Wrap Up of 2014 NASA Ocean Color Research Team Meeting

Paula Bontempi and Kathy Tedesco
NASA Headquarters
NASA Ocean Color Research Team Meeting
5-7 May 2014
Washington, DC
Announcements

• **Speakers** – talks will be posted on the ocean color website, so please submit a copy in the folder on the Desktop (NASA OCRT 2014). Please remember to remove any material you do not want posted.

• **HICO Science Team Meeting 7-8 May** – Cedar Room beginning at 1300 today

• **Biodiversity and Ecological Forecasting Team Meeting 7-9 May** – beginning at 1330 today in Cypress Ballroom (here)

• Thank you to all speakers, poster presenters, and attendees
PACE Mission – ESD Path Forward

• Federal budget guidance urged NASA to work to a launch date as early as 2018
• NASA will complete and announce the agency implementation plan for PACE
  • Will include the approach for the mission, the instruments, the mission science, the calibration and validation elements
  • As a general rule within the SMD competition is preferred

• In FY2014 NASA will accomplish the following:
  • Risk reduction and formulation studies to support the earliest possible launch date
  • Release of an ocean color vicarious calibration approach and instrumentation competition through ROSES
  • Complete the PACE mission Science Team (ST) selection
  • Finalize the mission acquisition approach, including defining the baseline mission science objectives
  • Initiate the PACE project line, including release of all necessary solicitations – Target date for a PACE AO in Q2 FY2015 (Jan – Mar 2015) on the SMD solicitation calendar that appears on the NASA website
Field Campaign Planning – How to Participate

• Impacts of Climate on the Eco-Systems and Chemistry of the Arctic Pacific Environment (ICESCAPE) Synthesis – in synthesis phase, one special issue of DSR in press, another planned for this year

• EXport Processes in the Ocean from Remote Sensing (EXPORTS) - Introducing a Science Plan for a NASA Field Campaign on the Ocean's Biological Pump – D. Siegel/Univ. of California – Santa Barbara – delivery of Strategic Plan in June, to be posted on the CC&E web site and open for public comments for 60d
  • Peer review panel, competed SDT for an Implementation Plan (TBD)

• Two field campaign scoping proposals selected in ROSES 2013 A.3 OBB:
  • Scoping for Interdisciplinary Coordinated Experiment of the Southern Ocean Carbon Cycle (ICESOCC) – G. Mitchell/University of California – San Diego – SIO
  • Arctic COastal Land Ocean InteRactions Scoping Study (Arctic-COLORS) – A. Mannino, NASA GSFC

• Both of these will be 18-months to delivery of a draft Strategic Plan
Beyond PACE: Advanced Planning for Ocean Biology and Biogeochemistry (led by Carlos DelCastillo)

- Evolution of the Science in the 2007 NASA OBB Advance Plan
- Preparation for the next NRC Decadal Survey (to be delivered in 2017)


Emerging Science Questions (2007):

- How are ocean ecosystems and the biodiversity they support influenced by climate and environmental variability and change, and how will these changes occur over time?

- How do carbon and other elements transition between ocean pools and pass through the Earth System, and how do biogeochemical fluxes impact the ocean and Earth's climate over time?

- How (and why) is the diversity and geographical distribution of coastal marine habitats changing, and what are the implications for the well-being of human society?

- How do hazards and pollutants impact the hydrography and biology of the coastal zone? How do they affect us, and can we mitigate their effects?
<table>
<thead>
<tr>
<th>Mission Themes</th>
<th>Immediate (1 – 5 Years)</th>
<th>Near-Term (5 - 10 Years)</th>
<th>Long-Term (10 - 25 Years)</th>
<th>Ecosystems</th>
<th>Biogeochemistry</th>
<th>Habitats</th>
<th>Hazards</th>
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<tbody>
<tr>
<td>Global Separation of In-water Constituents &amp; Advanced Atmospheric correction</td>
<td>Advanced radiometer &amp; scattering lidar • 5nm resolution from UV through visible • Ozone &amp; extended NIR atmosphere bands • Atmosphere &amp; subsurface particle scattering profiles</td>
<td>Ocean radiance and atmosphere aerosols • Advanced radiometer • Scattering lidar for aerosol speciation • Polarimeter for global aerosol coverage • 500 m passive resolution</td>
<td>Radiometry, aerosols, and physiology lidar • Global radiometry system • Aerosol height &amp; species • Midnight/noon obs of variable stimulated fluorescence</td>
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<td>High Spatial &amp; Temporal Resolution Coastal</td>
<td>GEO partnership Support analysis of current satellite data Lansat DCM partnership Development of suborbital sensor systems</td>
<td>High-res coastal imager • 20 bands from UV - NIR • 10 m res – 100 km swath GEO carbon mission Deployment of suborbital systems</td>
<td>Constellation of imaging spectrometers • High temporal res • LEO, MEO or GEO • Include SAR Continued deployment of suborbital systems</td>
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<tr>
<td>Plant Physiology &amp; Functional Composition</td>
<td>Support analysis of global passive data • Assess functional groups using hyperspectral data • Estimate algal carbon &amp; chlorophyll to characterize physiology</td>
<td>Support analysis of global &amp; GEO data</td>
<td>Variable fluorescence lidar constellation • Map physiological provinces at different times of day • Dawn/dusk variable fluorescence lidar • Noon/midnight lidar</td>
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<td>Mixed Layer Depth</td>
<td>Synthesis/analysis of observational forecast fields &amp; on orbit remote sensing Mixed layer model development</td>
<td>Prototype mixed layer sensor development • field testing of novel approaches for remote detection of mixed layer depth &amp; light availability</td>
<td>Mixed layer depth mission • Space-borne proof-of-concept mission for global mixed layer depth mapping</td>
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Bold Green Text Represents Satellite Missions
Bold Blue Text Represents Development Activities leading to Missions
Cross-hatch indicates secondary contribution to Mission Theme
• Global separation of in-water constituents and advanced atmospheric corrections
• High temporal and spatial resolution coastal measurements
• Active assessments of plant physiology and functional composition
• Mixed layer depth
Science Requirements Lead to Observational Strategies

- Global Hyperspectral Imaging Radiometer
- Geostationary Hyperspectral Imaging Radiometer(s)
- Multi-Spectral High Spatial Resolution Imager
- Portable Sensors from Suborbital Platforms
- Variable Fluorescence Lidar
- Mixed Layer Depth and Illumination Sensor
- Ocean Particle Profiler and Aerosol Column Distributions
Science Requirements Lead to Observational Strategies

• Global Hyperspectral Imaging Radiometer
  – Aerosol-Ocean-Cloud (polarimeter, lidar, ocean radiometer, radar)
• Geostationary Hyperspectral Imaging Radiometer(s)
• Multi-Spectral High Spatial Resolution Imager
  – Plant Physiology and Functional Types
• Portable Sensors from Suborbital Platforms
• Variable Fluorescence Lidar
• Mixed Layer Depth and Illumination Sensor
• Ocean Particle Profiler and Aerosol Column Distributions
• Beyond PACE: Advanced Planning for Ocean Biology and Biogeochemistry (led by Carlos DelCastillo)
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• How do hazards and pollutants impact the hydrography and biology of the coastal zone? How do they affect us, and can we mitigate their effects?
Ocean Biology and Biogeochemistry Science and Mission Advanced Planning

- Beyond PACE: Advanced Planning for Ocean Biology and Biogeochemistry (led by Carlos DelCastillo)
  - Evolution of the Science in the 2007 NASA OBB Advance Plan
  - Preparation for the next NRC Decadal Survey (to be delivered in 2017)

- Evolution of IMBER and Planning for FutureEarth (E. Hofmann)

- A Planning Workshop for an International Research Program on the Coupled North Atlantic-Arctic System (E. Hofmann)

- Surface Ocean Lower Atmosphere Study (SOLAS) Update – B. Miller

- Arctic Productivity Round Robin – P. Matrai /Bigelow Laboratory for Ocean Sciences

• ROSES 2013 - http://nspires.nasaprs.com/ - Released 14 February 2013
  • NASA Data for Operation and Assessment – Competed every two years, is there a need for 
    the ecological forecasting portion?
  • The Science of Terra and Aqua & Terra and Aqua – Algorithms – Existing Data Products
    – front-loaded selection
  • Carbon Cycle Science – expect new awards on Terra and Aqua and Carbon Cycle to begin 
    negotiations this month
  • Suomi National Polar-orbiting Partnership (NPP) Science Team and Science Investigator-
    led Processing Systems for Earth System Data Records From Suomi NPP Products ~ 
    Science Team; SIPS – 119 proposals – review underway (July/Aug decisions)
  • Pre-Aerosol, Cloud, ocean Ecosystem Science Team - 49 proposals – review underway 
    (target June/July decisions) – likely to start w/FY15 funds
  • A.3 Ocean Biology and Biogeochemistry Ocean Color Remote Sensing Vicarious (In Situ) Calibration Instruments - $5.0M/yr for YR1, $5M/Yrs 2+3 combined
  • New (Early Career) Investigator Program In Earth Science (NIP) [every 1-2 yrs, not in ROSES 2014]
    • Outstanding scientific research and career development of scientists and engineers at the early stage of their professional careers
• NASA EARTH AND SPACE SCIENCE FELLOWSHIP (NESSF) PROGRAM 2014/2015 ACADEMIC YEAR – each fellowship ~$30K/yr [try to do annually]
  • Currently under review
• Topical Workshops, Symposia, Conferences – E.2 – (Max Bernstein, POC) – [rolling deadline]
  • Proposals for topical workshops, symposia, conferences, other scientific/technical meetings that advance the goals and objectives of Earth Science
  • Theoretical algorithm advances
  • Data Fusion
  • Advanced Corrections
• USPI
  • Rapid Response and Novel Research in Earth Science – A.26 – (Diane Wickland, POC 2013, Tom Wagner POC 2014) [rolling deadline] - ROSES 2013, 17 proposals received, 4 selected; ROSES 2014 - 5 received, 1 selected - No budget for this –funded out of Core
  • immediate research activity to take advantage of a target of opportunity due to an unforeseen event in the Earth system, and
  • exceptionally novel and innovative ideas to advance Earth remote sensing that do not fit within ESD’s current slate of solicitations and or programs.
• 2.1 Targets of Opportunity: Rapid Response to Earth System Events and Opportunities to Collaborate (Rapid Response) - Research proposals having great urgency for action 1) involving quick-response research on natural or anthropogenic extreme events, disasters, and/or similar unanticipated or unpredictable events, and 2) requiring a quick funding decision to take advantage of an opportunity for research collaboration that is only available for a short time.
• 2.2 First-Time Development of Innovative, Novel Ideas in Earth Remote Sensing (Novel Earth Science) - proposals to conduct highly novel scientific research that cannot be considered as relevant under any other NASA solicitations. Research that is new and different: initial exploration of a novel idea or a first demonstration of new scientific use of remote sensing data or technology
• If there was an opportunity in the last three years that your work could have fit, do not bother submitting
• MUST talk with RRNES POC and program officer ahead of submission
International Ocean Color Science Team Meeting 2015

• Lessons learned from IOCST 2013 - [http://iocs.ioccg.org/](http://iocs.ioccg.org/)
  • Format?
  • Topics?
  • Splinter Sessions:
    • NASA Ocean Colour Research Team (OCRT) Meeting
    • Advances in Atmospheric Correction of Satellite Ocean-Color Imagery
    • Geostationary Ocean Colour Radiometry
    • Multi-Agency Data Sharing (Satellite and In Situ Data)
    • Operational Ocean Colour Data in Support of Research, Applications and Services
    • *In situ* Measurement Protocol Revision for Cal/Val
    • International Training and Outreach
    • System Vicarious Calibration
    • Climate Variables and Long Term Trends
    • Phytoplankton Community Structure from Ocean Colour
    • Satellite Data File Formats and Tools for Easy Science Exploitation
    • Satellite Instrument Pre-and Post-Launch Calibration

• Reports and recommendations useful?
• Workshops to come out of the splinter session reports?
• CC&E Focus Area Meeting 20-24 April – DC area, venue search underway
Programmatic Last Thoughts

- Costing and Obligation – timely obligation and costing of funded projects (we lose funds due to uncosted carryover!)

- Reporting our accomplishments both within and outside the agency.
  - Copies of publications, ideally with an accompanying ppt slide(s) and narrative explaining the result(s) and scientific/societal significance

- Thank you to all who participate in science requirement development on missions (Decadal Survey and Climate Initiative)
  - ACE - SWG workshop 9-11 June in Washington, DC
  - HyspIRI-ASG Forum/Telecon planned for 6 June at GSFC HyspIRI Symposium to participate please contact kevin.r.turpie@nasa.gov

- Next OCRT Meeting is likely to be with CC&E Focus Area Meeting in week of 20 April 2014, but there will be an update at IOCST – 2015 in US

- Feedback on IOCST is needed and welcome

- PACE AO

- Future field campaigns and solicitations – look for posting of EXPORTS plan on CC&E web site, open public comment period