NASA Science Mission Directorate
Earth Science Division

Applications Activities for NASA Flight Missions

NASA Decadal Survey

Earth Science and Applications from Space: National Imperatives for the Next Decade and Beyond

- *However, the compelling need for measurements in support of human health and safety and for documenting, forecasting, and mitigating changes on Earth creates a continuum between science and applications—illustrating again the need for multiple agencies to be intimately involved in the development of Earth science and applications from space.*

- *These declarations, first made in the interim report of the Committee on Earth Science and Applications from Space: A Community Assessment and Strategy for the Future, are the foundation of the committee's vision for a decadal program of Earth science research and applications in support of society—a vision that includes advances in fundamental understanding of the Earth system and increased application of this understanding to serve the nation and the people of the world. The declarations call for a renewal of the national commitment to a program of Earth observations in which attention to securing practical benefits for humankind plays an equal role with the quest to acquire new knowledge about the Earth system.*

NASA Climate-Centric Architecture

- Responding to the Challenge of Climate and Environmental Change: NASA's Plan for a Climate-Centric Architecture for Earth Observations and Applications from Space
- *Complementing the flight portfolio expansion, NASA will advance climate research, multiply applications using the full set of available (NASA and non-NASA) satellite measurements for direct societal benefit, and develop / mature technologies required for the next generations of Earth observing missions.*
- *Most visibly, this architecture revitalizes the nation's research satellite system, providing near-term measurements to advance science, underpin policy, and expand applications and societal benefits.*

NASA ES AS Program Charge

- Promote innovative and practical uses of Earth science by public and private sector
- Engage applications-oriented users and organizations early in the satellite mission lifecycle
- Enable users to envision possible applications and integrate end-user needs into satellite mission planning as a way to increase the benefits to the nation.

Mission Applications aspects:

- Focus on early phase Decadal Survey missions
- Address applications science/data users
- HQ Applications POC for SWOT (Doorn) and Center (JPL) management – identified Applications Representatives for the missions.

Structure

Lawrence Friedl, SMD ES Applied Science Director

Bradley Doorn, GSFC, HQ

- Program Manager for Agriculture, Carbon & Water Resources applications areas in the NASA Earth Sciences Applied Science Directorate
- NASA Program Exec for SWOT Applications

Margaret Srinivasan, JPL

Craig Peterson, Stennis

- SWOT Mission Applications Representatives

SWOT Mission Applications

CAPT Craig A. Peterson, U.S. Navy (ret);

- NASA Applied Sciences and Technology Office – Stennis, (ASRC Research & Technology Solutions LLC)
- Project Manager for NASA's Applied Sciences Program, Gulf of Mexico Initiative (an AS capacity-building project, along w SERVIR & DEVELOP)
- Prior to NASA;
  - Director of Ocean Projects at the Naval Oceanographic Office
  - Chief of Operations at the Command, Naval Meteorology and Oceanography Command
  - Degrees: Master of Science in Oceanography, Bachelor's in Physics.

SWOT Mission Applications

HQ-Center MA Team Charge

Key Requirements:

- stay abreast of latest developments on the mission
- participate in telecons & major mission meetings
- provide quarterly updates on the applications-oriented aspects, concerns, and opportunities for the mission (e.g., what things could increase the applications utility of the mission, what are some needed initiatives).
- organize at least one meeting/event/workshop per year to help organize the applications community to imagine, identify, and anticipate applications from the mission (e.g., webinars, Facebook sites, side events & exhibit's at end-user's meetings, etc.).

HQ-Center MA Team Charge

Center Mission Applications Representatives *(Program level)*

Key Responsibilities:

- Work with the HQ Program Manager to represent Applications perspectives in the mission development and planning; help in support to PE & PS
- Participate in regular telecons and team meetings for the mission.
- Engage with the mission project and SDT/ST, with an emphasis on the applications and scientific aspects of the mission.
- Support Mission Project team to develop the applications dimension of mission
- **Organize the relevant applications communities on behalf of the mission** they represent. Support and facilitate organizations' and communities' efforts to imagine, articulate, and anticipate possible applications. Organize sufficient meetings/events/workshops to support and organize the applications communities for the mission. Identify studies.
- **Enhance the applications value of mission** and alert management to situations in which the applications value of the mission might increase/decrease

SWOT Mission Applications

Eric Ianson, Program Exec, NASA SMD - ESD

- It is essential for Applied Science to play a role EARLY in mission formulation (Pre-Phase A/Phase A), if it expects to have a significant role later in the mission.
- While Phases B and C have less of role for AS, there are many opportunities to stay engaged with a mission and sustain visibility for AS.
- Phase D is a critical time for outreach and external messaging. This is the time to integrate applications into stories on the mission.
- Phase E is where Applied Science is most visible. However, the more work done early on the stronger AS will be later in operations.

Funding

Center Representatives
LOE FTE
Travel to key meetings & conferences

Workshops
Available from Applied Sciences
Joint workshops across two or multiple missions is encouraged.

Studies
Available from Earth Science Division
- First step is to go to Applied Sciences & HQ Program Manager
- The Program Manager will work with PE & PS to identify study funding balance
- Feasibility studies, air campaigns (ie, funding a grad student)

Objectives

Instruct and discover how Mission Teams can:

1) Integrate applied science and applications perspectives within the NASA satellite mission planning process and

2) Enable users to imagine and anticipate possible applications early in satellite mission lifecycles and facilitate effective ways to integrate end-user needs into satellite mission planning.

Workshop discussions to brainstorm and determine methods (strategic and tactical) to engage applications communities and to engage with mission/science teams.

In addition, the workshop is a chance to work out logistics between HQ Program Manager and Center representatives on coordination, support, leadership, etc. on the respective missions.

Actions and Follow Up

1) White paper

2) Mission Applications Plan (SMAP example)

2) Work with Airborne Sciences Program on engagement on applications assessments

3) Examine ROSES call for new, applications-oriented data products for existing missions (get experience engaging users on developing Level 3, 4, 5 products – information might help us with arguments in pre-phase A)

4) Organization (univ or priv sector) to support assessments of potential applications and communities

5) Early adopters

SWOT Project Benefits

- Strong applications focus exists
- Funding for application-related elements: web site, FTE, products, enhanced user interface
- Feasibility studies, AirSWOT-related studies (pre/post), data/modeling studies that enhance potential applications/uses

SWOT Mission Applications

Thank you

White Paper – General Purpose

- Why - outline the need for applied science community of practice to be a part of the flight mission development life cycle from its inception through launch and operations.

- How - describe a process to identify, involve and eventually integrate the community as an entity that will apply mission science and data products in addressing critical societal issues.

White Paper – Objectives

- Identify the Community of Practice(CoP) for each mission and ensure flight missions are investing to produce products of maximal value for the community;
- Involve the CoP into the mission development life cycle in the early stages of decision-making;
- Implement the NRC Decadal Survey and NASA Climate Architecture goals[related to Applications];
- Ensure a sustained interaction with the CoP to maximize impact of NASA Earth science investments.

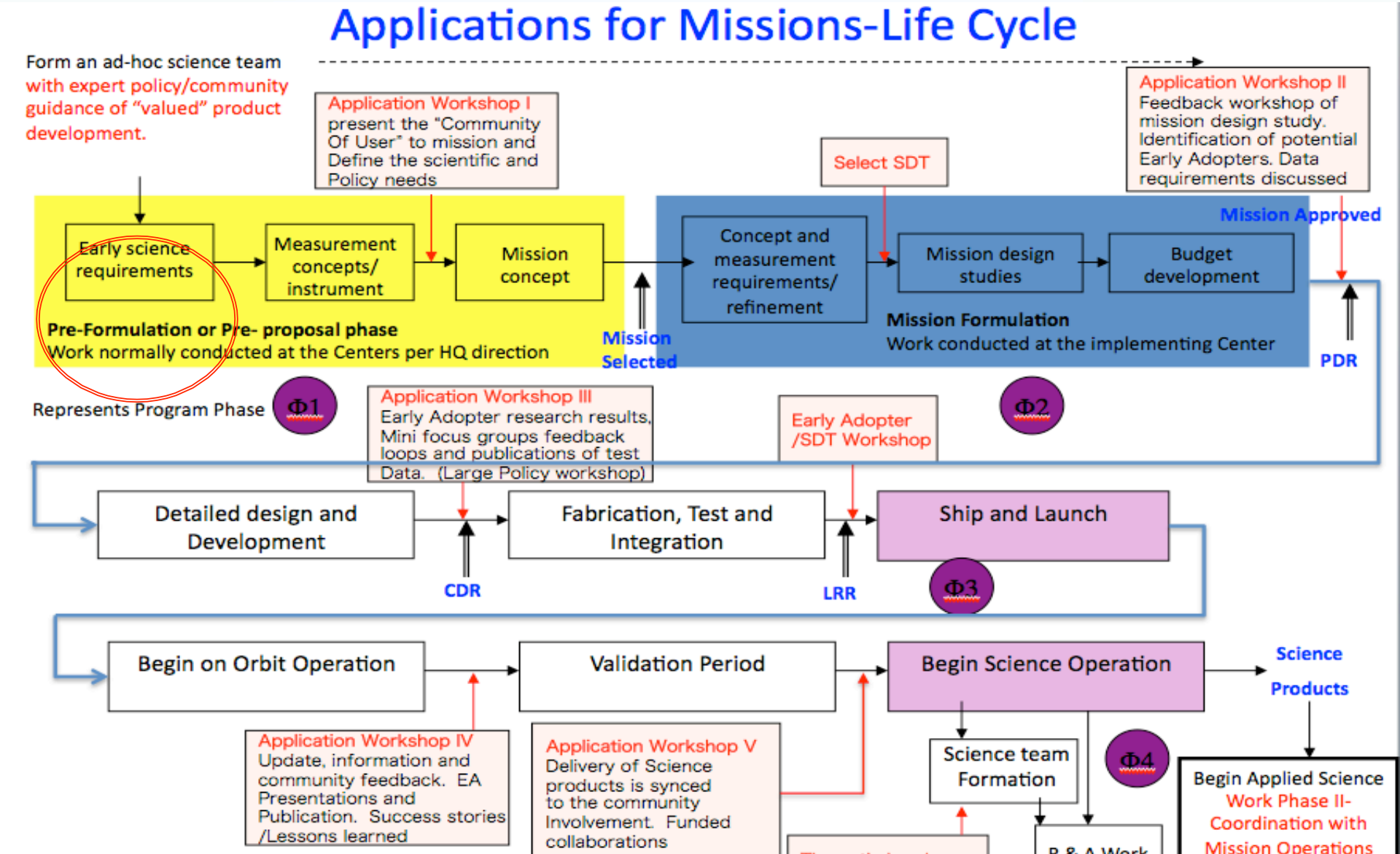
Early Adopters

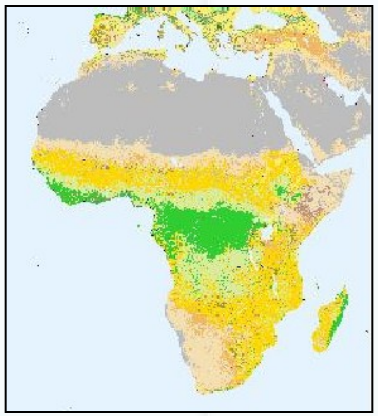
- A subset of the Community of Practice and should be given access to pre- and post-launch data streams and conduct applications demonstrations in collaboration with the science team.

- The selection process may be through a competitive, peer-reviewed NASA announcement of opportunity as was done for the science definition team, or a more informal process. At a minimum, the process should include a proposal, a selection committee and notification of selection.

SWOT Mission Applications

Mission Development





Global Land Cover by Type at 1km

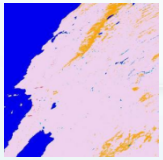
Terra-MODIS

☆☆☆☆☆ (13,769 user reviews)

Level 3. SIN Grid

Ships from Land Processes DAAC

Customers Who Accessed This Item Also Accessed



Burned Area

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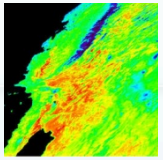

LST Emissivity

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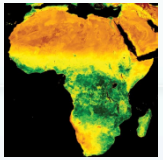
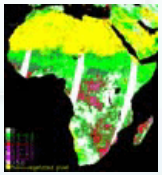


NDVI

☆☆☆☆☆



Leaf Area Index FPAR

☆☆☆☆☆

Editorial Reviews

MODIS Science Team

The MODIS Land Cover Type product contains multiple classification schemes, which describe land cover properties derived from observations spanning a year's input of Terra data. The primary land cover scheme identifies 17 land cover classes defined by the International Geosphere Biosphere

Programme (IGBP), which includes 11 natural vegetation classes, 3 developed and mosaicked land classes, and three non-vegetated land classes.

The MODIS Terra Land Cover Type Yearly L3 Global 1 km SIN Grid product incorporates five different land cover classification schemes, derived through a supervised decision-tree classification method.

See all Editorial Reviews

Product Details

Product code: MOD12Q1
Platform: Terra
Raster Type: Tile
Resolution: 1000m
Temporal Granularity: Annual
Earth Science Best Sellers Rank: #142

Customer Reviews

Average Customer Review: ☆☆☆☆☆ (278 customer reviews)

Most Helpful Customer Reviews

78 of 81 people found the following review helpful**:**
Latest product is based on MODIS v.5; found that the urban classification is underrepresented but otherwise a great product.

› See all 278 customer reviews...