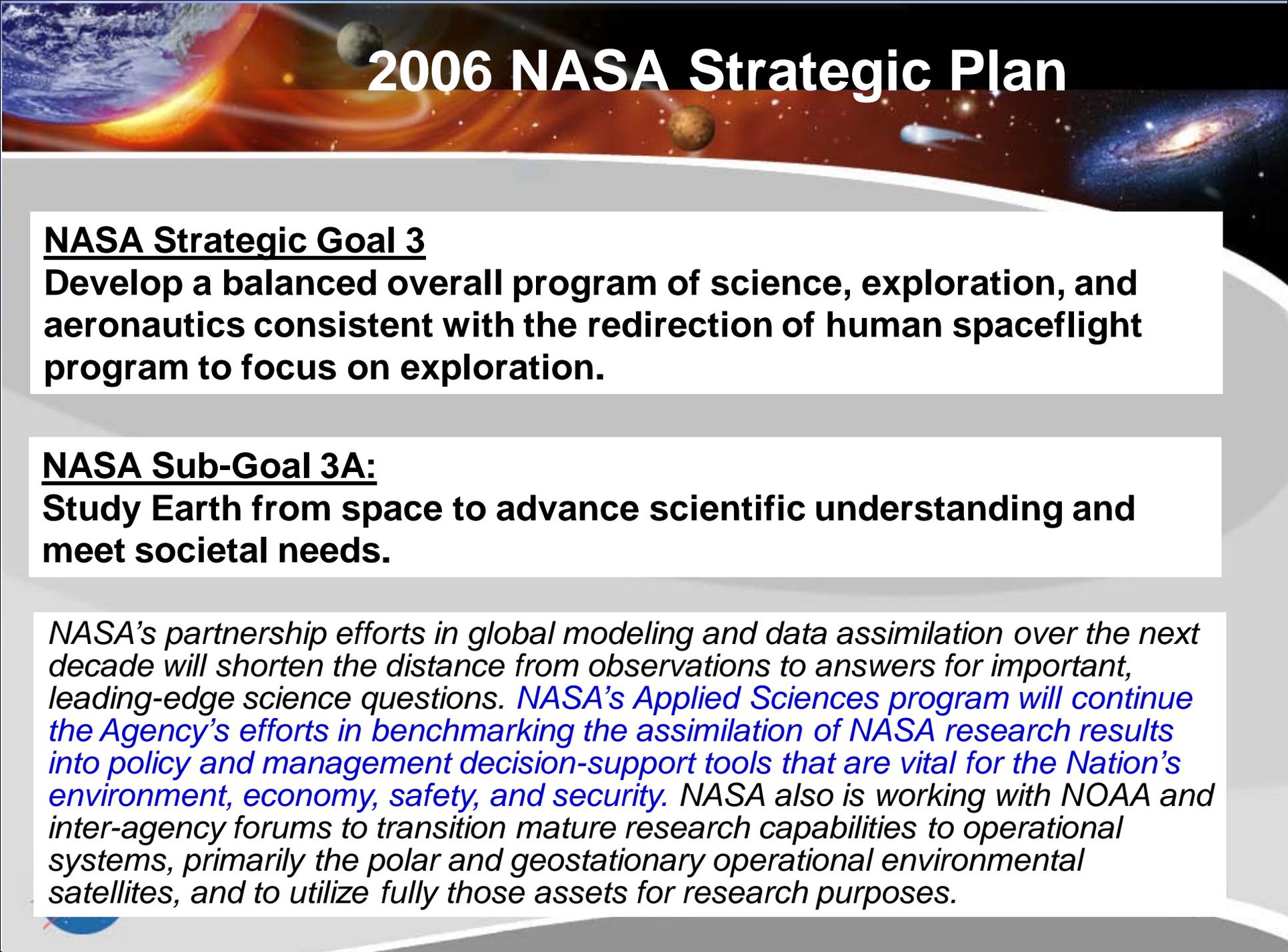




# **NASA Applied Sciences Program Update**

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***Applied Sciences Program  
Earth Science Division  
Science Mission Directorate  
NASA Headquarters  
Washington, DC USA***



# 2006 NASA Strategic Plan

## **NASA Strategic Goal 3**

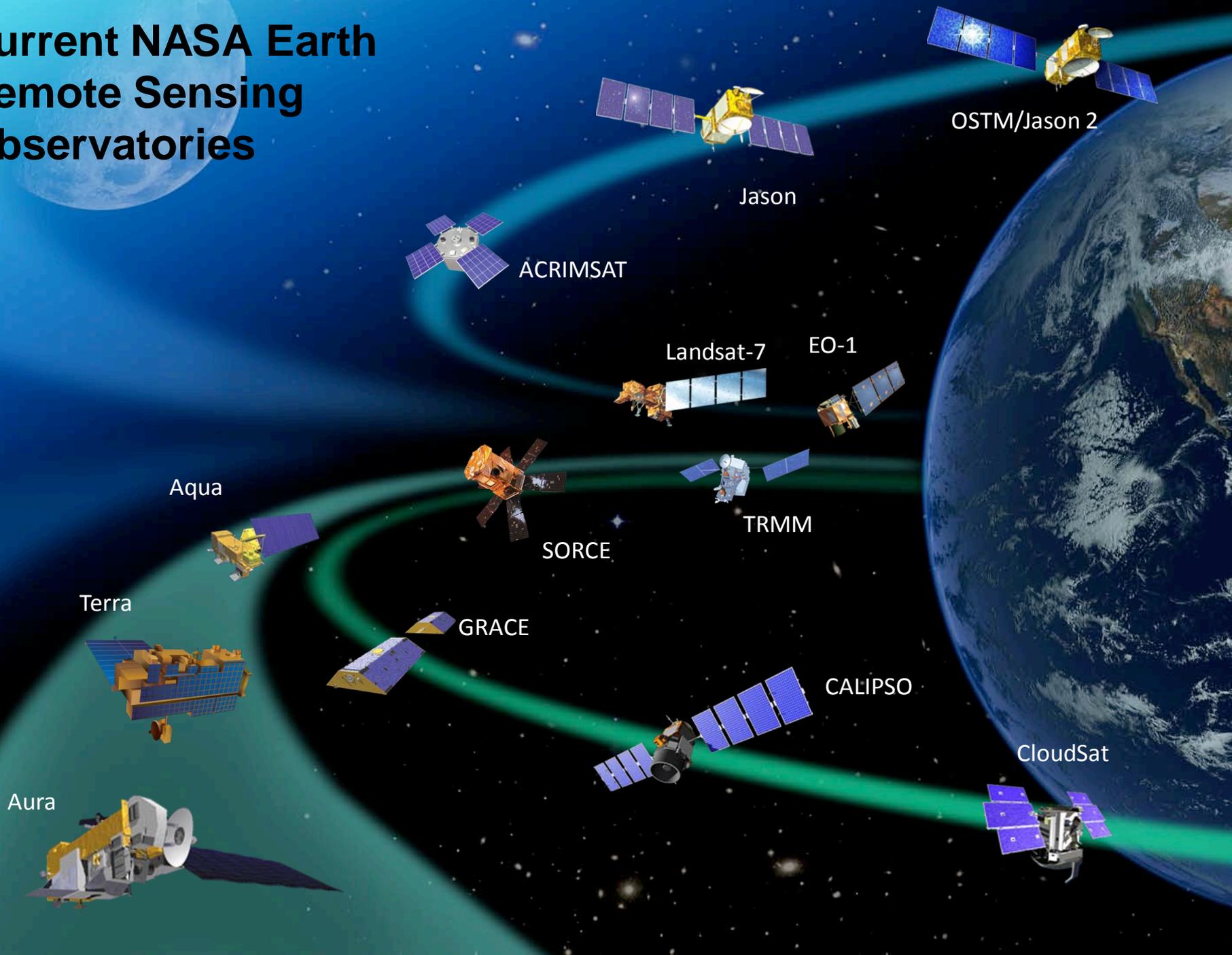
**Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of human spaceflight program to focus on exploration.**

## **NASA Sub-Goal 3A:**

**Study Earth from space to advance scientific understanding and meet societal needs.**

*NASA's partnership efforts in global modeling and data assimilation over the next decade will shorten the distance from observations to answers for important, leading-edge science questions. **NASA's Applied Sciences program will continue the Agency's efforts in benchmarking the assimilation of NASA research results into policy and management decision-support tools that are vital for the Nation's environment, economy, safety, and security.** NASA also is working with NOAA and inter-agency forums to transition mature research capabilities to operational systems, primarily the polar and geostationary operational environmental satellites, and to utilize fully those assets for research purposes.*

# Current NASA Earth Remote Sensing Observatories





# Earth Science Division Overview

- ***Overarching goal: to advance Earth System science, including climate studies, through spaceborne data acquisition, research and analysis, and predictive modeling***
- **Six major activities:**
  - Building and operating Earth observing satellite missions, many with international and interagency partners
  - Making high-quality data products available to the broad science community
  - Conducting and sponsoring cutting-edge research in 6 thematic focus areas
    - Field campaigns to complement satellite measurements
    - Modeling
    - Analyses of non-NASA mission data
  - **Applied Sciences**
  - Developing technologies to improve Earth observation capabilities
  - Education and Public Outreach

# Earth System Science



Sun- Earth  
Connection

Climate Variability  
and Change

Carbon Cycle  
and Ecosystems

Earth Surface  
and Interior

Atmospheric  
Composition

Weather

Water &  
Energy  
Cycle



# NASA Earth Science Division FY11 President's Budget

- FY10: \$1,420.7 (\$ millions)
- FY11: \$1,801.8
- FY12: \$1,944.5
- FY13: \$2,089.5
- FY14: \$2,216.6
- FY15: \$2,282.2

## ■ Major Items:

- \$150M to accelerate Earth Science “Decadal Survey” Missions
- \$170M to develop and launch OCO-2
- New Climate Initiative to be launched
- NPOESS restructured. NOAA and NASA will take primary responsibility for the afternoon orbit. The new “Joint Polar Satellite System” will consist of platforms based on the NPP satellite, with procurement structures modeled after the POES and GOES programs.





# NASA Applied Sciences Program Strategy (2010-2015)

## *Vision:*

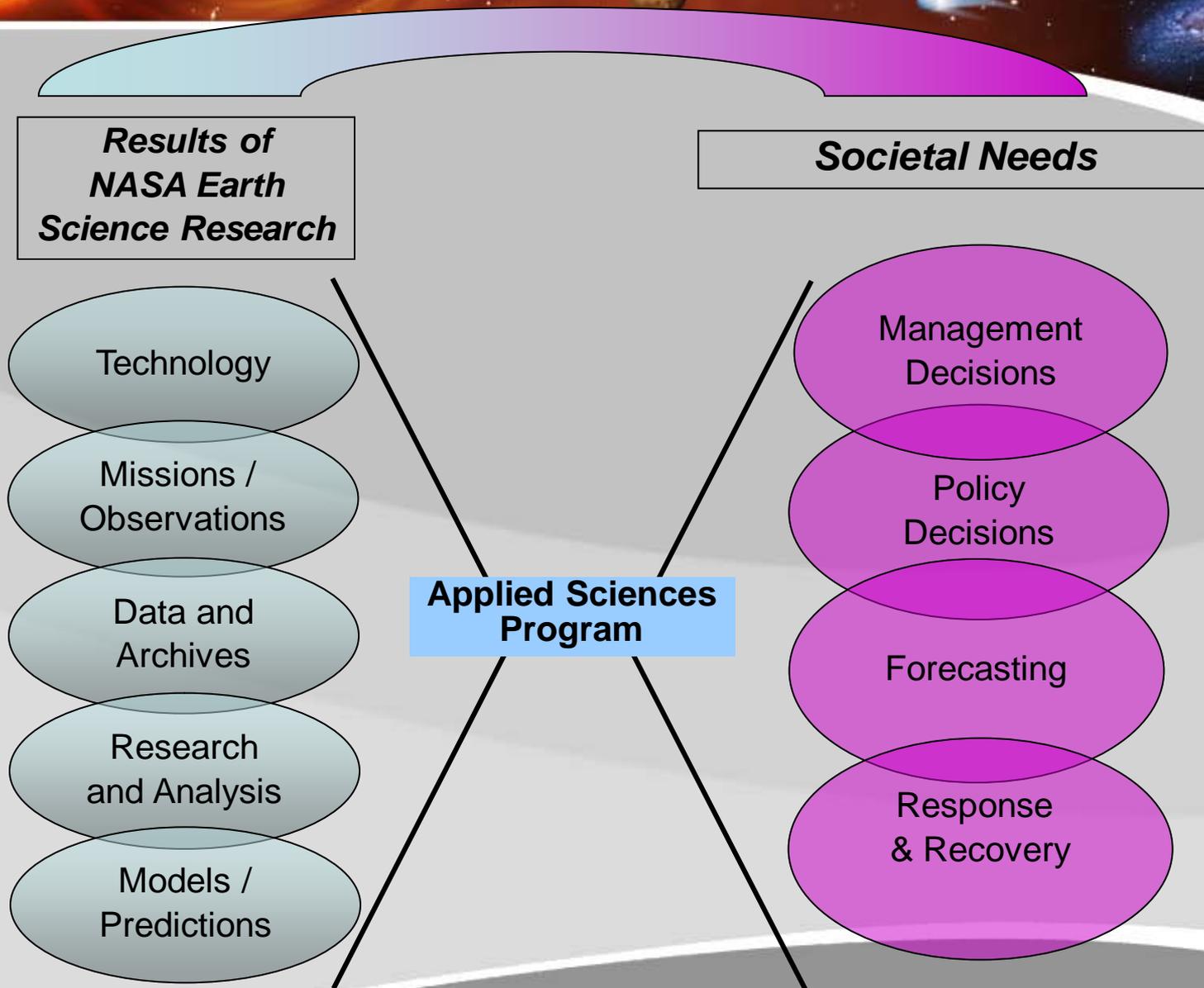
**Achieve the greatest possible utility of NASA's investment in Earth science and observations by enabling its application to practical societal needs.**

## *Mission:*

**Advance the realization of societal and economic benefits from NASA Earth science by identifying societal needs, conducting applied research and development, and collaborating with application developers and users.**



# NASA Applied Sciences Architecture





# Applied Sciences Program

## *Eight Program Elements*



**Agricultural  
Efficiency**



**Air Quality**



**Climate**



**Disaster  
Management**



**Ecological  
Forecasting**



**Public Health**



**Water  
Resources**



**Weather**

# Focus Areas of Weather

The Weather application focuses on Earth science applications to support ***weather-affected economic interests, currently including aviation and space weather.*** The application is particularly focused on applications to support the ***Next Generation Air Transportation System (NextGen).*** As appropriate, the application may expand to support other specific weather-affected economic interests to improve the global mobility of people and material.



# News Items in the ASP during 2009-10

- Dr. Teresa Fryberger stepped down as Associate Director in October 2009 to take a position in the Office of the Deputy Administrator.
  - Lawrence Friedl is currently Acting Associate Director of the ASP
- Section 306 of the 2008 NASA Authorization Act, specifically mandated that, “The [NASA] Administrator and the Administrator of NOAA shall develop a collaborative research plan on convective weather events. The goal of the research is to significantly improve the reliability of 2-hour to 6-hour aviation weather forecasts.”
  - Document is currently in concurrence phase at NASA
- NASA Earth Observing Missions Applications Workshop conducted in February 2010 in collaboration with the NASA Earth Science Flight Program.
- Five new competitively selected grants were awarded in the Weather Applications program through NASA ROSES 2008.





# NASA ROSES GULF 2009 (A.40): “Earth Science for Decision Making: Gulf of Mexico Region”

## Particulars

- Total Amount of Funding : ~\$5M total
- Anticipated Number of Awards: 10 – 20 projects
- Expected Range of Award per project: Up to 400K total
- Period of Performance: Up to 24 months

## Schedule

- Proposals Due: November 19, 2009
- Peer Review Panels: February-March 2010
- Earth Science Selection Committee Review: April 2010
- Selections Announced: April 2010
  
- 54 proposals submitted (6 in the Weather Applications area)

# Future Observations – Near Term

- **Aquarius – 2010**
  - Sea surface salinity (SSS) observations needed for studies of ocean circulation, climate and the global water cycle. SSS observations will allow the monitoring of variations in the water cycle including: land runoff, sea ice freezing and melting, evaporation, and precipitation over the oceans.
- **Glory – 2010**
  - Collect data on the properties of aerosols, including black carbon, in the Earth's atmosphere and climate system; collect data on solar irradiance for the long-term effects on the Earth climate record.
- **NPOESS Preparatory Mission (NPP) -- 2011**
  - NPP will serve as a bridge mission between the NASA Earth-observing research satellites Terra, Aura, and Aqua and the operational Joint Polar Satellite System (JPSS).
- **Landsat Data Continuity Mission (LDCM) -- 2013**
- **Global Precipitation Mission (GPM) – 2013**
  - Will provide accurate observations of the intensity and distribution of global precipitation. GPM builds on the heritage of the TRMM mission and is in partnership with JAXA.



# Selected Future Observations – Decadal Survey

- **Hyperspectral Infrared Imager (HyspIRI) – NET 2015**
  - HyspIRI will employ a hyperspectral imager and a thermal infrared scanner to monitor a variety of ecological and geological features at a wide range of wavelengths, including data on changes in vegetation type and deforestation for ecosystem management .
- **Soil Moisture Active Passive (SMAP) – 2013**
  - SMAP will use a combined radiometer and high-resolution radar to measure surface soil moisture and freeze-thaw state.
- **Deformation, Ecosystem Structure, and Dynamics of Ice (DESDynI) – NET 2015**
  - DESDynI is a dedicated InSAR and LIDAR mission optimized for studying hazards and global environmental change, including the effects of changing climate on land use and species habitats.



# 2010



Aqua

Terra

Aura

Glory

GRACE

ACRIMSAT

SORCE

Landsat-7

EO-1

Aquarius

Jason

OSTM/Jason 2

TRMM

CALIPSO

CloudSat

# 2011



Aqua

Terra

Aura

Glory

GRACE

NPP

CALIPSO

CloudSat

TRMM

EO-1

Landsat-7

SORCE

ACRIMSAT

Jason

Aquarius

OSTM/Jason 2

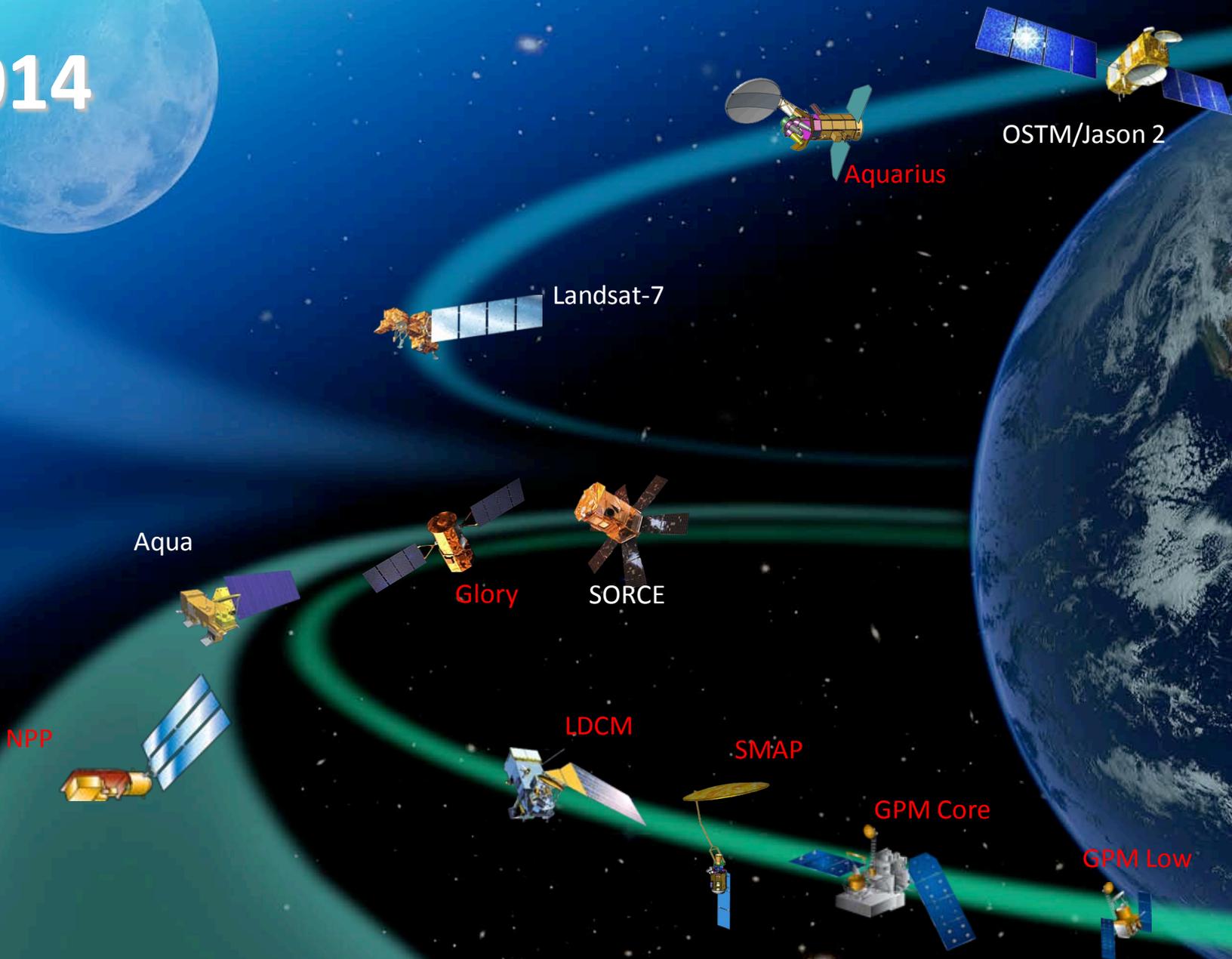
# 2012



# 2013

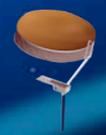


# 2014



# 2015

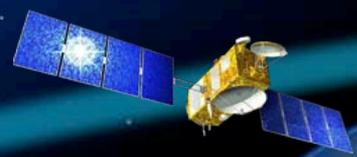
DesDynI



Aquarius



OSTM/Jason 2



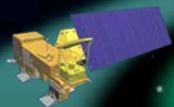
Landsat-7



ICESat II



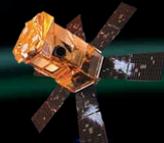
Aqua



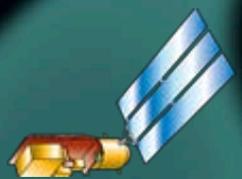
Glory



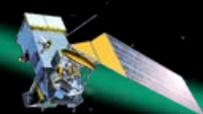
SORCE



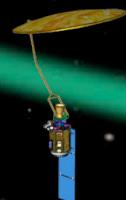
NPP



LDCM



SMAP



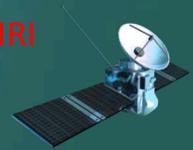
GPM Core



GPM Low



HyspIRI



# 3 NASA Goals of this Meeting

- Update of progress on current projects
- Explore opportunities for collaboration or leveraging results between projects and agencies, including possible joint solicitations
- Obtain community input on potential topics for the NASA ROSES 2010 solicitation.



# Applied Sciences Program



National Aeronautics and  
Space Administration

Earth Science Enterprise  
Applications Plan



The View From Space:  
**NASA Earth Observations Serving Society**



<http://appliedsciences.nasa.gov>

