



NASA Public Health Applications Program 2011 Program Review

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Program Review Goals

- Update and current status of ongoing projects
- Introduction of recently selected projects (ROSES 10 – Public Health Feasibility)
- Discussion of potential topics in ROSES 11/12
- Investigation of collaborative opportunities, including possible joint solicitations; leveraging existing programs (SERVIR, etc.)



2010 NASA Science Plan

The 2010 Science Plan identifies the direction NASA has received from the Administration and Congress, advice received from the nation's science community, principles and strategies guiding the conduct of our activities, and challenges we face. The plan that results enables NASA, as Administrator Bolden says, to "do the best science, not just more science."

The NASA Earth Science strategic goal is stated as, ***“Advance Earth System Science to meet the challenges of climate and environmental change.”***

http://science.nasa.gov/media/medialibrary/2010/08/30/2010SciencePlan_TAGGED.pdf



Earth System Science



Sun- Earth
Connection

Climate Variability
and Change

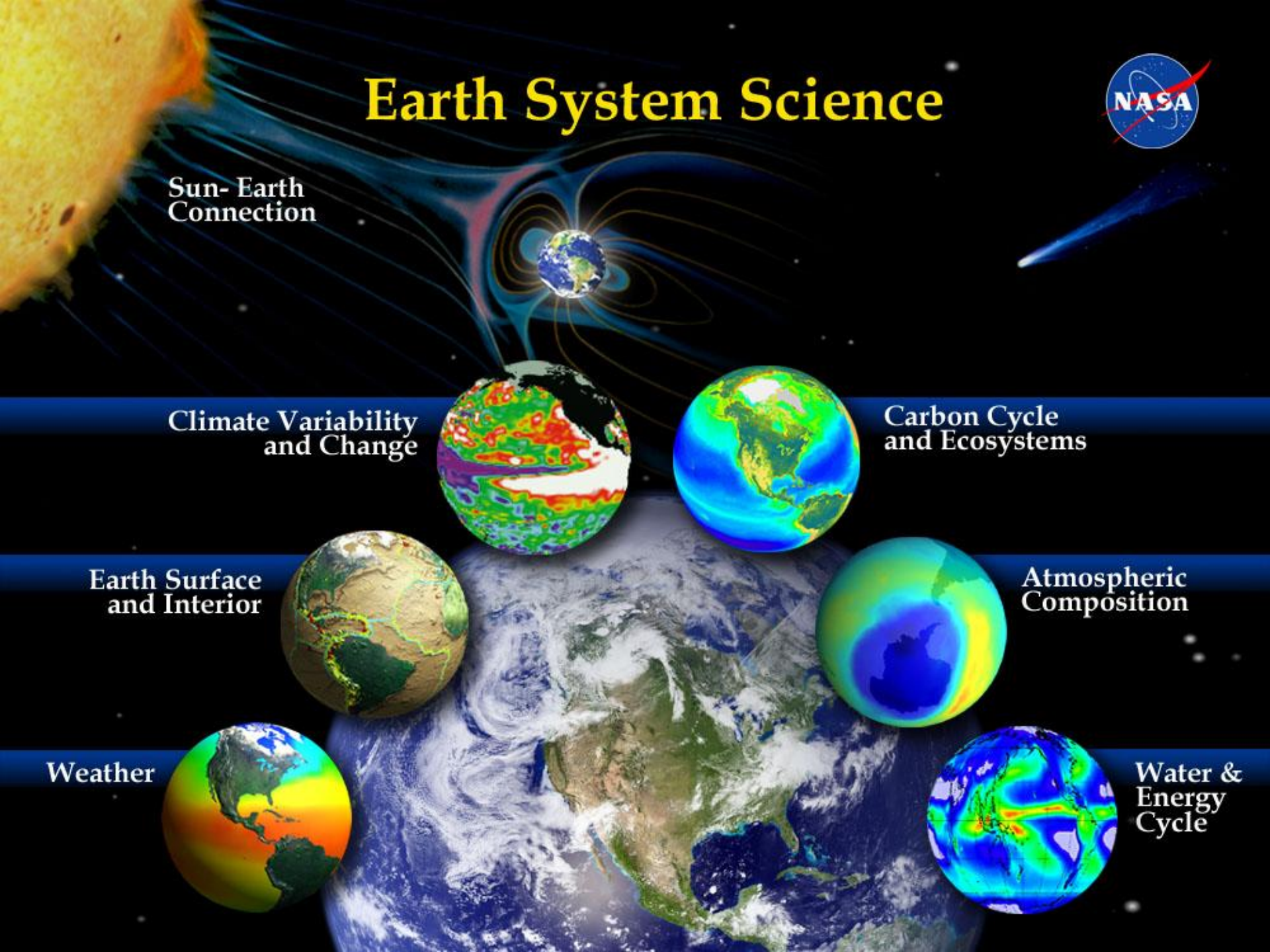
Carbon Cycle
and Ecosystems

Earth Surface
and Interior

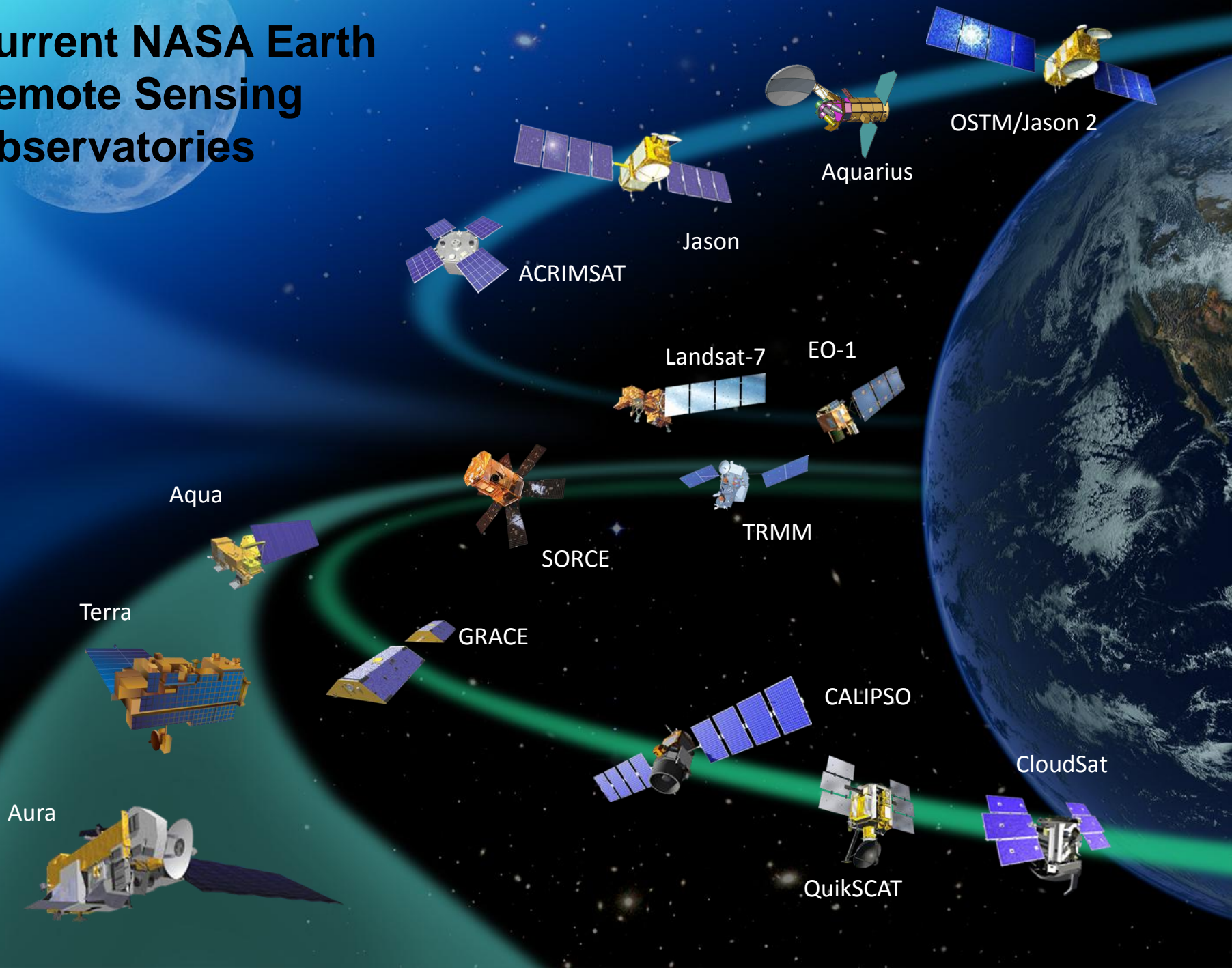
Atmospheric
Composition

Weather

Water &
Energy
Cycle



Current NASA Earth Remote Sensing Observatories



NASA Earth Science Division FY12 President's Budget

(\$ millions)

- FY11: \$1,801.8
- FY12: \$1,797.4
- FY13: \$1,821.7
- FY14: \$1,818.5
- FY15: \$1,858.2
- FY16: \$1,915.4

■ Major Items:

- President's Budget requests \$36.4M for ASP in FY12 rising to \$41.1M in FY16
- GPM LIO cancelled
- CLARREO/DESDyNI Phase A pushed out until FY17
- DESDyNI LIDAR cancelled – international contribution encouraged



News Items in the ESD/ASP during 2010-11

- Lawrence Friedl named as Associate Director of ASP in 2011.
- Four applications areas will be emphasized beginning in FY12. As part of this prioritization, the Air Quality and Public Health Applications areas will merge. The four priority applications areas will be Health and Air Quality, Ecological Forecasting, Disaster Management, and Water Resources.
- Nine new competitively selected grants were awarded in the Public Health Applications program through NASA ROSES 2010. New Health and Air Quality solicitation expected no later than February 2012 (ROSES 12). Likely that this solicitation will be issued earlier -- in November 2011 (ROSES 11).
- Establishment of Application Readiness Levels (ARLs)
 - *Application Readiness Level (ARL) is an Adapted Technology Readiness Level (TRL) for use in applications of Earth science to decision-making activities. The ARL assesses the maturity of Earth science applications projects and allows NASA to track integration of Earth science into decision-making by articulating expected advancement along a continuum from science to sustainable operations.*
- New ASP Communications Manager – Andrea Martin
- Expected establishment in September 2011 of a Standing Committee on Environment and Health in the American Meteorological Society.
- GEO Health CoP Meeting in Geneva, Switzerland (March 2011)
- Loss of Glory on launch in March 2011.
- Launch of Aquarius in June 2011.
- Expected launch of NPP in October 2011.





NASA 2011 Earth Science Senior Review

- NASA Earth Science Division (ESD) is supporting 12 Earth observing missions that are (or soon will be) operating beyond their prime mission lifetimes.
 - Each mission has made unique contributions to NASA research objectives.
 - Mission extensions have great potential for advancing NASA ESD science goals.
 - Data from many of these research missions are used routinely by other US agencies and institutions in support of national operational/non-research goals.
- Extended operations and associated data production activities require a significant fraction of the annual Earth Science budget.
- NASA/ESD periodically evaluates the allocation of mission operations and data analysis funds with the aim of maximizing the missions' contributions to NASA and National goals. This is known as the Senior Review.
- Final Report can be found at the following URL:
http://science.nasa.gov/media/medialibrary/2011/07/22/2011-NASA-ESSR-v3-CY-CleanCopy_3x.pdf



2011 Senior Review Panels

- Senior Science Panel
 - Primary independent analysis group
 - Sole responsibility to evaluate the scientific merit of the NASA mission, based on the applicability of the mission's science to NASA Earth Science strategic plans and objectives.
 - Incorporates the findings of the National Interests Panel and the technical/cost experts in final review ratings.
- National Interests Panel
 - Assesses the utility of the NASA research mission data products for non-research uses that advance national goals and operational objectives.
- Technical and Cost Experts
 - Assesses risk of mission failure and performance degradation
 - Assesses effectiveness of past cost performance and reasonableness of cost request.



Earth Science Senior Review

National Interests Panel

National Interests of the proposed mission extension

The National Interests Review assessed the contributions of the core data products to national objectives by assigning a utility value to each product or group of products.

Overall, this panel conveys to ESD & the Science Panel the value of the data sets for “applied and operational uses” that serve national interests, including operational uses, public services, business and economic uses, military operations, government management, policy making, nongovernmental organizations’ uses, etc.

Essentially, this panel represents all users of the data for primarily non-research purposes.

Panel met April 12-13, 2011, in Arlington, VA



Earth Science Senior Review

National Interests Panel

NASA 2011 Earth Science Senior Review <i>National Interests Panel</i>		
Rating	Definition	Missions
Very High Utility	These missions have one or more very relevant and highly valued data products which are routinely used by one or more of the participating organizations for important activities. Loss of the data product(s) would have a significant negative impact on national agencies and organizations.	<i>Aqua, Jason-2/OSTM, Terra</i>
High Utility	These missions have one or more data products which are routinely used by one or more of the participating organizations for their activities. Loss of the data product(s) would have a measurable negative impact on national agencies and organizations.	<i>Aura, CALIPSO, CloudSAT, EO-1, GRACE, Jason-1, QuikSCAT, SORCE, TRMM</i>
Some Utility	These missions have one or more data products which are used by one or more of the participating organizations. Loss of the data product(s) would have a small but measurable negative impact on national agencies and organizations.	<i>None</i>
Not Applicable (aka, Minor / Negilible)	These missions had no identified or significant applied or operational utility to the participating organizations. Loss of the data product(s) would have no or neglible negative impact on national agencies and organizations.	<i>None</i>

Post-Panel Discussion Utility Rating of Missions, by Organization												
Panel	Civil Agencies						Military / Intelligence Community		State & Locals	Private Sector / NGOs		
	A	B	C	D	E	F	G	H	I	J	K	L
	NOAA NWS	NOAA NESDIS	FAA	USDA	USGS	EPA	NRL	DOD/USAF	NSGIC	Con. Intl.	AIAA	ASPRS
Aqua	Aqua	Aqua	Aqua	Terra	Terra	Terra	Aqua	Aqua	Terra	Terra	Aqua	Terra
Terra	Terra	Terra	CloudSAT	Aqua	Aqua	Aqua	Terra	Terra	GRACE	Aqua	Jason-2/OSTM	Aqua
TRMM	SORCE	SORCE	Terra	Jason-1	EO-1	CALIPSO	TRMM	TRMM	Aqua	TRMM	Aura	Aura
Jason-2/OSTM	TRMM	Jason-2/OSTM	Aura	Jason-2/OSTM	Jason-2/OSTM	AURA	CloudSAT	Aura	Jason-2/OSTM	Jason-2/OSTM	Terra	Jason-2/OSTM
Aura	Jason-2/OSTM	TRMM	TRMM	Aura	TRMM	EO-1	CALIPSO	CloudSAT	Jason-1	Jason-1	TRMM	TRMM
CloudSAT	CloudSAT	QuickSCAT	QuickSCAT	TRMM	GRACE	TRMM	SORCE	SORCE	QuickSCAT	EO-1	GRACE	CALIPSO
GRACE	Jason-1	GRACE	CALIPSO	EO-1	SORCE	QuickSCAT	Jason-2/OSTM	GRACE	TRMM	Aura	QuickSCAT	CloudSAT
SORCE	Aura	Aura	EO-1	CALIPSO	QuickSCAT	CloudSAT	Jason-1	Jason-2/OSTM	Aura	CloudSAT	SORCE	Jason-1
CALIPSO	GRACE	Jason-1	SORCE	GRACE	Aura	GRACE	GRACE	QuickSCAT	CALIPSO	GRACE	CloudSAT	GRACE
Jason-1	QuickSCAT	CloudSAT	Jason-2/OSTM	SORCE	CloudSAT	SORCE	Aura	CALIPSO	EO-1	CALIPSO	CALIPSO	EO-1
QuickSCAT	CALIPSO	CALIPSO	GRACE	CloudSAT	CALIPSO	Jason-2/OSTM	QuickSCAT	Jason-1	CloudSAT	QuickSCAT	Jason-1	SORCE
EO-1	EO-1	EO-1	Jason-1	QuickSCAT	Jason-1	Jason-1	EO-1	EO-1	SORCE	SORCE	EO-1	QuickSCAT
Very High				High			Some			Not Applic./Neglig.		

Earth Science Senior Review

National Interests Panel

Post-Panel Ranking of Missions

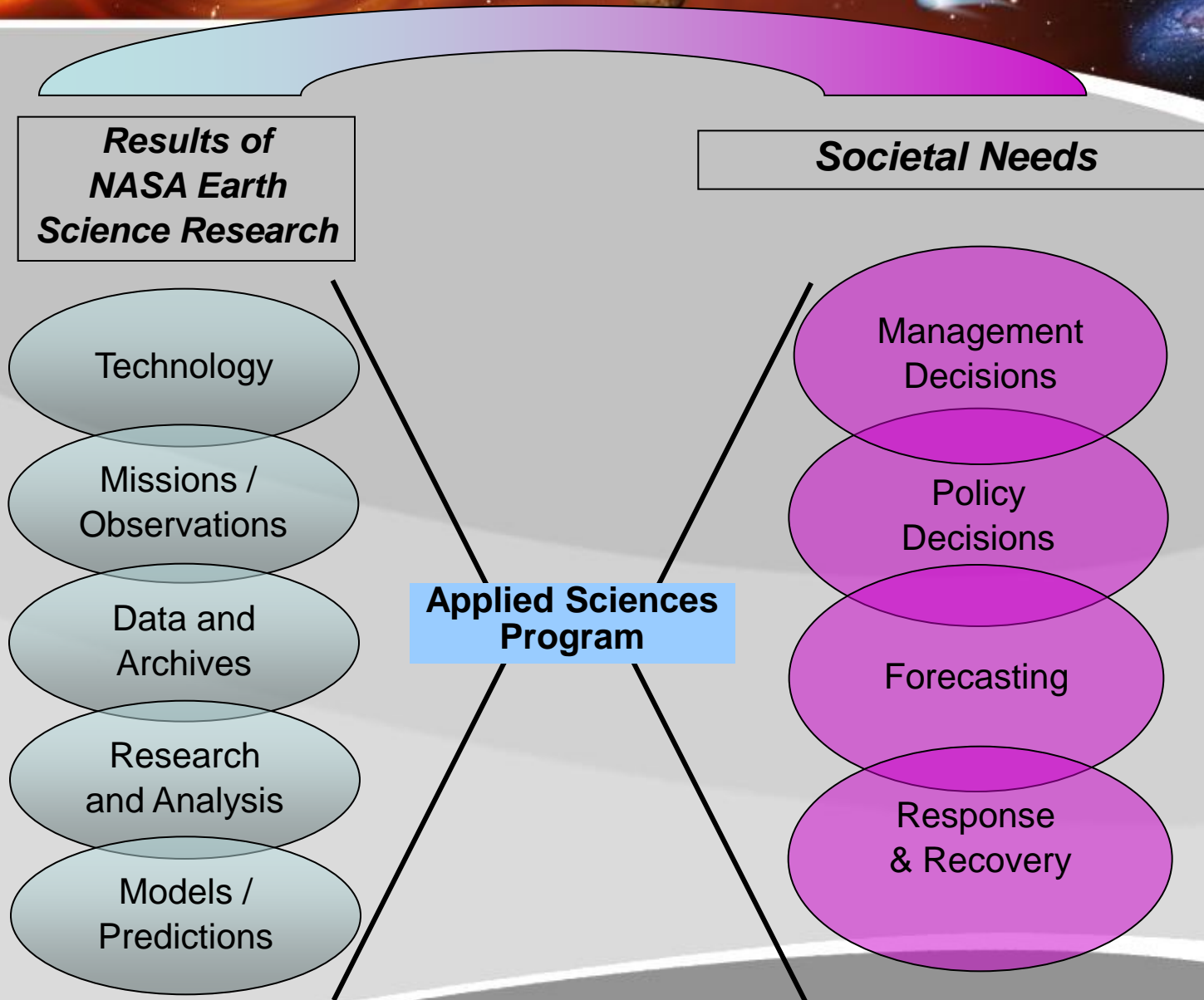
Mission	Overall Score	Utility Score
Aqua	137	Very High
Terra	135	Very High
TRMM	99	High
Jason-2/OSTM	89	Very High
Aura	83	High
Cloudsat	65	High
GRACE	63	High
SORCE	59	High
CALIPSO	55	High
Jason-1	53	High
QuickSCAT	51	High
EO-1	47	High

NASA Applied Sciences Program Mission Statement

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 – Aligned with
GEO SBAs*



**Agricultural
Efficiency**



Air Quality



Climate



**Disaster
Management**



**Ecological
Forecasting**



Public Health



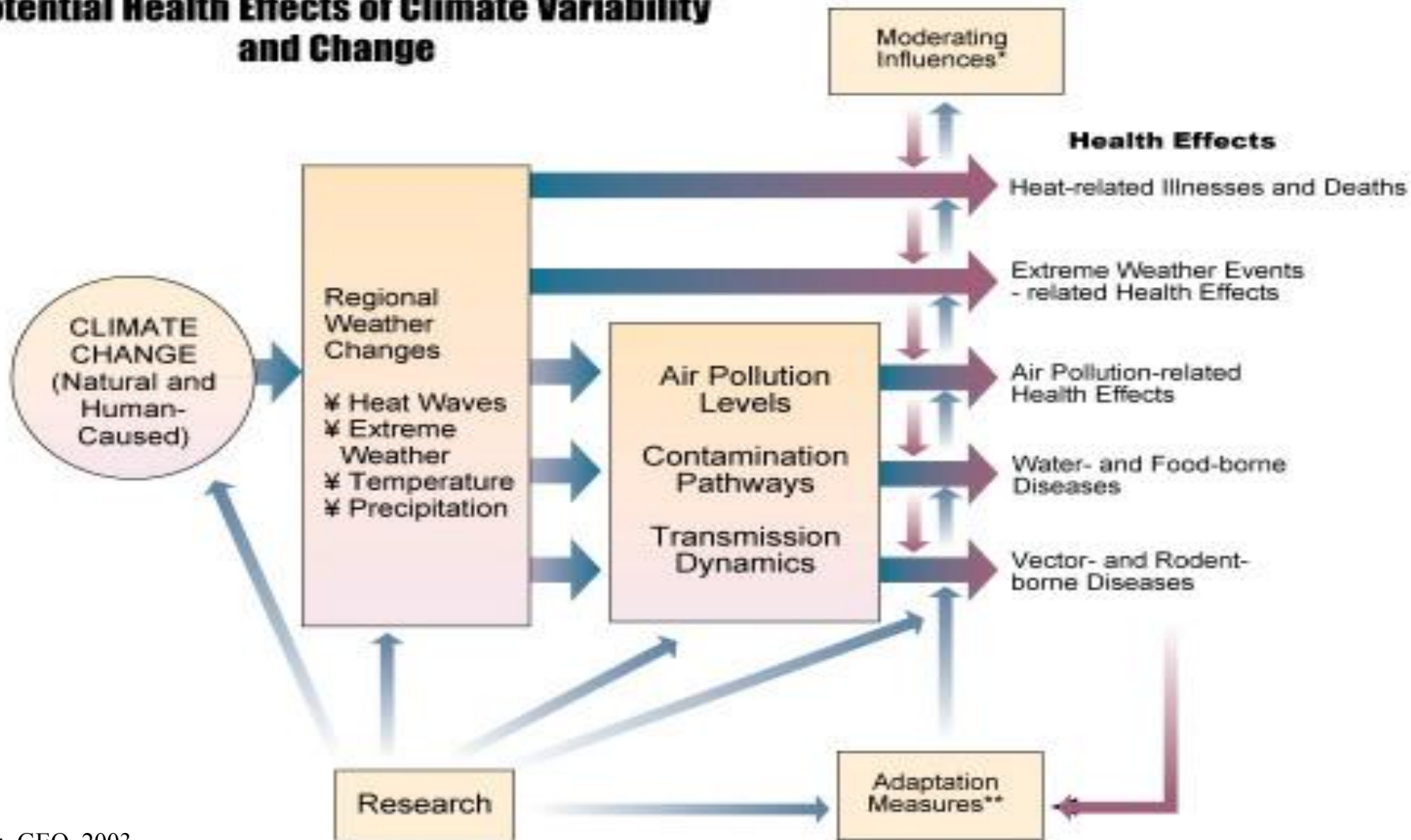
**Water
Resources**



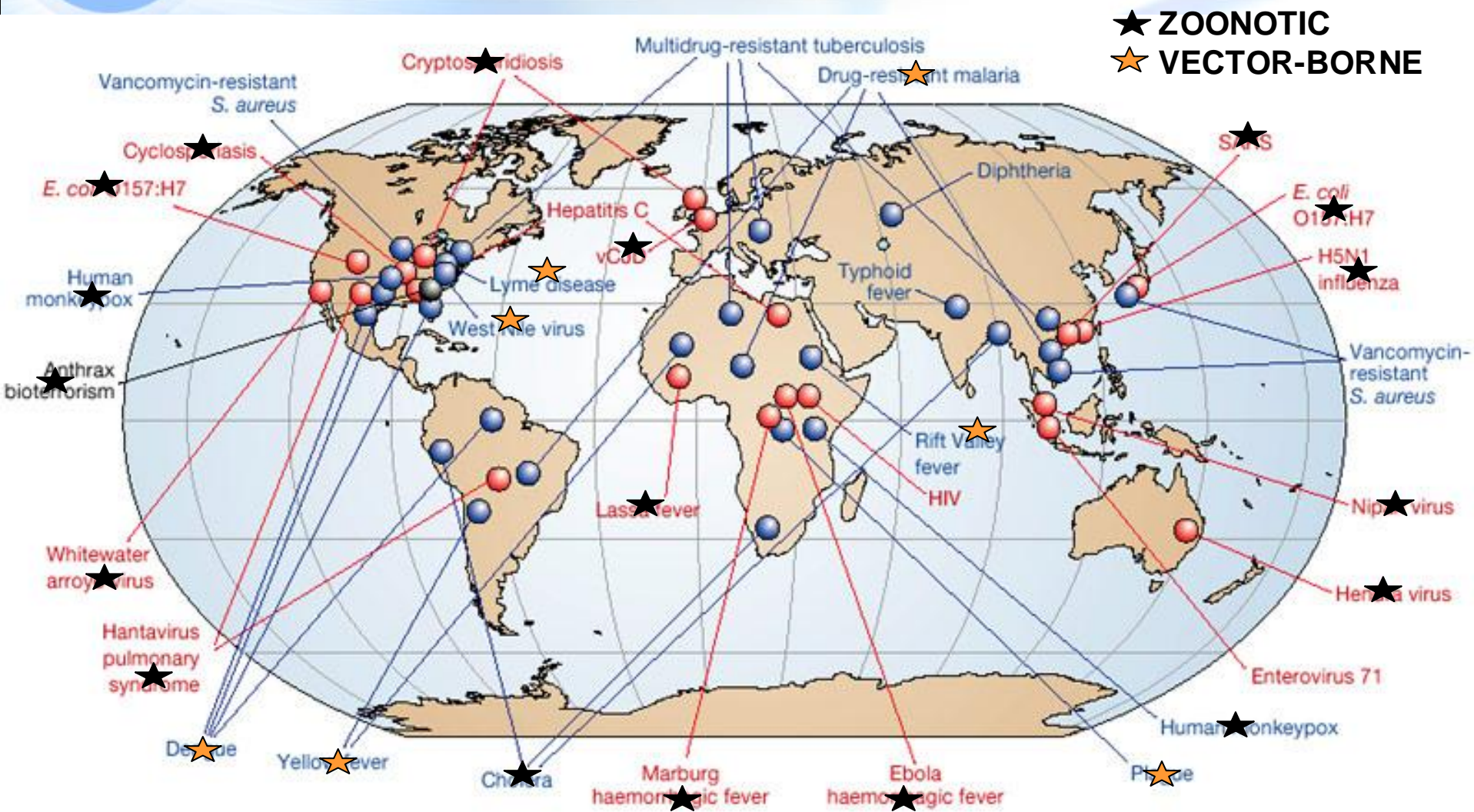
Weather

Why public health?

Potential Health Effects of Climate Variability and Change



Global Emerging Diseases*



EMERGING
RE-EMERGING

* Modified from Morens et al. 2004 *Nature* 430:242



New Environmental Threats



This visible image of the Gulf oil slick was taken on May 9 at 19:05 UTC (3:05 p.m. EDT) from MODIS aboard NASA's Aqua satellite. Crude oil brings volatile organic compounds into the air which can react with nitrogen oxides to produce ozone.



The Public Health application area focuses on Earth science applications to public health and safety, particularly regarding ***infectious disease, emergency preparedness and response, and environmental health issues***. The application explores issues of toxic and pathogenic exposure, as well as natural and man-made hazards and their effects, for risk characterization/mitigation and improvements to health and safety.

Goals

- Collaboration with other agencies to define the impact of climate change on public health
- Integration of NASA research into Public Health Information/Tracking Networks with the ability to track weather, climate, and environmental factors to improve disease outbreak and environmental health risk predictions to increase the public's warning time
- NASA research utilized to enhance our nation's emergency response and preparedness
- Issue joint solicitations with other agencies (e.g., CDC)
- Focus on upcoming missions (Decadal Survey)
- Through community, stay abreast and ahead of emerging diseases/issues

Major Federal Partners: CDC, EPA, DOD, USGS, USAID



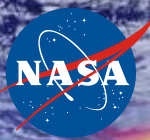
Applied Sciences/Public Health – 2010 Solicitation

ROSES-2010

A.31 Earth Science Applications Feasibility Studies: Public Health

Seeks proposals to perform short-term, feasibility studies of applications of Earth science research results that will improve decision-making activities in the focus area of Public Health.

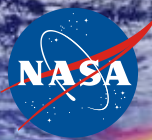
The overall objective of these projects is to generate and test preliminary ideas for applications of Earth science products to determine their potential value and readiness for a more in-depth project.



Distribution of Total Proposals, by PI organization – (A.31)

Applied Sciences - ROSES-10 A.31 PH		
Total Proposals, by PI Organization		
	Submitted	
Total Proposals	24	
By PI Organization	Proposals Submitted	% of Total Submitted
NASA	3	13%
Academia	14	58%
Other Fed	1	4%
Private (NGO/Industry)	6	25%

Selected: 9
38% of Total
Proposals



Distribution of Recommended Selections (by PI organization) – A.31

Applied Sciences - ROSES-10 A.31 Public Health

Proposals by PI Organization (Total Proposals: 24)

PI Organization	Proposals Submitted	Selected	% Selected of Those Submitted	Total # of Awards	% Selected of Total Awards
NASA	3	1	33%	9	11%
Academia	14	5	36%		56%
Other Fed	1	0	0%		0%
Private (NGO/Industry)	6	3	50%		33%

New NASA Public Health Applications Projects Awarded in January 2011

- Nine new Public Health Applications projects were awarded by NASA in January 2011 representing an investment of over \$1.3M over two years.
- List of Projects:
 - “Development of a Detection and Early Warning System for Malaria Risk in the Amazon”; PI: Benjamin Zatichik of Johns Hopkins University
 - “Improving Decision-Making Activities for Malaria and Meningitis Risk Mapping – Integration of NASA Products/Platforms (SERVIR) and UN WHO-Open Health”; PI: Pietro Ceccato of Columbia University
 - “Integrating Earth Observations and Satellite Telemetry of Wild Birds for Decision Support System of Avian Influenza”; PI: Xiangming Xiao of the Univ. of Oklahoma
 - “Modeling Global Influenza Risks Using NASA Data”; PI: Richard Kiang of NASA Goddard Space Flight Center
 - “Investigating the Potential Range Expansion of the Vector Mosquito *Aedes Aegypti* in Mexico”; PI: Bill Crosson of USRA



New NASA Public Health Applications Projects Awarded in January 2011

■ List of Projects continued:

- “Feasibility Study of Satellite Assisted Detection and Forecasting of Oyster Norovirus Outbreak”; PI: Zhiqiang Deng of Louisiana State University
- “Using NASA Satellite AOD Data to Create Representative PM2.5 Fields for Use in Human Health and Epidemiology Studies”; PI: Amy Huff of Battelle
- “Internet-based Heat Evaluation and Assessment Tool (I-HEAT)”; PI: Susan Maxwell of BioMedWare
- “Enhanced Forecasting of Mosquito-Borne Disease Outbreaks Using AMSR-E”; PI: Michael Wimberly of South Dakota State University



NASA's Public Health Partners

.gov/ph



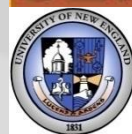
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.org



.edu



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.mil

Future Observations for Health – Near Term

- **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) constellation.
- **Landsat Data Continuity Mission (LDCM) -- 2012**
- **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.



Future Observations for Health – Decadal Survey

- **Hyperspectral Infrared Imager (HyspIRI) – ~2020**
 - 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) – 2014**
 - SMAP will use a combined radiometer and high-resolution radar to measure surface soil moisture and freeze-thaw state.



2011



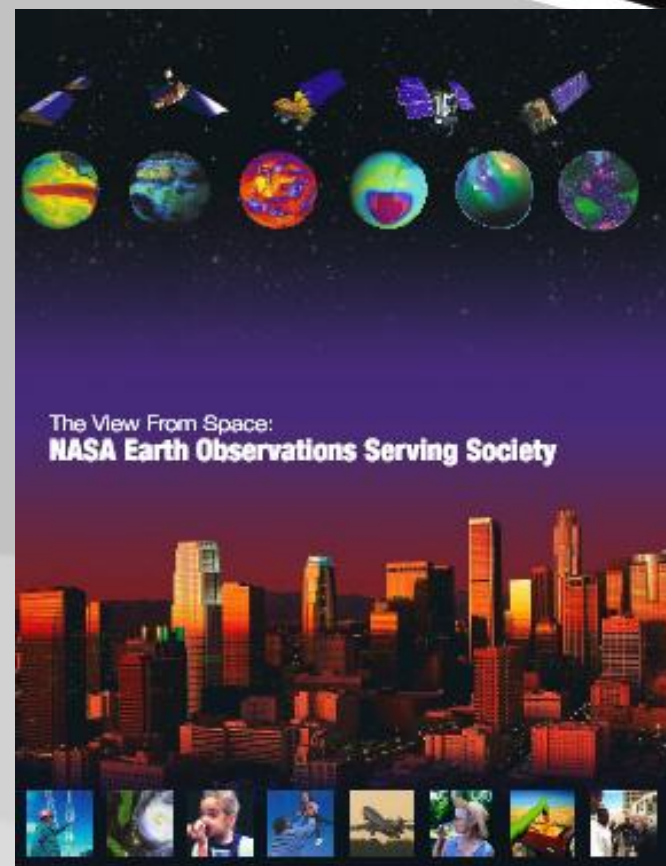
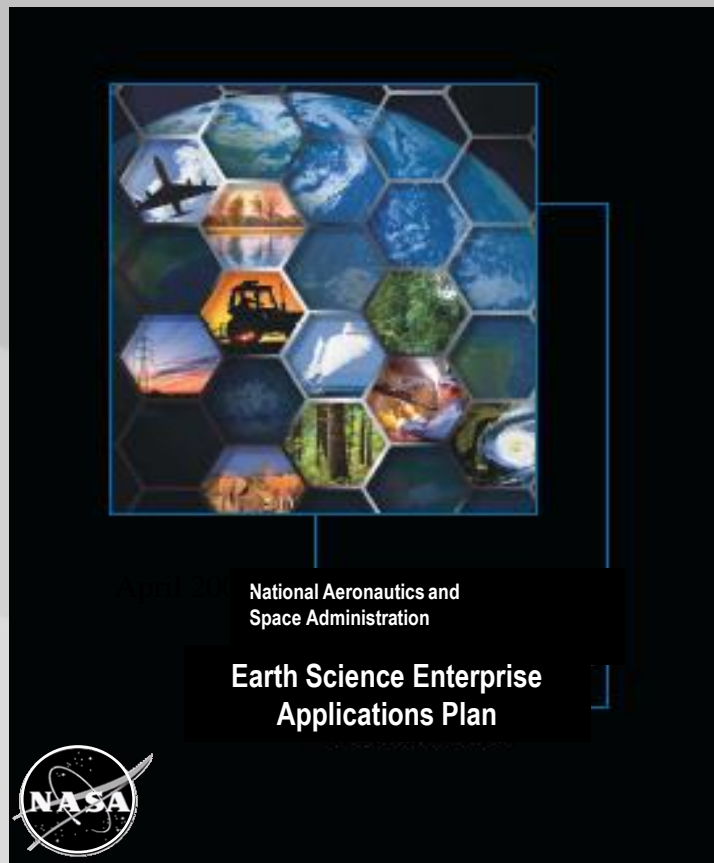
2012



2013



Applied Sciences Program



<http://appliedsciences.nasa.gov>

