



Influencing Water Resource Decisions Using NASA Observations, Science, and Technology

Border-Area Water Management Remote Sensing Workshop

8-9 June 2011

Bradley Doorn (NASA/HQ)
Water Resources Program

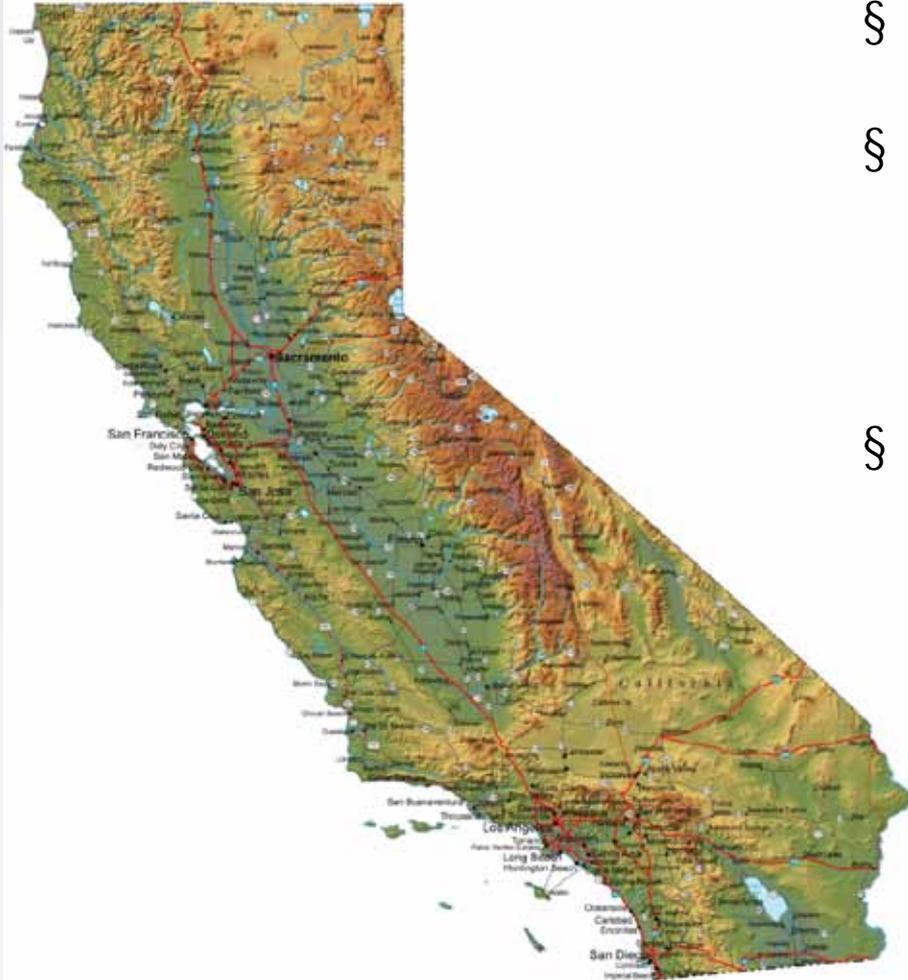
Workshop Goals

- § Provide water managers on both sides of the border with an overview of remote sensing data and tools that could be applied to bi-national water management issues,
- § Build on experience gained from NASA's recent research project (funded by the American Recovery and Reinvestment Act of 2009) – *and other NASA projects* - to demonstrate potential use of existing remote sensing data sets for water resources applications in the California-Mexico border region.

Common threads in border water management are the need to better prepare for droughts and the need for improved data collection and monitoring to support decision-making. Remote sensing's ability to integrate information over large geographic areas and to interpolate between scarce ground-based observations make it uniquely suited for border-area applications.



Water Supply and Management in California, Scalable to Regional and National Applications



- § Joint project between three NASA Centers (ARC, JPL, MSFC)
- § Collaboration with CA Dept. Water Resources (DWR), CA Cooperative Snow Survey, CO River Board, local water districts, USDA, agricultural producers
- § Project components:
 - § Optimization of agricultural water use through irrigation forecasting (ARC, MSFC)
 - § Snow Water Equivalent mapping (JPL, MSFC)
 - § Regional Climate Model Diagnostic Toolkit (JPL)
 - § Flood/surface water monitoring (JPL, DFO)
 - § Groundwater monitoring (JPL)



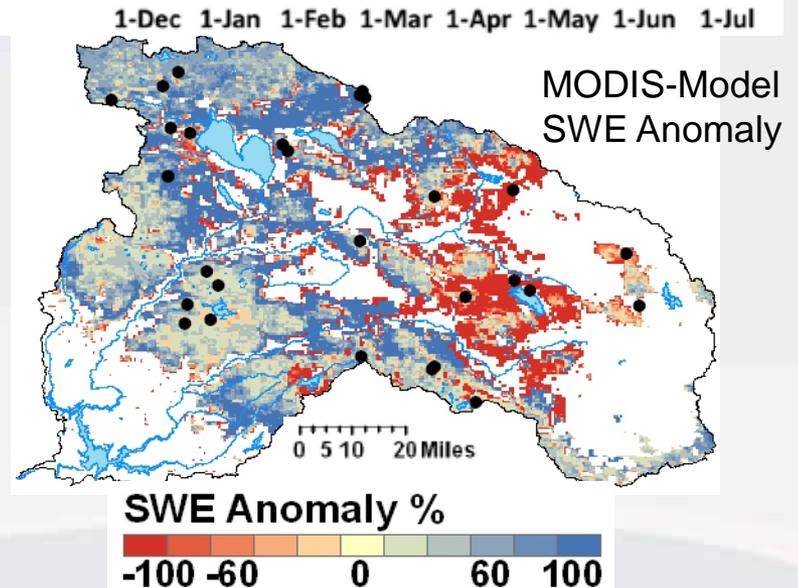
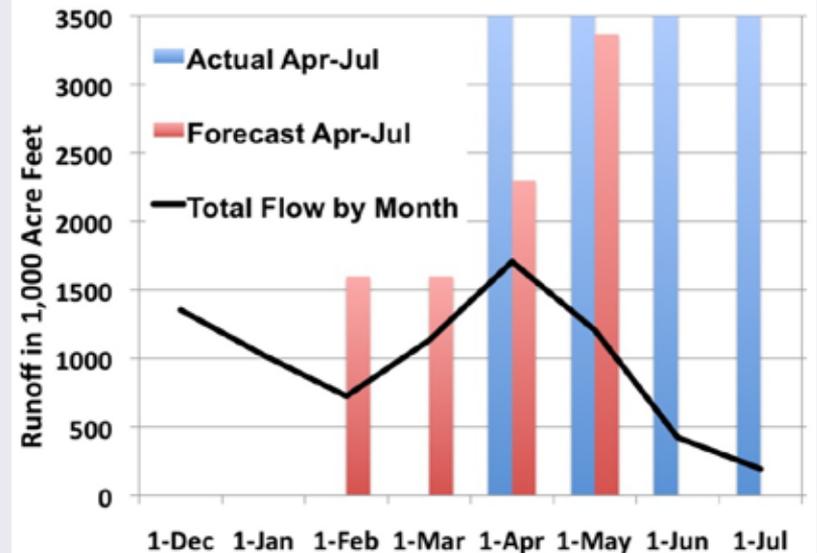
MODIS Snow Products Improve Water Resource Management

Noah Molotch, JPL CAL TECH / University of Colorado

Using MODIS observations of snow cover depletion and a snowmelt model, a 10-year reanalysis of daily Sierra Nevada snow water equivalent (SWE) at 500-m resolution has been generated. Using these data we show that SWE evaluated at points (black dots on map) misrepresented watershed SWE anomalies resulting in water supply forecast errors exceeding 1 Million Acre Feet (difference between blue and red bars).

These data are being used in partnership with the California Department of Water Resources to identify, and reduce water supply forecast errors, resulting in more efficient water resource management, and decreased vulnerability to climate variability and change.

Feather River, CA: Observed VS Forecasted Water Supply 2006

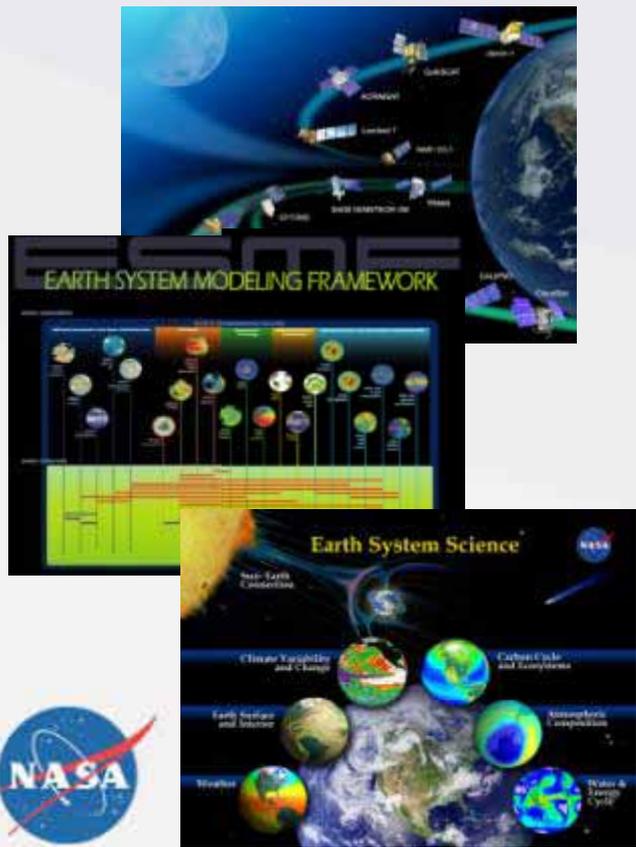


NASA Applied Sciences Program

A Pathway Between Earth Science & Society

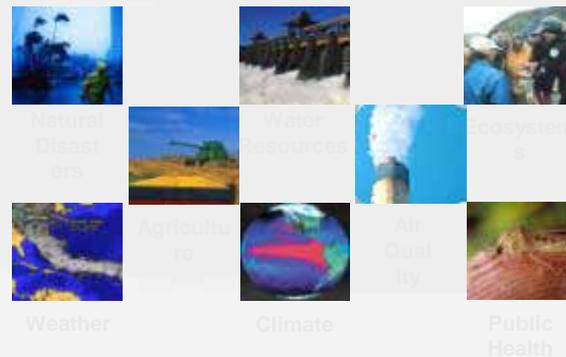
**Results of
NASA Earth
Science Research**

**Uses by Partners
and Stakeholder
Communities**



**NASA
Applied Sciences
Program**

GEOSS Societal Benefit Areas

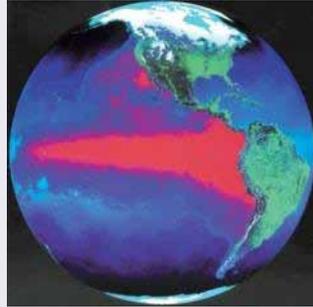


Applied Sciences Program

USGEO Societal Benefit Areas



Agriculture



Climate



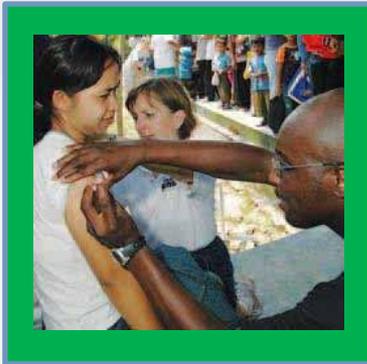
Disasters



Ecosystems



Energy



Health
(incl. Air Quality)



Oceans



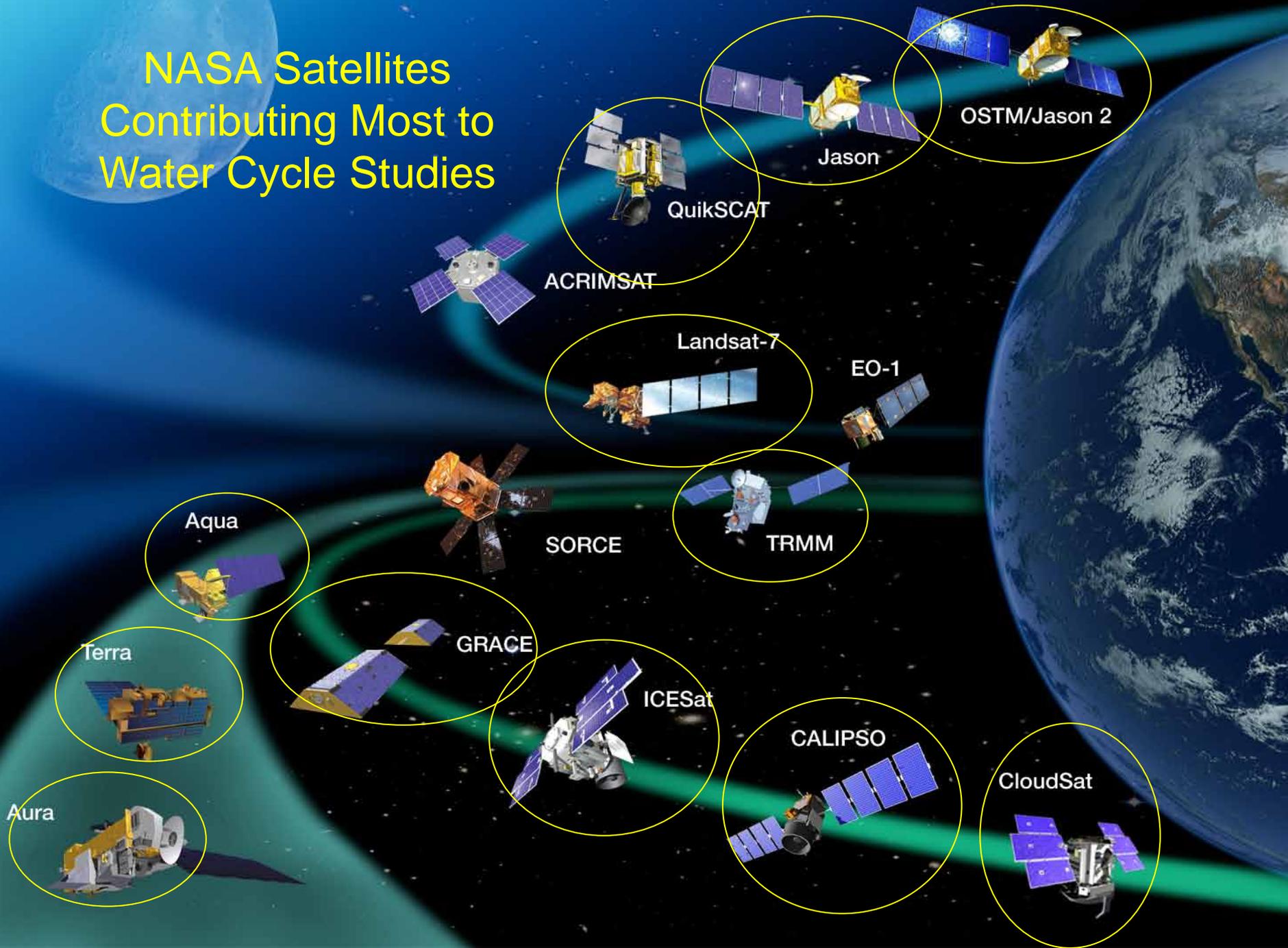
Water
Resources



Weather



NASA Satellites Contributing Most to Water Cycle Studies



Decadal Survey Missions Next Generation



Near-Term Missions:

Mid-Term Missions:

Late-Term Missions:

The legend shows three satellite icons: a blue satellite for Near-Term, a red satellite for Mid-Term, and a yellow satellite for Late-Term. Each icon is followed by a corresponding colored box for labeling.



GACM

GRACE-II

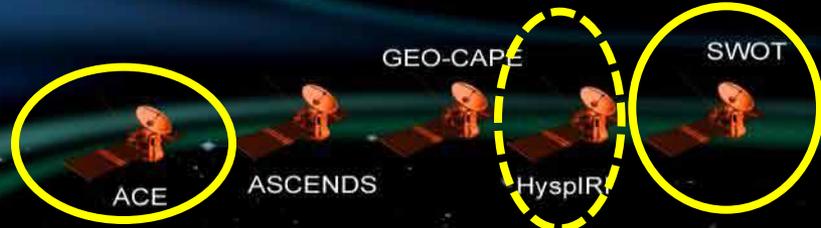
LIST

PATH

SCLP

3D Winds

This diagram shows five satellite orbits in the upper right quadrant, all circled in yellow. From left to right, they are labeled GACM, GRACE-II, LIST, PATH, and SCLP. A sixth satellite, 3D Winds, is shown further to the right but is not circled.



ACE

ASCENDS

GEO-CAPE

HyspIRI

SWOT

This diagram shows five satellite orbits in the middle section, all circled in yellow. From left to right, they are labeled ACE, ASCENDS, GEO-CAPE, HyspIRI, and SWOT.



CLARREO

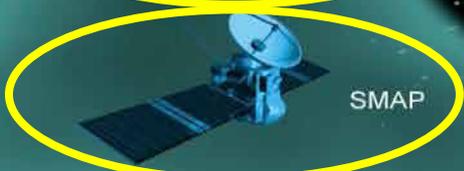
DESDynI

This diagram shows two satellite orbits in the lower left quadrant. CLARREO is a blue satellite and DESDynI is a red satellite. Both are circled with a dashed yellow line.



ICESat-II

This diagram shows one satellite orbit in the lower middle section, circled in yellow. It is labeled ICESat-II and is a blue satellite.



SMAP

This diagram shows one satellite orbit in the lower left quadrant, circled in yellow. It is labeled SMAP and is a blue satellite.



The 2nd SMAP Applications Workshop

Mapping soil moisture and freeze/thaw state from space

Washington, DC

October 12-14, 2011.

SMAP

Soil Moisture Active & Passive

- <http://smap.jpl.nasa.gov/applications/>

Search

Go

SCIENCE

EMAIL

SHARE

Home

Mission Imperative

Science

Data Products

Science Data System

Cal/Val

Working Groups

Meetings & Workshops

Science Calendar

Team

Applications

Applications Working Group (AppWG)

SMAP has the potential to enable a diverse range of applications including drought and flood guidance, agricultural productivity estimation, weather forecasting, climate predictions, human health risk, and defense systems. Applications across agencies are a unique feature of SMAP. Some of these applications are summarized on the [Applications](#) page.

Planning for SMAP applications has been initiated to identify early adopters, current partners, and future potential users of SMAP data. A SMAP Applications Working Group (AppWG) has been formed that includes the following objectives:

- Assess current applications benefits and requirements for SMAP products
- Develop a community of end-users that understand SMAP capabilities and are interested in using SMAP products in their application
- Target partners who can work with the SMAP project during the pre-launch period, particularly to assess impacts on their applications
- Provide information about SMAP to the broad user community

SMAP AppWG activities will be carried out mainly through emails and telecons. The AppWG will also take advantage of member attendance at conferences such as AGU and IGARSS to meet in person when possible.

Earth Science Applications: Water Resources Solicitation: NNH11ZDA001N-WATER

This solicitation is specifically focused on the ability of organizations (public and private) to leverage NASA capabilities in order to advance their skill to monitor, identify, assess, predict, and respond to water resource deficits. Furthermore, this solicitation will seek the development of sustainable solutions that incorporate solid business/organization models that strive to incorporate performance metrics, fiscal realism of sustained operations, and the vision to meet the drought challenges of both today and in the future.

This solicitation will initially support one-year Feasibility studies of potential applications. NASA will then down-select and continue support of a subset of innovative, impactful applications in subsequent three-year Decisions efforts. The Decisions efforts develop the application with and transition to entities responsible for sustained operational support.



NOIs Due:
Close:

Jul 01, 2011
Sep 30, 2011



Applied Sciences Program

Discovering Innovative & Practical Applications of NASA Earth Science

HOME » Earth » Applied Sciences

Provide Feedback Share This

- Home
- About Applied Sciences
- Application Areas
- Capacity Building
- Solicitations
- Missions
- Documents & Reports
- Results & Highlights
- Community Library & Links
- Books
- Provide Feedback

Partner Spotlight

NASA partners with USAID to provide data into the Famine Early Warning System Network.

[read more...](#)

Search Applied Sciences

Search the Applied Sciences Website

all words
 any words
 exact phrase

Search the Applications Portfolio coming soon...



NASA Partnership Sends Earth Science Data to Africa

[read more...](#)

Welcome

The Applied Sciences Program promotes and funds activities to discover and demonstrate innovative uses and practical benefits of NASA Earth science data, scientific knowledge, and technology. The Program's portfolio of projects deliver results in applying NASA Earth science to support improvements in aviation safety, malaria early warning, agricultural productivity, water management, earthquake response, and many other important topics.

Earth Science Serves Society

The Applied Sciences Program partners with public and private organizations on ways to apply data from NASA's environmental satellites and scientific findings in their decision-making activities and services, helping to improve the quality of life and strengthen the economy.

Applied Sciences Program Areas



Applications Areas:

The Program focuses on economic, health, natural resources, and other themes to support both applied research and targeted, decision-support projects in 8 areas of national priority.



Capacity Building:

The Program sponsors specific activities to improve skills and capabilities in the US and developing countries on how to access and apply environmental satellite data, including DEVELOP, SERVIR, and the Gulf of Mexico Initiative.

News & Events

- The Value of Information Findings - PDF
- NASA data used to help avert famine
- NASA studies air quality using satellites in space
- Gulf Oil Spill Satellite Time

- + News Archive
- + Blog Archive
- + Events Archive

Applied Sciences Calendar

Calendar: Earth Science Events for 2010

[+ Visit Calendar](#)



<http://appliedsciences.nasa.gov/>

