

The National Academies of
SCIENCES • ENGINEERING • MEDICINE

Workshop on Evolving the Geodetic Infrastructure to Meet New Scientific Needs

Beckman Center, Huntington Room
100 Academy Way, Irvine, California
February 11-12, 2019

Preliminary Agenda

Goals

1. Address Task 3:

Task 3. Discuss the elements of selected science questions that drive future requirements for the terrestrial reference frame, Earth-orientation parameters, and satellite orbits, and identify what geodetic infrastructure changes are needed to help answer the questions.

2. Heighten community awareness of the role of geodesy in earth science.

Monday, February 11

7:00 Shuttle leaves Hyatt Newport Beach hotel to travel to the Beckman Center

7:15 Breakfast at Beckman Center

8:00 Session 1. Context for the Workshop Huntington Room

8:00 Welcome and overview of the study *Dave Sandwell, chair*

8:15 NASA interests in the study and workshop

- Motivations and hoped for outcomes
- Components of the geodetic infrastructure

Ben Phillips, Lead, Earth Surface and Interior Focus Area

8:40 Thriving on Our Changing Planet: A Decadal Strategy for Earth Observation from Space (NASEM, 2018)

- Science questions and their geodetic requirements

Dave Sandwell, Scripps Institution of Oceanography

9:00 Session 2. Connections Between Science Questions and the Geodetic infrastructure

9:00 Sea-Level Rise: How much will sea level rise, globally and regionally, over the next decade and beyond, and what will be the role of ice sheets and ocean heat storage? How will local sea level change along coastlines around the world in the next decade to century?

Steve Nerem, University of Colorado; John Ries, University of Texas; and Mark Tamisiea, University of Texas

9:35 Water Cycle: How does the water cycle interact with other Earth System processes to change the predictability and impacts of hazardous events and hazard-chains (e.g. floods, wildfires, landslides, coastal loss, subsidence, droughts, human health, and ecosystem health), and how do we improve preparedness and mitigation of water-related extreme events?

Don Argus, Jet Propulsion Laboratory, and Bruce Haines, Jet Propulsion Laboratory

10:00 Ecosystems: What are the structure, function, and biodiversity of Earth's ecosystems, and how and why are they changing in time and space?

Erika Podest, Jet Propulsion Laboratory, and Frank Lemoine, Goddard Space Flight Center

10:25 Break

10:45 Weather/Atmosphere: How can we reduce the uncertainty in the amount of future warming of the Earth as a function of fossil fuel emissions, improve our ability to predict local and regional climate response to natural and anthropogenic forcings, and reduce the uncertainty in global climate sensitivity that drives uncertainty in future economic impacts and mitigation/ adaptation strategies?

Yolande Serra, University of Washington, and Pedro Elosegui, Haystack Observatory, with contributions from John Braun, University Corporation for Atmospheric Research

11:10 Session 3. Working Groups

Instructions for the working groups

Dave Sandwell

- Choose what aspect(s) of the science questions/objectives to focus on

11:20 Break into 4 working groups:

Weather/atmosphere, Crystal Cove Room

Chair and rapporteur TBA

Water cycle, Laguna Room

Chair and rapporteur TBA

Ecosystems, Emerald Bay Room

Chair and rapporteur TBA

Sea level rise, Back Bay Room

Chair and rapporteur TBA

12:00 Working lunch, Beckman Center Cafeteria

- Working groups define scope or raise questions or problems

1:00 Working groups resume (address Task 3)

- How the science question drives future needs for ground networks, data processing, on orbit requirements, and space-based approaches
- Tools needed to fully answer the questions (e.g., simulation capabilities to quantitatively assess the impact of reference frame improvements)

4:30 Session 4. Preliminary Reports From Working Groups Huntington Room

4:30 Reports on progress (10 minutes each)

Weather/atmosphere *Rapporteur TBA*

Water cycle *Rapporteur TBA*

Ecosystems *Rapporteur TBA*

Sea level rise *Rapporteur TBA*

5:30 Adjourn to reception

5:30-7:30 Reception (beer, wine, heavy hors d'oeuvres), Beckman Center

7:30 Shuttle leaves Beckman Center to travel to the Hyatt Newport Beach hotel

Tuesday, February 12

7:00 Shuttle leaves Hyatt Newport Beach hotel to travel to the Beckman Center

7:15 Breakfast at Beckman Center

8:00 Session 5. Emerging Technologies Huntington Room

8:00 Emerging technologies that could influence approaches to the Decadal Survey questions

Jake Griffiths, Naval Research Laboratory

8:20 Session 6. Working Groups

8:20 Instructions to the working groups

Dave Sandwell

8:30 Working groups resume

Weather/atmosphere, Crystal Cove Room

Water cycle, Laguna Room

Ecosystems, Emerald Bay Room

Sea level rise, Back Bay Room

12:00 Working lunch

Working groups complete discussions and prepare reports

2:00 Session 7. Final Reports from Working Groups Huntington Room

2:00 Conclusions (15 minutes each)

Weather/atmosphere *Rapporteur TBA*

Water cycle *Rapporteur TBA*

Ecosystems *Rapporteur TBA*

Sea level rise *Rapporteur TBA*

Discussion

4:00 Workshop adjourns

4:30 Shuttle leaves Beckman Center to travel to the Hyatt Newport Beach hotel