Water Resources Program Update

NASA Water Resources Program Team Meeting 2016
National Water Center, UA, Tuscaloosa, AL

NASA Applied Sciences Program

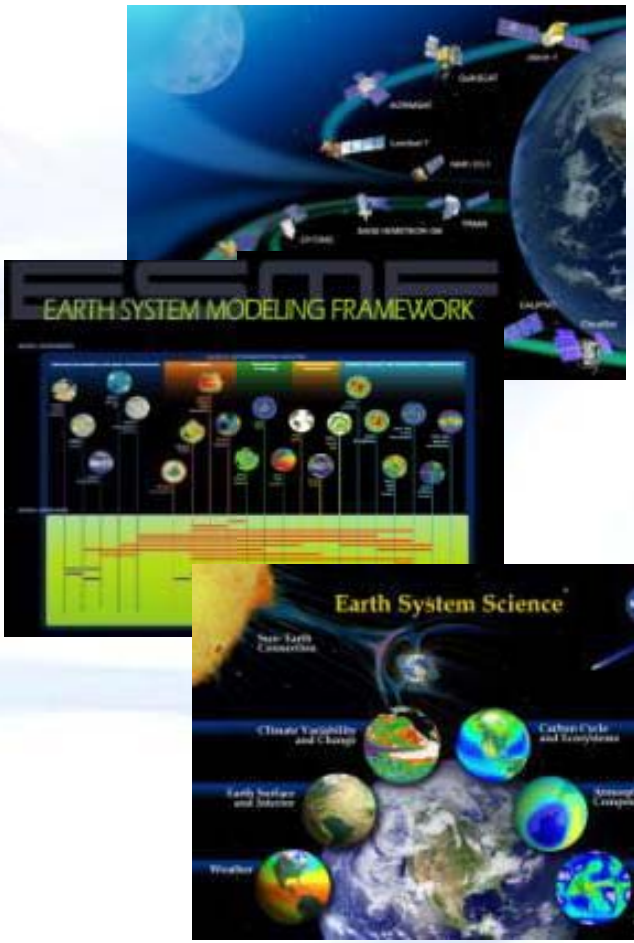
Bradley Doorn, Program Manager, NASA HQ
Forrest Melton, Associate PM, NASA ARC-CREST
John Bolten, Associate PM, NASA GSFC
Christine Lee, Associate PM, NASA JPL

NASA Applied Sciences Program

A Pathway Between Earth Science & Society

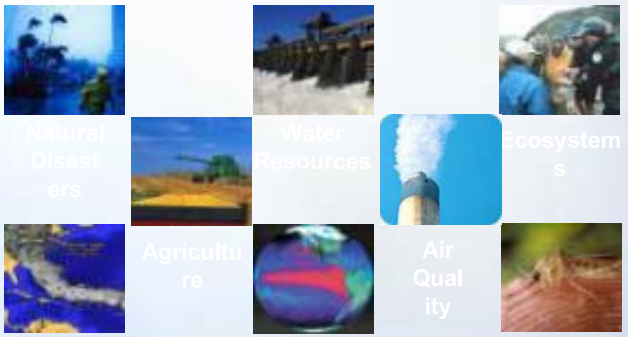
Results of NASA Earth Science Research

Uses by Partners and Stakeholder Communities



NASA Applied Sciences Program

GEOSS Societal Benefit Areas



Application Program Elements

Emphasis in 4 Applications Areas

Health & Air Quality

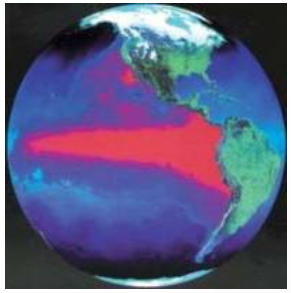
Water Resources

Disasters

Ecological Forecasting

Support opportunities in 5 additional areas

Agriculture



Climate

Weather

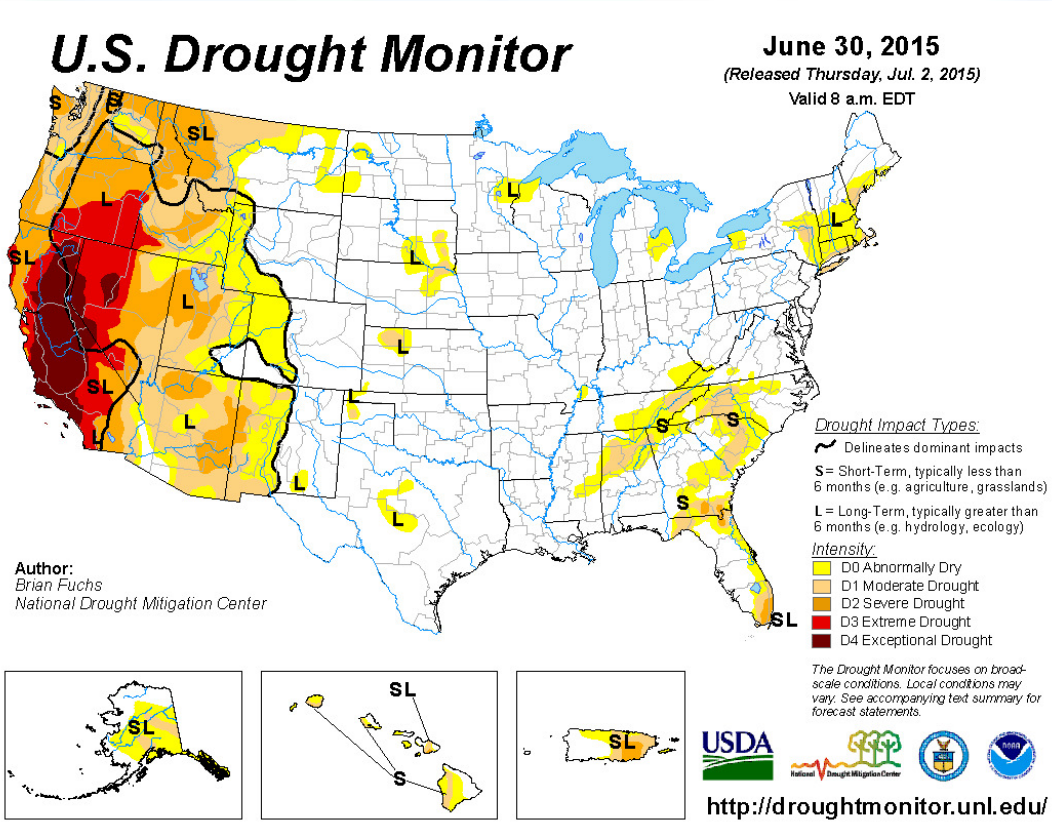
Energy

Oceans

NASA Water Resource Applied Sciences

The NASA Water Resources Program Element:

The Water Resources Program Element addresses concerns and decision processes that are related to water availability, water forecast, and water quality. The goal of the Water Resources Program Element is to apply NASA satellite data to improve the Decision Support Tools (DSTs) of user groups that manage water resources. Implementation requires close and enduring partnerships with Federal agencies, academia, private firms, and international organizations.



Water Resources Projects:

Projects are tactical implementations led by Principal Investigators, driven by water management challenges, and ultimately sustained by water resource information stakeholders.

Programmatic Activities:

National and international activities to improve skills, share data and applications, and broaden the range of users who apply satellite data and Earth science in water resource decisions.

ROSES 2011& 2013 NASA Water Resources Projects

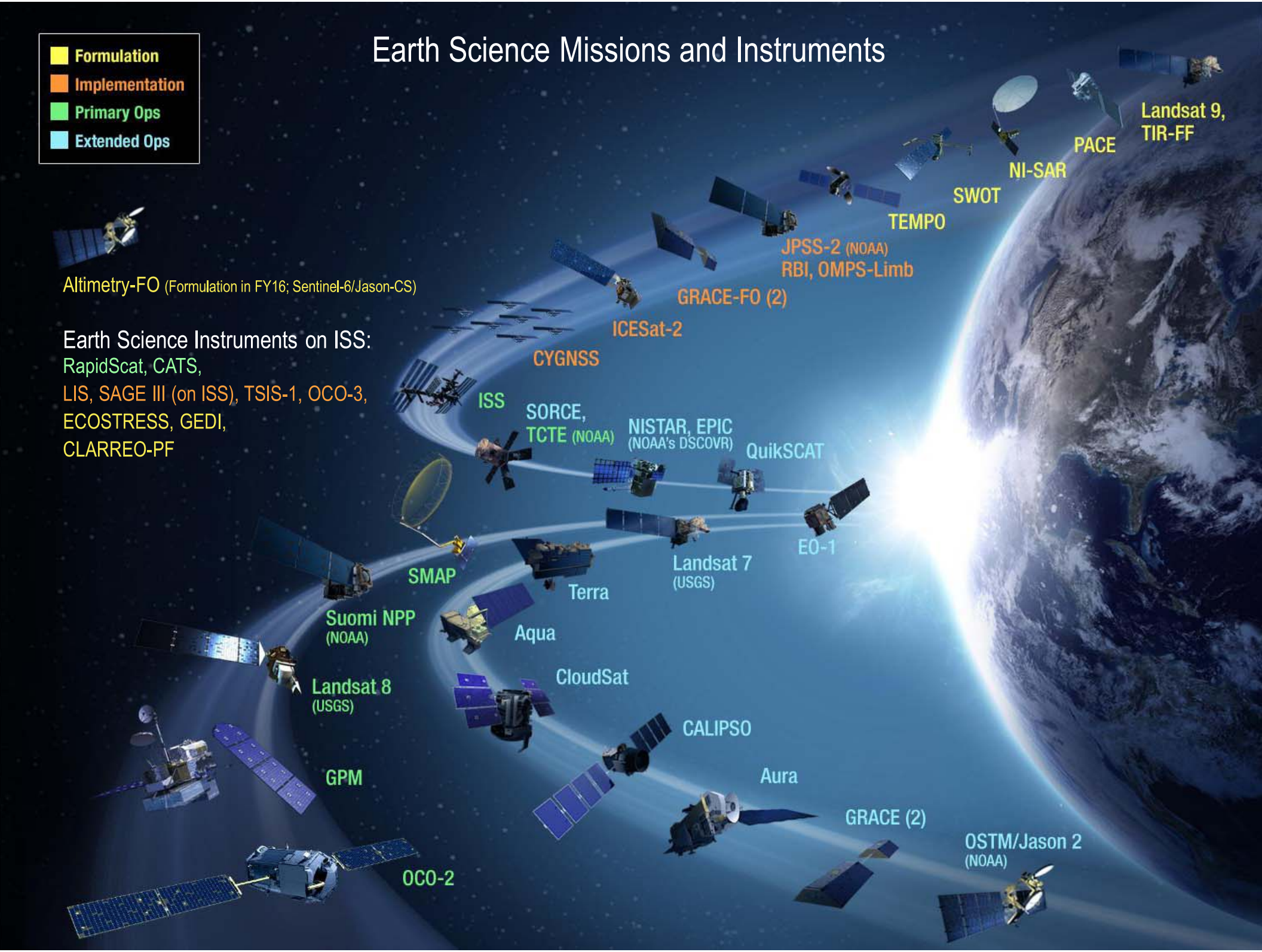
PI	Title	PI Org.	Associate PM	Solicitation
AGHAKOUCHAK	Advancing Drought Onset Detection and Seasonal Prediction Using a Composite of NASA Model and Satellite Data	UCI	Melton	ROSES 2013 – WR Anomaly Outlook
BOLTEN	Enhancing the USDA Global Crop Production Decision Support System with NASA Soil Moisture Active Passive (SMAP) Satellite Observations	NASA/GSFC	Lee	ROSES 2013 – WR Anomaly Outlook
DAY	Advancing Water Supply Forecasts in the Colorado River Basin for Improved Decision Making	Riverside Tech. Inc.	Melton	ROSES 2013 – WR Anomaly Outlook
GEBREMICHAEL	Optimizing Reservoir Operations for Hydropower Production in Africa through the use of Remote Sensing Data and Seasonal Climate Forecasts	UCLA	Lee	ROSES 2013 – WR Anomaly Outlook
HOSSAIN	Towards Operational Water Resources Management in South Asia Exploiting Satellite Geodetic and Remote Sensing Technologies	UW	Lee	ROSES 2013 – WR Anomaly Outlook
JACOBS	Satellite Enhanced Snowmelt Flood Predictions in the Red River of the North Basin	UNH	Bolten	ROSES 2013 – WR Anomaly Outlook
PETERS-LIDARD	Predicting Middle Eastern and African Seasonal Water Deficits using NASA Data and Models	NASA/GSFC	Bolten/Lee	ROSES 2013 – WR Anomaly Outlook
RODELL	Integrating GRACE and GRACE Follow On Data into Flood and Drought Forecasts for the Continental U.S.	NASA/GSFC	Bolten	ROSES 2013 – WR Anomaly Outlook
STANFORD	Decision Support System (DSS) to Enhance Source Water Quality Modeling and Monitoring using Remote Sensing Data	Hazen – Sawyer, P.C.	Lee	ROSES 2013 – WR Anomaly Outlook
BIRKETT	The Global Reservoir and Lake Monitor (GRLM): Expansion and Enhancement of Water Height Products.	UMD	Bolten	ROSES 2013 – Drought
DOZIER	Assessing Water Resources in Remote, Sparsely Gauged, Snow-Dominated Mountain Basins	UCSB	Melton	ROSES 2013 – Drought
HAIN	Development of a Mult-Scale Remote Sensing Based Framework for Mapping Drought over North America	NOAA	Melton	ROSES 2013 – Drought
BECKER-RESHEF	Global monitoring of agricultural drought: A contribution to GEO GLAM	UMD	Bolten	ROSES 2013 – Drought
MELTON	Mitigation of Drought Impacts on Agriculture through Satellite Irrigation Monitoring and Management Support	NASA/ARC	Bolten	ROSES 2013 – Drought
PAINTER	Integration of precision NASA snow products with the operations of the Colorado Basin River Forecast Center to improve decision making under drought conditions	NASA/JPL	Melton	ROSES 2013 – Drought
ROSENZWEIG	Adaptation Planning for Climate Change Impacts using Advanced Decision Support and Remote Sensing: Irrigated Agriculture in California's Central Valley	NASA/GSFC	Melton	ROSES 2013 – Drought
VERDIN	Fallowed Area Mapping for Drought Impact Reporting and Decision Making	USGS	Melton	ROSES 2013 – Drought
WARDLOW	The Quick Drought Response Index (QuickDRI): An Integrated Approach for Rapid Response Agricultural Drought Monitoring	UNL	Melton	ROSES 2013 – Drought

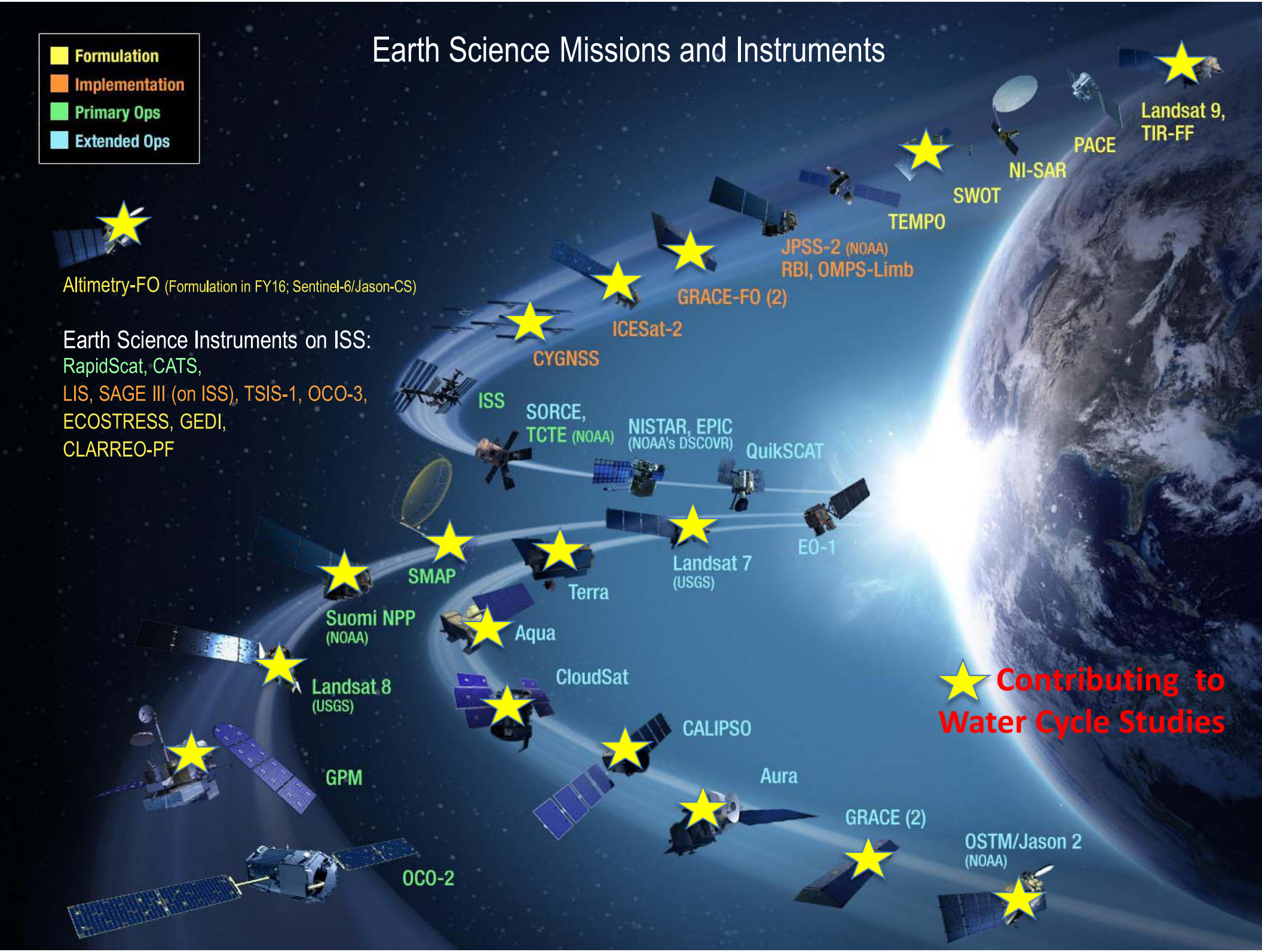
NASA Water Resources Projects – Co-funding

PI	Title	PI Org.	Associate PM
SCHAEFFER	Cyanobacteria Assessment Network	EPA	Lee
PAINTER	Airborne Snow Observatory	JPL	Melton

ROSES2013 – Impact Assessments

- Budget confirmed last week.
- 9 Augmentation Proposals
- Final notification next week


Formulation
Implementation
Primary Ops
Extended Ops
Earth Science Missions and Instruments
Altimetry-FO (Formulation in FY16; Sentinel-6/Jason-CS)
Earth Science Instruments on ISS:
RapidScat, CATS,
LIS, SAGE III (on ISS), TSIS-1, OCO-3,
ECOSTRESS, GEDI,
CLARREO-PF
Landsat 9,
TIR-FF
PACE
NI-SAR
SWOT
TEMPO
JPSS-2 (NOAA)
RBI, OMPS-Limb
GRACE-FO (2)
ICESat-2
CYGNSS
ISS
SORCE,
TCTE (NOAA)
NISTAR, EPIC
(NOAA's DSCOVR)
QuikSCAT
EO-1
Landsat 7
(USGS)
SMAP
Terra
Suomi NPP
(NOAA)
Aqua
CloudSat
Landsat 8
(USGS)
CALIPSO
GPM
Aura
GRACE (2)
OSTM/Jason 2
(NOAA)
OCO-2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(NOAA)
OCO-2
Contributing to
Water Cycle Studies

Mission Application Teams

KEY WATER RESOURCES MISSION APPLICATION INVESTMENTS

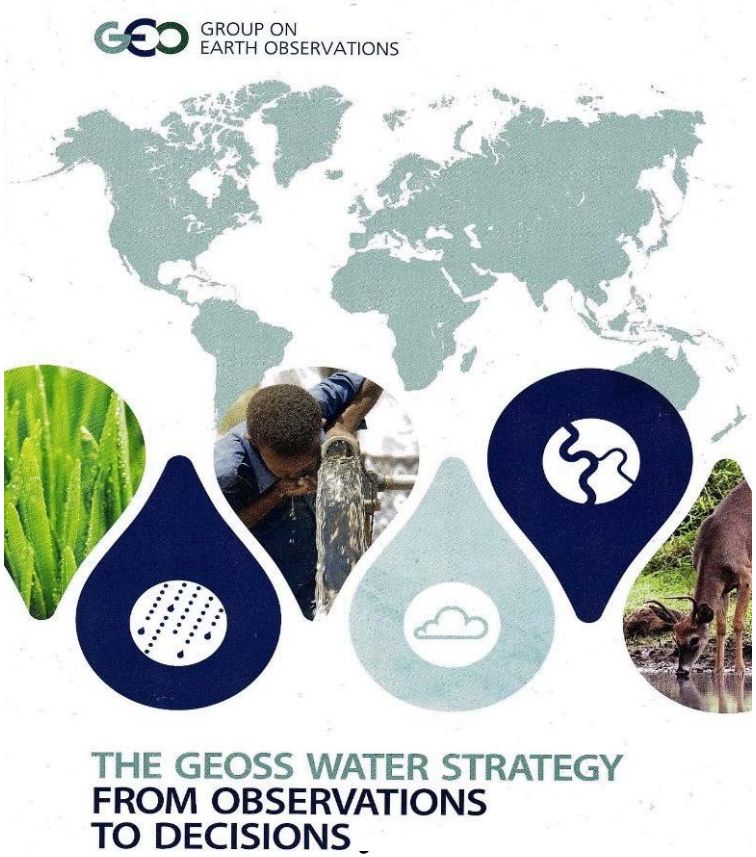
- SMAP (Phase E)
- GRACE-FO/GRACE-II
- IceSat-2
- NISAR
- ECOSTRESS
- SWOT
- Landsat 9 (USGS)

New NASA Application "Centers"

- **Western U.S. Water**
  - Based at JPL
  - Kick-off CY2016
- **Global Food Security**
  - Based at GSFC
  - Kick-off CY2017
- **Disasters**
  - TBD
  - TBD

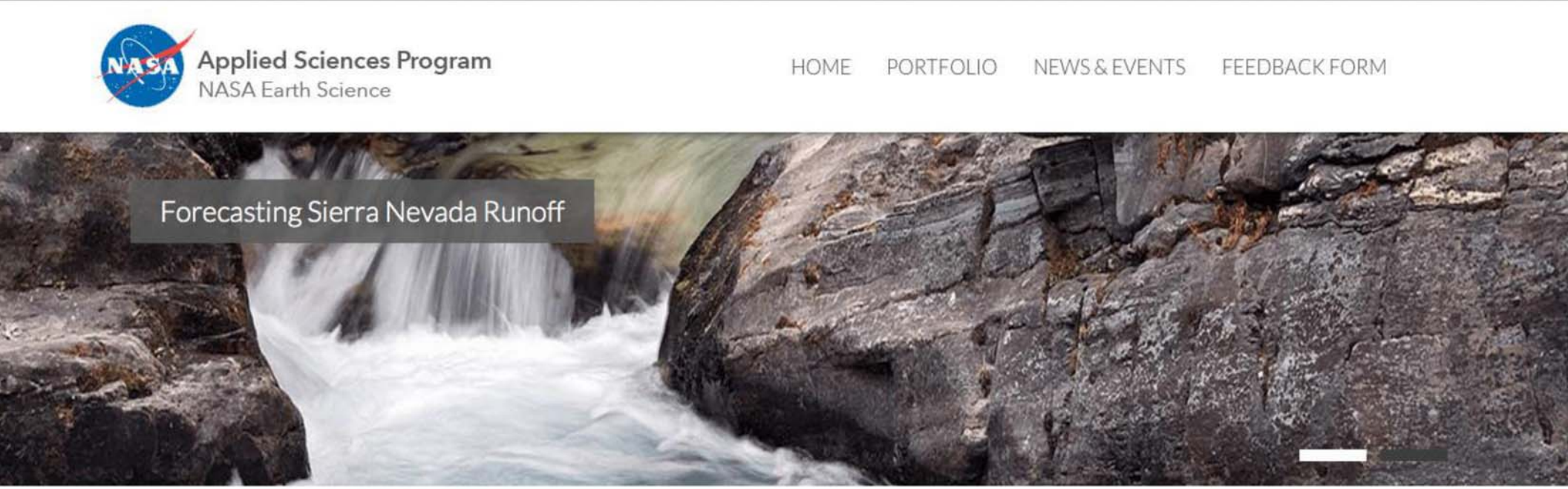
GEOGLOWS and the GEOSS Water Strategy

The GEOSS Water Strategy was prepared in 2014 to communicate the capabilities and needs of the GEO Water community to GEO members and the broader community as plans are made for the next phase of GEO.



GEOGLOWS addresses five of the six priority areas with its strategies and on-going activities, and provides a framework for enabling GEO Members to address many of the Water Strategy's 58 recommendations.

Water Resources Program Websites



http://appliedsciences.nasa.gov/programs/water-resources-program

Water Resources Program Websites

Applied Sciences Program

Home (Start here) | About (Our Mission) | News (What's happening) | Projects (Learn more) | Community (Collaborate) | Resources (More Info) | Events | Login / Register

NASA Applied Sciences Program
Water Resources

Earth Science Serving Society

The goal of the ASP Water Resources application area is to apply NASA satellite data to improve the decision support systems of organizations and user groups that manage water resources. The ASP Water Resources application area partners with Federal agencies, academia, private firms, and international organizations.

LEARN MORE

https://c3.nasa.gov/water/

Welcome to the NASA Applied Sciences Program
Water Resources Application Area

NASA ROSES 2016: A.37 Water Resources

"This solicitation seeks proposals that apply remote sensing observations to improve sustainability of water resources and enhance resiliency to threats to water security and variability in water use over time. Specifically, this solicitation focuses on two key components of enhancing water security: 1) detecting and understanding changes in **water quality** to identify and mitigate threats to water quality, OR, 2) understanding variability of **agricultural water use** and detecting short and long-term imbalances between agricultural water supplies and agricultural water requirements. Proposals are encouraged to seek innovative, open and sustainable data processing and delivery solutions for stakeholders."

- $9M in funding
- ~5-10 awards
- Project duration of 3 years ($275k - $550k per year)
- **Two step solicitation process**: Step 1 proposals due May 1, 2016
  - Anticipated start dates of Dec. 1, 2016

https://nspires.nasaprs.com/external/viewrepositorydocument/cmdocumentid=498130/solicitationId=%7B79420B5C-AA9A-C2A6-AD26-532A4631DBA2%7D/viewSolicitationDocument=1/A.37%20Water%20Resources.pdf

NASA ROSES 2016: A.37 Water Resources

"The proposed solutions must include a plan for integration into an **existing water resource decision-making process**. Application innovation, sensor integration or redundancy, and the long-term sustainability of the overall solution should be stressed. The proposed solutions, including the scientific basis for the proposed solution, should be fully described and referenced. This solicitation expects project teams to include, if not be led by, water management/policy personnel who will facilitate the transition to sustained operational use by the **water management partner or stakeholder**."

"The proposed solutions must include pathways to **sustainable solutions**. These pathways must address challenges of new and changing data sets, data latency, new data volumes, and/or new data algorithms/models through innovative technology solutions, as well as sound cost–benefit justifications."

NASA ROSES 2016: A.37 Water Resources

Evaluation criteria:

"Overall intent to apply Earth observations to make potentially valuable, substantive improvements to Water Quality or Agriculture Water Use challenges and breadth and potential impact of the project."

"In addition to the factors given in the *NASA Guidebook for Proposers*, the evaluation criterion "Intrinsic Merit" specifically includes the following factors:

- Overall ability to develop and test the value of the proposed concept and application;
- Overall plan and ability to use Earth science products and results (NASA Earth Science and other), model outputs, simulated products from planned missions, etc.;
- Overall ability to characterize the decision-making activities;
- Quality and extent of teaming across appropriate sectors and areas of expertise and the involvement of end-user organization(s) in the project; and
- Overall ability to enable a transition of project results to a sustained (e.g. cost realistic solution, well-integrated solution, etc), including evidence of innovative and sustainable data processing and delivery solutions for stakeholders."

Water Resources Program Team Meeting

MEETING OBJECTIVES:

- Program Feedback (How do we improve?)
- Share Experiences (What works and What doesn't?)
- Network (Relationships are critical!)
- NWC Perspective