

A composite space image featuring Earth in the upper left, the Moon in the center, Mars in the lower center, Jupiter in the lower right, a comet streaking across the upper right, a satellite orbiting Earth, and a galaxy in the top right corner.

**NASA Science Mission Directorate
Earth Science Division**

NRC Decadal Survey 2017

**Woody Turner
Earth Science Division
NASA Headquarters (with thanks to NASA/Ken Jucks
for most of these slides)
October 18, 2016**



Survey Status

- NRC Approval, May 6, 2015
- Chairs, steering committee, and 5 panels named
- 1st round of white papers for science topics submitted, which helped define committees
- 2nd round of white papers submitted (>150 received)
- NASA HQ are not to be part of this process.
- NRC Boards covering atmospheric sciences, polar research, ocean science, hydrology, and the solid Earth will be collaborating partners with the Space Studies Board
 - Includes membership, execution, staffing, etc.
- Final report due ~ 2 years from survey start (Mid 2017)



Decadal Survey Steering Committee

Waleed Abdalati, *Co-Chair*, University of Colorado, Boulder

William Gail, *Co-Chair*, Global Weather Corporation

Steven Battel (NAE), Battel Engineering

Stacey Boland, Jet Propulsion Laboratory

Robert Braun (NAE), Georgia Institute of Technology

Shuyi Chen, University of Miami

William Dietrich (NAS), University of California, Berkeley

Scott Doney, Woods Hole Oceanographic Institution

Christopher Field (NAS), Carnegie Institution for Science

Helen Fricker, Scripps Institution of Oceanography

Sarah Gille, Scripps Institution of Oceanography

Dennis Hartmann (NAS), University of Washington

Daniel Jacob, Harvard University

Anthony Janetos, Boston University

Everette Joseph, University at Albany, SUNY

Joyce Penner, University of Michigan

Soroosh Sorooshian (NAE), University of California, Irvine

Graeme Stephens (NAE), California Institute of Technology

Byron Tapley (NAE), University of Texas at Austin

W. Stanley Wilson, NOAA/NESDIS (retired)





Decadal Survey Panels

- I. Global Hydrological Cycles and Water Resources
- II. Weather and Air Quality: Minutes to Subseasonal
- III. Marine and Terrestrial Ecosystems and Natural Resource Management
- IV. Climate Variability and Change: Seasonal to Centennial
- V. Earth Surface and Interior: Dynamics and Hazards



Panel I Members

Global Hydrological Cycles and Water Resources

- Dr. Ana P. Barros - (Co-Chair), Duke University
- Dr. Jeff Dozier - (Co-Chair), University of California, Santa Barbara
- Dr. Newsha Ajami, Stanford University
- Dr. John D. Bolten, NASA Goddard Space Flight Center
- Dr. Dara Entekhabi, Massachusetts Institute of Technology
- Dr. Graham E. Fogg, University of California, Davis
- Dr. Efi Foufoula-Georgiou, University of Minnesota
- Dr. David C. Goodrich, U.S. Department of Agriculture
- Dr. Terri S. Hogue, Colorado School of Mines
- Dr. Jeffrey S. Kargel, University of Arizona
- Dr. Venkat Lakshmi, University of South Carolina
- Professor Andrea Rinaldo, Ecole Polytechnique Federale de Lausanne
- Dr. Edwin Welles, Deltares
- Professor Eric F. Wood, Princeton University



Panel II Members

Weather and Air Quality: Minutes to Subseasonal

- Dr. Steven A. Ackerman - (Co-Chair), University of Wisconsin-Madison
- Dr. Nancy L. Baker - (Co-Chair), Naval Research Laboratory
- Dr. Philip E. Ardanuy, INNOVIM, LLC
- Dr. Elizabeth A. Barnes, Colorado State University
- Dr. Stanley G. Benjamin, National Oceanic and Atmospheric Administration
- Dr. Mark A. Bourassa, Florida State University
- Dr. Bryan N. Duncan, NASA Goddard Space Flight Center
- Dr. Charles E. Kolb, Aerodyne Research, Inc.
- Dr. Ying-Hwa Kuo, University Corporation for Atmospheric Research
- Dr. W. Paul Menzel, University of Wisconsin-Madison
- Ms. Maria A. Pirone, Harris Corporation
- Dr. Armistead G. Russell, Georgia Institute of Technology
- Ms. Julie O. Thomas, Scripps Institution of Oceanography UCSD
- Dr. Duane Waliser, California Institute of Technology
- Dr. Xubin Zeng, University of Arizona



Panel III Members

Marine and Terrestrial Ecosystems and Natural Resource Management

- Dr. Compton J. Tucker - (Co-Chair), NASA Goddard Space Flight Center
- Dr. James A. Yoder - (Co-Chair), Woods Hole Oceanographic Institution
- Dr. Gregory P. Asner, Carnegie Institution for Science
- Dr. Francisco Chavez, Monterey Bay Aquarium Research Institute
- Dr. Scott Goetz, Woods Hole Research Center (soon N. Arizona)
- Dr. Patrick N. Halpin, Duke University
- Dr. Eric Hochberg, Bermuda Institute of Ocean Sciences
- Dr. Christian J. Johannsen, Purdue University
- Dr. Raphael M. Kudela, University of California, Santa Cruz
- Dr. Gregory W. McCarty, U.S. Department of Agriculture
- Dr. Linda O. Mearns, National Center for Atmospheric Research
- Dr. Mary Jane Perry, University of Maine
- Dr. David A. Siegel, University of California, Santa Barbara
- Dr. David L. Skole, Michigan State University
- Dr. Susan L. Ustin, University of California, Davis
- Dr. Cara Wilson, National Oceanic and Atmospheric Administration



Panel IV Members

Climate Variability and Change: Seasonal to Centennial

- Dr. Carol Anne Clayson (Co-Chair), Woods Hole Oceanographic Institution
- Dr. Venkatachalam Ramaswamy (Co-Chair), NOAA GFDL
- Dr. Arlyn E. Andrews, NOAA Earth System Research Laboratory
- Dr. Enrique Curchitser, Rutgers University
- Dr. Lee-Lueng Fu, Jet Propulsion Laboratory
- Dr. Guido Grosse, Alfred-Wegener-Institute for Polar and Marine
- Dr. Randal D. Koster, NASA Goddard Space Flight Center
- Dr. Sonia Kreidenweis, Colorado State University
- Dr. Emilio F. Moran, Michigan State University
- Dr. Cora E. Randall, University of Colorado
- Dr. Philip J. Rasch, Pacific Northwest National Laboratory
- Dr. Eric J. Rignot, University of California, Irvine
- Dr. Christopher Ruf, University of Michigan
- Dr. Ross J. Salawitch, University of Maryland
- Dr. Amy K. Snover, University of Washington
- Julienne C. Stroeve, University of Colorado Boulder
- Dr. Bruce A. Wielicki, NASA Langley Research Center
- Dr. Gary W. Yohe, Wesleyan University



Panel V Members

Earth Surface and Interior: Dynamics and Hazards

- Douglas W. Burbank, NAS (Co-Chair) University of California, Santa Barbara
- David T. Sandwell, NAS (Co-Chair) Scripps Institution of Oceanography
- Robin E. Bell, Columbia University
- Emily E. Brodsky, University of California, Santa Cruz
- Donald P. Chambers, University of South Florida, St. Petersburg
- Lucy Flesch, Purdue University
- George E. Hilley, Stanford University
- Kristine M. Larson, University of Colorado Boulder
- Stefan Maus, University of Colorado Boulder
- Michael S. Ramsey, University of Pittsburgh
- Jeanne Sauber, NASA Goddard Space Flight Center
- Khalid A. Soofi, ConocoPhillips
- Howard A. Zebker, Stanford University



HyspIRI RFI 2 Inputs

Luvall	Jeffrey	A Thermodynamic Paradigm For Using Satellite Based Geophysical Measurements For Public Health Applications
Heidi	Dierssen	Assessing Transient Threats and Disasters in the Coastal Zone with Airborne Portable Sensors
Ryan	Pavlick	Biodiversity
Simon	Hook	Carbon Emissions from Biomass Burning
Eric	Hochberg	Coral Reefs: Living on the Edge
Wendy	Calvin	Earth Surface Geochemistry and Mineralogy: Processes, Hazards, Soils, and Resources
Joshua	Fisher	Evapotranspiration: A Critical Variable Linking Ecosystem Functioning, Carbon and Climate Feedbacks, Agricultural Management, and Water Resources
Tamlin	Pavelsky	From the Mountains to the Sea: Interdisciplinary Science and Applications Driven by the Flow of Water, Sediment, and Carbon II
Philip	Dennison	Global Measurement of Non-Photosynthetic Vegetation
Kevin	Turpie	Global Observations of Coastal and Inland Aquatic Habitats
Philip	Townsend	Global Terrestrial Ecosystem Functioning and Biogeochemical Processes
Dale	Quattrochi	High Spatial, Temporal, and Spectral Resolution Instrument for Modeling/Monitoring Land Cover, Biophysical, and Societal Changes in Urban Environments
Steve	Greb	Inland Waters
Natalie	Mahowald	Measuring the Earth's Surface Mineral Dust Source Composition for Radiative Forcing and Related Earth System Impacts
Frank	Muller-Karger	Monitoring Coastal and Wetland Biodiversity from Space
Robert	Wright	Predicting Changes in the Behavior of Erupting Volcanoes, and Reducing the Uncertainties Associated with their Impact on Society and the Environment
Robert	Green	Science and Application Targets Addressed with the 2007 Decadal Survey HySpIRI Mission Current Baseline
Natasha	Stavros	The role of fire in the Earth System
Riley	Duren	Understanding anthropogenic methane and carbon dioxide point source emissions
Thomas	Painter	Understanding the controls on cryospheric albedo, energy balance, and melting in a changing world



Request for Community Town Halls

The decadal survey steering committee encourages interested members of the community to consider organizing a **town hall meeting** at their institution that would provide a local forum for colleagues to discuss and consider any aspect of the survey. Organizers should feel free to focus town hall meetings on any aspects of the survey they think are important, such as key science opportunities in the decade ahead, how Earth system science can continue to provide knowledge important to key societal challenges, and the role of technology development and other forms of innovation in the execution of our science.





Thank You

