



# **NASA Earth Science Decadal Survey Mission Development Symposium**

**Washington, DC  
February 11 - 12, 2009**



# Day 1 - Decadal Survey Missions February 11, 2009



## Conducting the Symposium



- ◆ We are discussing works in progress, with our best understanding at this time
  - *The data and results we present represent our best understanding at this time, and are subject to change as we learn more*
  
- ◆ Everyone is expected to participate, with the emphasis on exchange of ideas, and open communication
  
- ◆ This is not a decisional meeting. Each mission team has been given authority to proceed with their FY09 plans already.
  - *We will discuss and consider proposed changes that exceed the current plan, but not make any allocation changes at this meeting*
  
- ◆ A Symposium report will follow in a few weeks
  - *Minutes or assessments will be routed through the mission study teams for comments & corrections (provided they get them back quickly enough).*
  - *All charts will be available on the ESM Program Office website*



## Decadal Survey Symposium Objectives



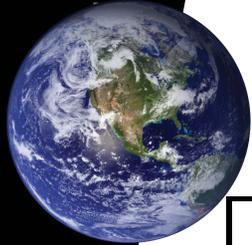
1. To (re)convene the multiple study groups for a joint and common assessment of their mission development progress through FY08
  - *For many in the meeting this is a follow-up to the initial mission studies kick-off (March 22) and ESD Steering Committee (May 22) meetings*
  - *For the broader group this is our first gathering*
2. To review and understand the study teams' objectives for mission development through the remainder of FY09 and into the beginning of FY10
3. To present for general education and discussion the study teams' approaches to achieving their mission development objectives
  - *This meeting is intended as an opportunity for lessons learned discussion and exchange among teams*
4. To present for consideration and discussion proposed cross cutting studies and analyses.
  - *Their importance (have we prioritized them correctly?),*
  - *Their appropriateness (are they best done at a program level?), and*
  - *Their completeness (have we missed anything both important and pressing?)*

# Day 1 Agenda



Day 1: February 11, 2009 Decadal Survey Missions			
Time	Subject	Presenter	Duration
8:15	HQ Welcome & overview	Steve Volz	5
8:20	Meeting Goals & Objectives	Mike Freilich	15
8:35	DS Status Overview	Volz	25
<b>Tire 1 Missions Part 1</b>			
9:00	SMAP	<i>TBD</i>	40
9:40	ICESat II	<i>TBD</i>	40
10:20	Lessons getting to KDP-A & MCR	ESD/ESM PO	15
10:30	Break		15
<b>Tier 1 Missions Part 2</b>			
10:45	DESDynI	<i>TBD</i>	30
11:25	CLARREO	<i>TBD</i>	30
12:05	Lunch		60
<b>Tier 2 Missions</b>			
1:05	Tier 2 Overview	ESD	10
1:15	ESTO DS Investments	ESTO	20
1:45	ACE	<i>TBD</i>	30
2:15	ASCENDS	<i>TBD</i>	30
2:45	Break		15
3:00	GEOCAPE	<i>TBD</i>	30
3:30	HysPIRI	<i>TBD</i>	30
4:00	SWOT	<i>TBD</i>	30
4:30	Day 1 Summary	Volz	30

# Day 2 Agenda



Day 2: February 12, 2009 Decadal Survey Program			
Time	Subject	Presenter	Duration
8:00	DS Program Implementation	Volz	60
9:00	Cross Mission Requirements	ESD	30
9:30	Cross Mission Assessments	ESMPO	45
10:15	Break		15
10:30	Cross Mission Synergy Discussion	All	60
11:30	Summary & Actions	ESD	30
12:00	Symposium Close		

- ◆ Focus of Day 2 is on cross mission issues and opportunities
- ◆ Next Steps



# Where do we want to be by October 1, 2008?



- ◆ Completion of FY08 activities and refinement of FY09 study plans
- ◆ End-of-year results Decadal Survey “Symposium”
  - *Each mission study team and by the Earth Systematic Missions Program Office on the results of FY08 Decadal Survey mission activities*
  - *Audience to be the ESD and the other mission study teams*
  - *Presentations to cover:*
    - ◆ Study plans and objectives
    - ◆ Studies accomplished and study results
    - ◆ Studies in process
    - ◆ FY09 study plans
- ◆ Refinement of FY09 Study plan
  - *Task and budget assignments for all activities including: task description, completion schedule, funding requirements and task deliverable(s)*
  - *Quantitative assessment of the degree to which objectives and deliverables for KDP-A will be completed by the end of FY09*
- ◆ Cross-cutting Mission studies Definition
  - *Task and budget assignments for all cross cutting activities including the same detail as the mission studies*

Presented May 22, 2008



## Where do we want to be by October 1, 2009?



- ◆ Evaluation of formulation readiness for all missions under study
- ◆ Quantitative assessment of each mission's readiness to proceed to Phase A
  - *Technology readiness*
  - *Revised cost and schedule, possibly including independent cot and schedule assessment (depending on overall maturity and readiness)*
  - *KDP-A documentation completeness*
  - *Draft level 1 requirements status*
  - *Mission concept of operations*
- ◆ Mission maturation plan for FY10 and beyond
  - *Identification of highest priority activities*
- ◆ Decadal Survey Program assessment
  - *Cross cutting mission analyses*
  - *Coordinated activities: Launch vehicles*
  - *Constellation measurement requirements*
  - *Other Decadal Survey program needs: Venture class, ground systems, ground networks*

Presented May 22, 2008



## Have our plans changed since May 22, 2008?



- ◆ We are in the middle of a great deal of Budget Uncertainty. However, for now we continue to work to the same budget we had last May.
- ◆ We must be prepared for a variety of possible budget and programmatic futures, all with additional funds allocated to ESD in general and to the Decadal Survey missions in particular
- ◆ We may receive additional funding - through a Stimulus, an FY09 budget, and/or an updated FY10 and beyond budget - and need to be prepared for that possibility.
- ◆ All involved in the DS mission development have been asked to consider how they would benefit from additional near term funds, *but that is not the subject for this Symposium.*
- ◆ Today we should continue with the plans in place, focus on the progress made to date, and prepare for a better possible futures.



# ESD Decadal Execution



- ◆ All members of the mission study ESD teams should be involved in all relevant study discussions
- ◆ To the personnel listed below we can now add the Center, Academia, and Industry based participants, for those missions that are preparing aggressively for Formulation

PHASE	MISSION	PROGRAM SCIENTIST		PROGRAM EXECUTIVE	DATA SYSTEMS	APPLIED SCIENCE	ESTO	ESM PROGRAM OFFICE
		PRIMARY	BACKUP					
PRE-A	ICESAT II	WICKLAND (ACTING)		SLONAKER	LINDSAY	TURNER	BAUER	DIJOSEPH
A	SMAP	ENTIN	KAKAR	IANSON		HAYNES		SAVINELL
PRE-A	DESDYNI	LABRECQUE	WICKLAND	VOLZ	MAIDEN	DONNELLAN	BOB SMITH	BOB SMITH
PRE-A	CLARREO	ANDERSON	KAKAR	CARSON		FRIEDL	GHUMAN	WALKER
PRE-A	SWOT	LINDSTROM	ENTIN	NEECK	MAIDEN	HAYNES	BOB SMITH	
	HYSPIRI	TURNER	LABRECQUE			HAYNES		
	ASCENDS	JUCKS	EMANUEL			TURNER		
	GEO-CAPE	JUCKS	BONTEMPI			FRIEDL		
	ACE	MARING	BONTEMPI			FRIEDL		
PRE-A	LIST	DOBSON	WICKLAND			TBD	PASCIUTO	
	PATH	KAKAR	MARING			HAYNES		
	GRACE-II	LABRECQUE	MARTIN			TBD		
	SCLP	ENTIN	MARTIN			TBD		
	GACM	JUCKS	HILSEN RATH			FRIEDL		
	3D-WINDS	KAKAR	ANDERSON			TBD		



# DS Mission Concept Development



- ◆ All named Decadal Survey missions are Strategic, directed missions
  - *Mission management will be assigned to a Facility (almost always a NASA Center)*
  - *Venture Class missions and ESTO technology initiatives are competed and will be addressed later in this presentation*
  
- ◆ Elements of the missions will be competed, some hardware built in house and other procured or developed in partnership with industry. Possible competed elements should include but are not limited to:
  - *Science Definition Teams*
  - *Instruments*
  - *Spacecraft (through RFP or RSDO approach)*
  
- ◆ We wish to develop the DS missions as part of an integrated overall Earth Science Program
  - *The ESM Program Office will lead and coordinate appropriate inter-mission analyses and trade studies (subject of Day 2 of Symposium)*



## Start & Expected End points vary w/DS Tier



- ◆ For Near-Term, Tier 1 missions
  - *Build on the Science workshops of 2007*
  - *Conduct focused studies, analyses, partnership investigations*
  - *Establish science study teams, first with ad hoc and then with competitively selected Science Definition Teams (SDT)*
  - *Conduct Mission Concept Review by close of FY09*
  
- ◆ For Mid-Term, Tier 2 missions
  - *Build on the results of the in-house mission studies*
  - *Conduct Science workshops*
  - *Establish mission study teams, with ad hoc Science study teams led by NASA but including Academia*
  - *Determine the mission readiness to proceed to Phase A*
  
- ◆ For Late-Term, Tier 3 missions
  - *Utilize Earth Science Technology Office (ESTO) calls to advance the technology readiness of the measurement technique, and*
  - *Leverage off science and mission definition development activities Tier 1 and 2 mission activities*



# NASA Community Engagement



- ◆ Competitively selected (through ROSES) Science Development Teams have been selected for the first two missions, SMAP and ICESat II.
- ◆ Similar calls for SDTs for CLARREO and DESDynI are planned for FY09.
- ◆ The workshops and science team meetings in general have been very helpful in informing the public, and should be continued

Date	Mission	Subject	Location	Contacts	
June 5-6	DESDynI	Science Steering Committee	Greenbelt, MD	John LaBrecque	<a href="mailto:john.labrecque@nasa.gov">john.labrecque@nasa.gov</a>
June 19-20	ACE	Opening Science Workshop	Greenbelt, MD	Hal Maring	<a href="mailto:hal.maring@nasa.gov">hal.maring@nasa.gov</a>
July 23-25	ASCENDS	Opening Science Workshop	Ann Arbor, MI	Ken Jucks	<a href="mailto:kenneth.w.jucks@nasa.gov">kenneth.w.jucks@nasa.gov</a>
August 18-20	GEO-CAPE	Opening Science Workshop	Chapel Hill, NC	Ken Jucks	<a href="mailto:kenneth.w.jucks@nasa.gov">kenneth.w.jucks@nasa.gov</a>
October 21-23	CLARREO	Science Working Group Mtg	Washington, DC	Don Anderson	<a href="mailto:donald.anderson-1@nasa.gov">donald.anderson-1@nasa.gov</a>
October 21-23	HyspIRI	Opening Science Workshop	Pasadena, CA	Woody Turner	<a href="mailto:woody.turner@nasa.gov">woody.turner@nasa.gov</a>
October 29-31	DESDynI	Applications Workshop	Sacramento, CA	Steve Ambrose	<a href="mailto:sambrose@nasa.gov">sambrose@nasa.gov</a>
December 18	DS Tier 1 & 2	Decadal Survey Town Hall	San Francisco, CA	Steve Volz	<a href="mailto:svolz@nasa.gov">svolz@nasa.gov</a>
January 26-28, 2009	SWOT	Science Workshop	Paris, France	Eric Lindstrom	<a href="mailto:eric.j.lindstrom@nasa.gov">eric.j.lindstrom@nasa.gov</a>
February 11-12, 2009	DS Tier 1 & 2	Decadal Survey Implementation Update	Washington, DC	Steve Volz	<a href="mailto:svolz@nasa.gov">svolz@nasa.gov</a>
March 10-12, 2009	ACE	Mission Formulation Workshop	TBD	Hal Maring	<a href="mailto:hal.maring@nasa.gov">hal.maring@nasa.gov</a>
June 22-24, 2009	SWOT	OSTST Mtg, SWG Mtg	Seattle, WA	Eric Lindstrom	<a href="mailto:eric.j.lindstrom@nasa.gov">eric.j.lindstrom@nasa.gov</a>
August 11-13, 2009	HyspIRI	Science Workshop	Pasadena, CA	Woody Turner	<a href="mailto:woody.turner@nasa.gov">woody.turner@nasa.gov</a>
August 2009	GEO-CAPE	Mission Definition Assessment Workshop	TBD	Ken Jucks	<a href="mailto:kenneth.w.jucks@nasa.gov">kenneth.w.jucks@nasa.gov</a>
September 2009	ASCENDS	Mission Definition Assessment Workshop	TBD	Ken Jucks	<a href="mailto:kenneth.w.jucks@nasa.gov">kenneth.w.jucks@nasa.gov</a>

*Note: Some of the meetings are focused working group meetings, and may not be open to the general public*



# Where do we want to be by October 1, 2009?



		SMAP	ICESat II	CLARREO	DESDyni	SWOT	ACE	ASCENDS	HyspIRI	GEO-CAPE
Pre-Phase A	Technology Assessment	Green	Light Green	Light Green	Light Green	Light Green	Yellow	Yellow	Yellow	
	Draft Level 1 requirements	Green	Green	Green	Green	Green	Yellow		Yellow	
	Acquision Strategy Planning	Green	Light Green	Light Green	Light Green	Light Green				
	Cost	Green	Light Green	Light Green	Light Green	Light Green				
	Schedule	Green	Light Green	Light Green	Light Green	Light Green				
	Formulation Authorization Document	Green	Light Green	Light Green	Light Green	Yellow				
	Mission Concept Study	Green	Green	Light Green	Light Green	Light Green	Yellow			
	Partnership Discussions	Green	Green	Yellow	Green	Green	Yellow		Yellow	
Mission Concept Review	Green	Light Green	Light Green	Light Green	Light Green	Yellow				
Phase A	Baseline Level 1	Green	Light Green	Yellow	Yellow	Yellow				
	System Requirements Review	Green	Light Green	Yellow						
	Mission Definition Review	Light Green	Light Green							
	System requirements flowdown	Green	Light Green	Yellow	Yellow					
	Initiate Interagency & International	Light Green	Light Green	Yellow	Yellow					
	Acquisition Strategy Meeting	Green	Light Green							
	Independent Cost	Light Green	Light Green							
	Independent Schedule	Light Green	Light Green							
	Comprehensive TRL assessment	Green	Light Green	Yellow	Yellow					
	Preliminary Project Plan	Green	Light Green							
	Integrated Baseline Review	Light Green	Light Green							

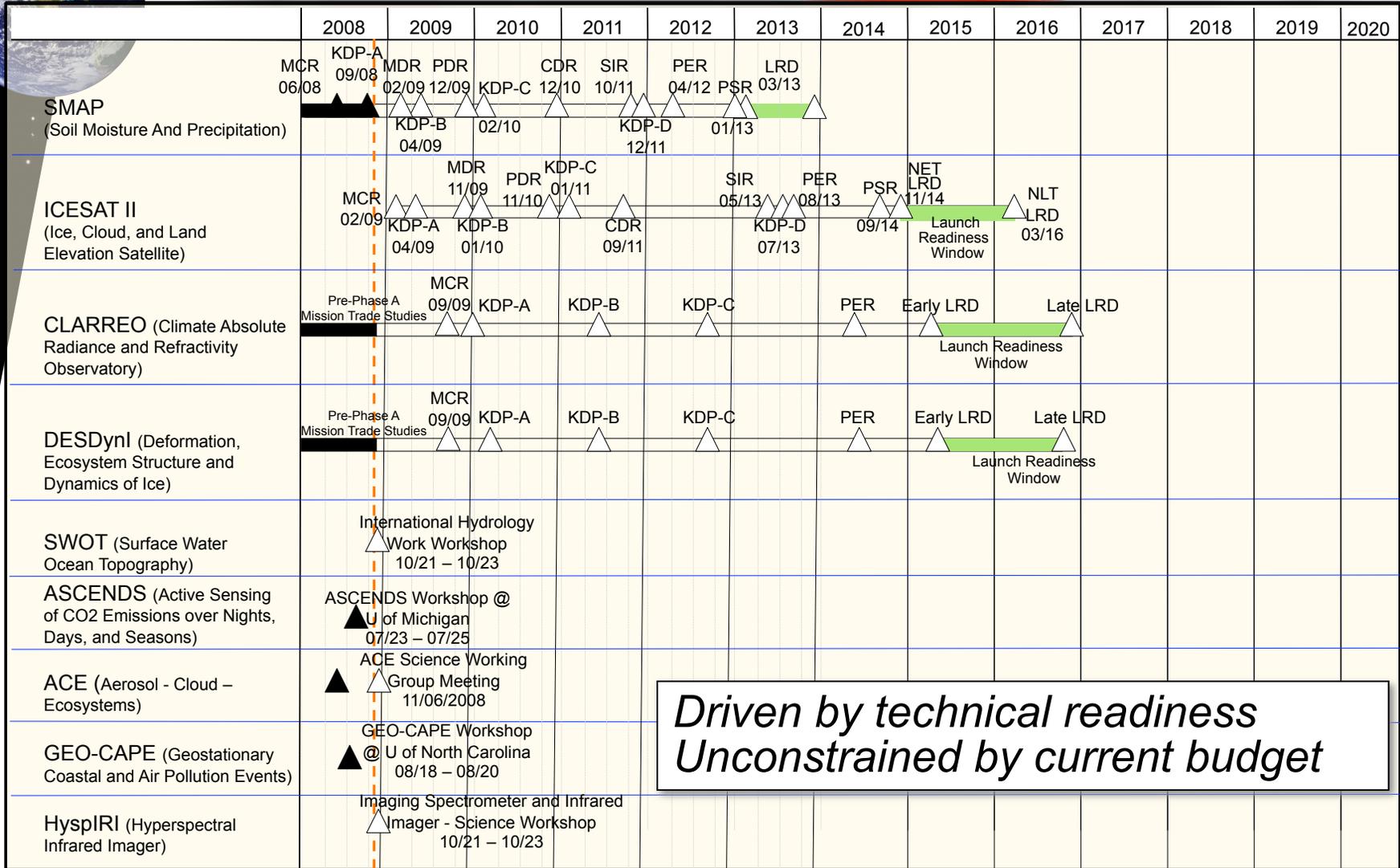
TBD

Activity at or very near completion   
 Activity initiated but with work remaining   
 Activity not begun or in very early stage

# Tier 1 & Tier 2 Notional Mission Readiness: When could we be ready to fly?



As of 10/14/2008



*Driven by technical readiness  
Unconstrained by current budget*

Milestone      Duration Bar      Progress/Status Bar  
 Completed Milestone      Study Phase