALLARD

Founder | Ocean Exploration Trust

Among the most accomplished and well-known of the world's deep-sea explorers, Robert Ballard is best known for his historic discoveries of hydrothermal vents, the sunken RMS *Titanic* and the German battleship *Bismarck*. He has conducted more than 120 deep-sea expeditions using the latest in exploration technology and is a pioneer in the early use of deep-diving submarines.

Ballard has pioneered distance learning in classrooms around the world with the JASON Project, an award-winning educational program that reaches more than 1 million students and 25,000 teachers annually. He has received prestigious awards from the Explorers Club and the National Geographic Society—the Explorers Medal and the Hubbard Medal, respectively—as well as the Lindbergh Award. In 2003, President George W. Bush presented him with the National Endowment for the Humanities Medal in the Oval Office of the White House.

Ballard is president of the Institute for Exploration, scientist emeritus from the Woods Hole Oceanographic Institution and director of the newly created Center for Ocean Exploration at the University of Rhode Island's Graduate School of Oceanography.

His ship of exploration, the *E/V Nautilus*, operated by his Ocean Exploration Trust, spends four to five months at sea each year.



SCOTT BORG

Head of the Antarctic Sciences Division of Polar Programs | National Science Foundation

Scott Borg has served in his current role at NSF since May 2003. The Antarctic Sciences Section is responsible for a research investment of about \$70 million annually and constitutes the bulk of the science activity of the United States Antarctic Program.

USAP science encompasses all of the geo- and biosciences, as well as space physics, astronomy and astrophysics. Particular emphases at this time in the realm of the geosciences is understanding the contribution of ice sheets to sea level rise and the role of the Southern Ocean in carbon cycling and climate change.

Borg came to NSF in 1992 from the U.S. Department of Energy, where he managed activities associated with characterization of the Yucca Mountain site as a potential nuclear waste repository. Prior to DOE, he conducted research in isotope geochemistry and geology at the University of California and conducted studies in environmental geology as a staff scientist at Lawrence Berkeley. His experience in Antarctic research spans more than 35 years.

Borg earned a bachelor's in geology from Pomona College, and a master's and doctorate in geology from Arizona State University. He holds licenses to practice geology in California and Oregon.

MEET OUR SPEAKERS.



WILLIAM YANCEY BROWN

*Chief Environmental Officer |
Bureau of Ocean Energy Management*

William Brown served as the science adviser to the secretary of the interior, Bruce Babbitt, from 1997 to 2001 and worked for the Interior Department earlier in his career. He is a former president and CEO of the Woods Hole Research Center, a leading nonprofit research organization that applies science to global environmental challenges.

Brown is a former president and CEO of the Academy of Natural Sciences, the nation's oldest natural history museum, in Philadelphia, and former president and CEO of the Bishop Museum, the leading cultural and natural history museum of the Pacific.

He has served as a volunteer director on many nonprofit boards, including chairing the Ocean Conservancy Board. Brown earned his Juris Doctor from Harvard Law School in 1977, his doctorate in zoology from the University of Hawaii in 1973, his master's in teaching from Johns Hopkins University in 1970 and his bachelor's in biology from the University of Virginia in 1969.



MICHAEL CONATHAN *(Moderator)*

*Director of Ocean Policy |
Center for American Progress*

Michael Conathan's work focuses on driving progressive solutions to the multitude of problems facing the world's oceans. Prior to joining the Center for American Progress, Conathan spent five years staffing the Senate Committee on Commerce, Science and Transportation's Subcommittee on Oceans, Atmosphere, Fisheries and Coast Guard—initially serving a one-year appointment as a Dean John Knauss Marine Policy Fellow before joining the committee full time as a professional staff member in 2007.

In that capacity, Conathan worked primarily for subcommittee ranking member Sen. Olympia Snowe, R-Maine, as well as the ranking members of the full committee, Sens. Ted Stevens, R-Ark., and Kay Bailey Hutchison, R-Texas. He oversaw enactment of multiple key pieces of ocean legislation, including the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act, the Integrated Coastal and Ocean Observing Act, the Federal Ocean Acidification Research and Monitoring Act, and the Shark Conservation Act.

A native Cape Codder, Mike received a master's in marine affairs from the University of Rhode Island in 2005 and also holds a Bachelor of Arts in English literature from Georgetown University.

MEET OUR SPEAKERS.



MARY "MISSY" FEELEY

*Former Chief Geoscientist /
ExxonMobil Exploration Company*

Missy Feeley retired from ExxonMobil Exploration Company as chief geoscientist in 2014. While with ExxonMobil, she was involved in oil and gas exploration activities in Africa, Asia and Europe. Her responsibilities included advising senior ExxonMobil Upstream management on strategic geoscience matters and identifying global geoscience opportunities for ExxonMobil.

Feeley is a member of the American Association of Petroleum Geologists, the Society of Exploration Geophysicists and the American Geophysical Union, among others. She has served on a number of ocean-related committees and working groups, including the National Research Council Ocean Studies Board from 2005 to 2010; the recent National Research Council Committee on Guidance for NSF on National Ocean Science Research Priorities: Decadal Survey of Ocean Sciences; the Scientific Committee on Oceanic Research Executive Committee; and the 2013 Global Partnership for the Oceans Blue Ribbon Panel.

Feeley earned her Ph.D. in oceanography from Texas A&M University.



VICE ADMIRAL PAUL GAFFNEY II
(Retired)

*President Emeritus Monmouth University and
Chair / Ocean Exploration Advisory Board*

Vice Admiral Paul Gaffney II, U.S. Navy (retired), chairs the Ocean Exploration Advisory Board, responsible for advising NOAA on priority areas for exploration, investments in new technologies and strategic planning for greater understanding of our planet's last frontier.

He's also the president emeritus of Monmouth University in New Jersey, an Ocean Policy Fellow in its Urban Coast Institute, a director of Diamond Offshore Drilling Inc. and the former chair of the Ocean Research and Resources Advisory Panel.

Vice Admiral Gaffney served as the 10th president of the National Defense University from 2000 to 2003 and the chief of naval research prior to that. He was the senior uniformed oceanography specialist in the Navy, having served as commander of the Navy Meteorology and Oceanography Command from 1994 to 1997.

Vice Admiral Gaffney graduated from the U.S. Naval Academy and holds two master's degrees in mechanical engineering (ocean) from Catholic University and in business administration from Jacksonville University. He has received honorary doctorates from the University of South Carolina, Catholic University and Jacksonville University. Vice Admiral Gaffney was a commissioner on the U.S. Commission on Ocean Policy.

MEET OUR SPEAKERS.



REAR ADMIRAL TIMOTHY C. GALLAUDET

Oceanographer and Navigator of the Navy and Commander | Naval Meteorology and Oceanography Command

The son of a Naval Intelligence officer, Rear Admiral Gallaudet received a bachelor's degree in oceanography from the U.S. Naval Academy and his master's and doctoral degrees in oceanography from Scripps Institution of Oceanography.

A naval oceanographer, Rear Admiral Gallaudet's afloat tours included Oceanographic Unit Five aboard USNS *Harkness*, USS *Peleliu*, USS *Kitty Hawk* and temporary assignments to the staff of Commander Sixth Fleet aboard USS *LaSalle* and USNS *Bowditch*. During these tours, Rear Admiral Gallaudet served in Operations Southern Watch, Provide Promise, Sharp Guard, Deny Flight, Enduring Freedom and Iraqi Freedom. While on USNS *Bowditch*, he participated in the first operational launch and recovery of an undersea glider from a Naval Oceanographic Survey (T-AGS) ship.

Ashore, Rear Admiral Gallaudet served with the Naval European Meteorology and Oceanography Center in Spain; the Naval European Meteorology and Oceanography Detachment in Greece; the Naval Oceanographic Office; and the staffs of the Commander, Naval Meteorology and Oceanography Command and the Oceanographer of the Navy. He served on the staff of the chief of naval operations as the deputy oceanographer of the Navy, before assuming command of the Naval Meteorology and Oceanography Command in June 2014.



JOHN HAINES

Associate Director (Acting) | U.S. Geological Survey

John Haines leads a coastal and marine geology program supporting research on such issues as storm, tsunami and earthquake hazards; coral reef health; sediment and contaminant transport; gas hydrates; and sand and aggregate resources.

A primary focus of the USGS coastal and marine program is to provide research and information products, including geologic, coastal and habitat maps; vulnerability assessments; and models that inform management decisions with respect to coastal change, natural hazards and marine resources.

Haines is responsible for engaging the breadth of USGS science in efforts to understand, forecast and respond to priority national issues, including coastal water quality, hazards, resource use and ecosystem restoration. He represents the USGS on the Joint Subcommittee for Ocean Science and Technology; is a former co-chair of the Interagency Working Group for Ocean and Coastal Mapping; and is a member of the Department of the Interior's Senior Ocean Policy Team.

Haines received his Ph.D. in physical oceanography from Dalhousie University in Halifax, Nova Scotia. He was appointed to his current position, based in Reston, Virginia, in 2001.

MEET OUR SPEAKERS.



ERIC KING

*Director of Marine Operations |
Schmidt Ocean Institute*

Eric King has worked in the maritime industry for over 20 years. During his career, he has been involved in the management of oceanographic research vessels, ocean salvage fleets, marine construction platforms and maritime regulatory compliance while an officer in the U.S. Coast Guard.

King holds a graduate degree in public administration from the University of Washington and an undergraduate degree in maritime transportation from Maine Maritime Academy.



DAVID LANG

Co-Founder | OpenROV

David Lang is the cofounder and president of OpenROV, a maker of low-cost underwater robots, and OpenExplorer, a platform for collaborative exploration. He is the author of the book “Zero to Maker” and writes frequently on the role of technology in empowering amateurs to contribute to science and discovery. He was named a TED fellow in 2013.

MEET OUR SPEAKERS.



ALAN P. LEONARDI

Director / NOAA Office of Ocean Exploration and Research

Alan Leonard leads a team responsible for providing direction to NOAA and the U.S. Department of Commerce in the field of ocean exploration, research and advanced technology development. A key element of the Office of Ocean Exploration and Research's portfolio is the expeditionary exploration activities, which combine the NOAA ship *Okeanos Explorer* and high-speed networks and infrastructure for live communications—including high-definition video of the seafloor—to scientists and other audiences ashore. It is the only federal program dedicated to systematic, telepresence-enabled exploration of the world's ocean.

A meteorologist and oceanographer, Leonard has been with NOAA since 2003. Previous roles include coordinator for NOAA's Environmental Modeling Program; environmental modeling program manager for NOAA's Office of Oceanic and Atmospheric Research; deputy director of policy, planning and evaluation within OAR headquarters; and deputy director of NOAA's Atlantic Oceanographic and Meteorological Laboratory.

He earned his undergraduate degree in meteorology from the University of Wisconsin, and his master's and doctorate degrees in physical oceanography from Florida State University.

Leonardi was awarded the DOC Silver Medal for his leadership efforts fostering a partnership with Google on the development and deployment of NOAA data and information in Google's popular Google Earth platform.



DAVE LOALVO

President / Global Foundation for Ocean Exploration

Dave Loalvo has been working in ocean science and exploration for more than 35 years, documenting and supporting underwater research projects in just about every major ocean and many of the world's major inland lakes. He has spent 28 years exploring, filming and mapping Yellowstone Lake and continues to support projects in Yellowstone and many other locations around the world. He has been an engineering consultant to Woods Hole Oceanographic Institution, where he was certified by the Navy to pilot the National Deep Submergence-manned submersible *Alvin*.

Loalvo is part of the original team hired by NOAA's Office of Ocean Exploration and Research to plan and outfit the exploration ship *Okeanos Explorer*. For the last seven years, he has been the technical director of deep-submergence operations for the Ocean Exploration Program.

Loalvo has explored and documented some of the most exciting underwater thermal features in the world. He was part of a team that built and installed HydroLab, one of the first underwater habitats for science, and was one of the chief pilots on expeditions to film the RMS *Titanic* and locate John F. Kennedy's PT109 in the Solomon Islands.

MEET OUR SPEAKERS.



CRAIG MCLEAN

Assistant Administrator | NOAA Office of Oceanic and Atmospheric Research

Craig McLean is responsible for daily operations and administration of NOAA's research enterprise and the execution of NOAA programs, including the Climate program, National Sea Grant and Ocean Exploration.

He has previously served as executive officer of the National Ocean Service and was the founding director of NOAA's Office of Ocean Exploration. McLean retired from NOAA's Commissioned Corps in the grade of captain after 25 years of service at sea, underwater and in operational, legal and marine resource management positions.

A lifelong diver, he has searched for freshwater dolphins in the Amazon River and explored the RMS *Titanic* while searching for solutions in shipwreck management. McLean is also an attorney and has practiced marine resource law for NOAA. He has been awarded the Departmental Silver and Bronze Medals, the NOAA Corps Commendation Medal and Special Achievement Medal, and was recognized as the NOAA 2005 Senior Leader of the Year. He is a fellow in the Explorers Club, chairman of the Marine Law and Policy Committee of the Marine Technology Society and is chairman of the board of the Sea-Space Symposium.



JERRY MILLER *(Moderator)*

Director of Science and Technology for Sustainability Program | National Research Council

A senior executive with expertise in science and resource management policy, Jerry Miller is the National Academies of Sciences, Engineering and Medicine's senior scientist driving policy and program direction on sustainability-related issues.

Previously, he served as president of Science for Decisions, a consulting practice that he founded to ensure that solid science is available to inform policy and management decisions that impact natural resources and the livelihoods that depend upon them.

From 2009 until 2013, Miller served as assistant director for ocean sciences at the White House Office of Science and Technology Policy. He was instrumental in the creation of the nation's first National Ocean Policy and the development of its foundational science priorities. Miller was founding co-director of the National Ocean Council Office and later served as its deputy director for science and technology.

Miller's work has been recognized with awards both in the U.S. and abroad, including with a Distinguished Career Achievement Award from the University of Rhode Island. He received his bachelor's in marine science from University of South Carolina, his master's in oceanography from University of Rhode Island and his Ph.D. in meteorology and physical oceanography from University of Miami.

MEET OUR SPEAKERS.



SHIRLEY POMPONI

*Research Professor and Executive Director
/ NOAA Cooperative Institute for Ocean
Exploration, Research and Technology*

Pomponi is the research professor and executive director of the NOAA Cooperative Institute for Ocean Exploration, Research and Technology at Harbor Branch Oceanographic Institute, Florida Atlantic University, in Fort Pierce, Florida.

She received her Ph.D. in biological oceanography from the University of Miami. Her research focuses on marine biotechnology—particularly sponge systematics and cell and molecular biology.

Pomponi has authored or co-authored more than 100 peer-reviewed scientific publications and is co-inventor on several patents. She has led numerous research expeditions worldwide and made more than 300 dives in Harbor Branch's Johnson-Sea-Link submersibles.

Pomponi is immediate past-president of the Southern Association of Marine Laboratories and immediate past-chair of the Florida Institute of Oceanography Council. She is a member of the Florida Oceans and Coastal Council, the U.S. National Committee for the Census of Marine Life, the National Association of Marine Laboratories and the Southeast Coastal Ocean Observing Regional Association.



JOHN C. RACANELLI

(Forum Chair, Moderator)

CEO | National Aquarium

John Racanelli leads a team of 600 full- and part-time employees and 1,000 volunteers in pursuing the Aquarium's mission to inspire conservation of the world's aquatic treasures. The Aquarium welcomes 1.3 million guests annually at its campus on Baltimore's famous Inner Harbor, while touching millions more through its conservation-education and engagement programs, social media platforms and conservation-action initiatives.

Racanelli joined the National Aquarium in July 2011 after 10 years as president of a San Francisco-based consulting firm that he founded to provide expert counsel to nonprofit leaders nationally and globally. His firm worked with over 30 leading cultural and conservation organizations—among them the Sylvia Earle Alliance/Mission Blue, International Union for the Conservation of Nature and Surfrider Foundation—as well as technology giant Google, where he assisted Sylvia Earle in bringing the ocean into Google Earth.

Prior to this, Racanelli spent 16 years in leadership positions at U.S. aquariums. He was the first CEO of the Florida Aquarium in Tampa and served as Monterey Bay Aquarium's vice president of marketing and development for nine years.

Racanelli holds a degree in strategic management from the Dominican University of California.

MEET OUR SPEAKERS.



PHILIP RENAUD

Executive Director | Khaled bin Sultan Living Oceans Foundation

Philip Renaud's career in oceanography began at the Naval Academy, where he earned a Bachelor of Science in oceanography in 1979. During his distinguished 25-year career in the Navy, he served as the oceanographer for an aircraft carrier (USS *Theodore Roosevelt*); was the lead oceanographer for the commander, second fleet; and his naval career culminated as the commanding officer of the Naval Oceanographic Office. His naval career took him to all corners of the Earth.

Renaud has earned master's degrees in oceanography, meteorology, strategic studies and business administration. He has been leading the Khaled bin Sultan Living Oceans Foundation for the past decade and has developed the foundation into a world-class scientific organization dedicated to conservation of the marine environment, particularly coral reef ecosystems.

Presently, Renaud is concentrating on fulfilling Prince Khaled's vision of circumnavigating the globe to combat the rapid decline in coral reef health through the foundation's ambitious Global Reef Expedition program. This fast-paced expedition is achieving the goals of mapping and surveying coral reefs around the world to rapidly close scientific knowledge gaps and to identify factors that either harm reefs or contribute to their resilience.



JERRY R. SCHUBEL

President and CEO | Aquarium of the Pacific

Jerry Schubel has been president and CEO of the Aquarium of the Pacific since 2002. He is president and CEO Emeritus of the New England Aquarium, and from 1974 to 1994 was dean of Stony Brook University's Marine Sciences Research Center.

He holds a Ph.D. in oceanography from Johns Hopkins University and received an honorary doctorate from the Massachusetts Maritime Academy in 1998.

Schubel has worked throughout his professional life at the interfaces of science and management policy on issues dealing with the ocean with an emphasis on the coastal ocean. He has published more than 225 scientific papers and has written extensively for general audiences.

Schubel is a member of NOAA's Science Advisory Board and the Science Advisory Team for California's Ocean Protection Council. He also chaired the National Sea Grant Review Panel; the National Research Council Marine Board and the NRC Committee on the St. Lawrence Seaway, the Ocean Research and Resources Advisory Panel, among others.

At the Aquarium of the Pacific, Schubel created the Aquatic Forum that brings together scientists, policy-makers and stakeholders to explore alternative ways of dealing with important and often controversial environmental issues facing the nation.

MEET OUR SPEAKERS.



REAR ADMIRAL DAVID SCORE

*Director / NOAA Commissioned Officer Corps
Director / NOAA Office of Marine and
Aviation Operations*

Rear Admiral David Score is responsible for the safe, efficient and effective operation of NOAA's fleet of research and survey ships and aircraft, as well as guiding the 321 commissioned NOAA officers and approximately 1,000 civilian personnel assigned to OMAO.

Rear Admiral Score previously served as deputy director of the NOAA Corps and as OMAO's deputy director for operations. Earlier assignments include director of OMAO's Marine Operations Centers, which oversees all NOAA ship operations, and commanding officer of the NOAA Marine Operations Center-Atlantic in Norfolk, Virginia.

Before directing NOAA's Atlantic fleet, Rear Admiral Score commanded NOAA ship *Gordon Gunter*, which conducted key research missions during the BP Deepwater Horizon oil-spill response. Since his commission as a NOAA Corps officer in 1990, Score has served aboard six NOAA vessels, including NOAA ships *Miller Freeman*, *Ferrel*, *Nancy Foster* and *Gordon Gunter*. These ships conducted diverse operations from the Bering Sea to the Caribbean Sea.

Rear Admiral Score has received two Department of Commerce Bronze Medals, two NOAA Corps Commendation Medals and eight NOAA Corps Achievement Medals. He holds a bachelor's degree in marine biology and advanced research from the Florida Institute of Technology and studied biology at Georgia Southern University.



ELLEN STOFAN *(Keynote Speaker)*

Chief Scientist / NASA

Ellen Stofan serves as principal adviser to NASA Administrator Charles Bolden on the agency's science programs and science-related strategic planning and investments.

Prior to her appointment, Stofan was vice president of Proxemy Research and honorary professor in the department of earth sciences at University College London. Her research has focused on the geology of Venus; Mars; Saturn's moon, Titan; and Earth.

Stofan is an associate member of the Cassini Mission to Saturn Radar Team and a co-investigator on the Mars Express Mission's MARSIS sounder. She also was principal investigator on the Titan Mare Explorer, a proposed mission to send a floating lander to a sea on Titan.

From 1991 through 2000, Stofan held a number of senior scientist positions at NASA's Jet Propulsion Laboratory, including chief scientist for NASA's New Millennium Program, deputy project scientist for the Magellan Mission to Venus and experiment scientist for SIR-C.

Stofan holds master's and doctorate degrees in geological sciences from Brown University and a bachelor's degree from the College of William and Mary. She has received many awards and honors, including the Presidential Early Career Award for Scientists and Engineers.

MEET OUR SPEAKERS.



MARY A. VOYTEK

Senior Scientist for Astrobiology | NASA

Mary A. Voytek took charge of NASA's Astrobiology Program on September 15, 2008, as senior scientist for astrobiology in the Science Mission Directorate at NASA headquarters. Voytek came to NASA from the U.S. Geological Survey in Reston, Virginia, where she headed the USGS Microbiology and Molecular Ecology Laboratory.

Voytek's primary research interest is aquatic microbial ecology and biogeochemistry. She has studied environmental controls on microbial transformations of nutrients, xenobiotics and metals in freshwater and marine systems. She has worked in several extreme environments, including Antarctica, the Arctic, hypersaline lakes, deep-sea hydrothermal vents and terrestrial deep-subsurface sites.

Voytek has served on several advisory groups to the Department of the Interior, Department of Energy, the National Science Foundation and NASA, including the Planetary Protection Subcommittee. She has also supported NASA's Astrobiology Program, serving as a NASA representative to a number of COSPAR convened studies exploring the potential for life in the universe. She has held positions in several science societies and is currently a board member of the American Geophysical Union.

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