NASA Earth Science Division Overview:

Status, Constraints, and Challenges

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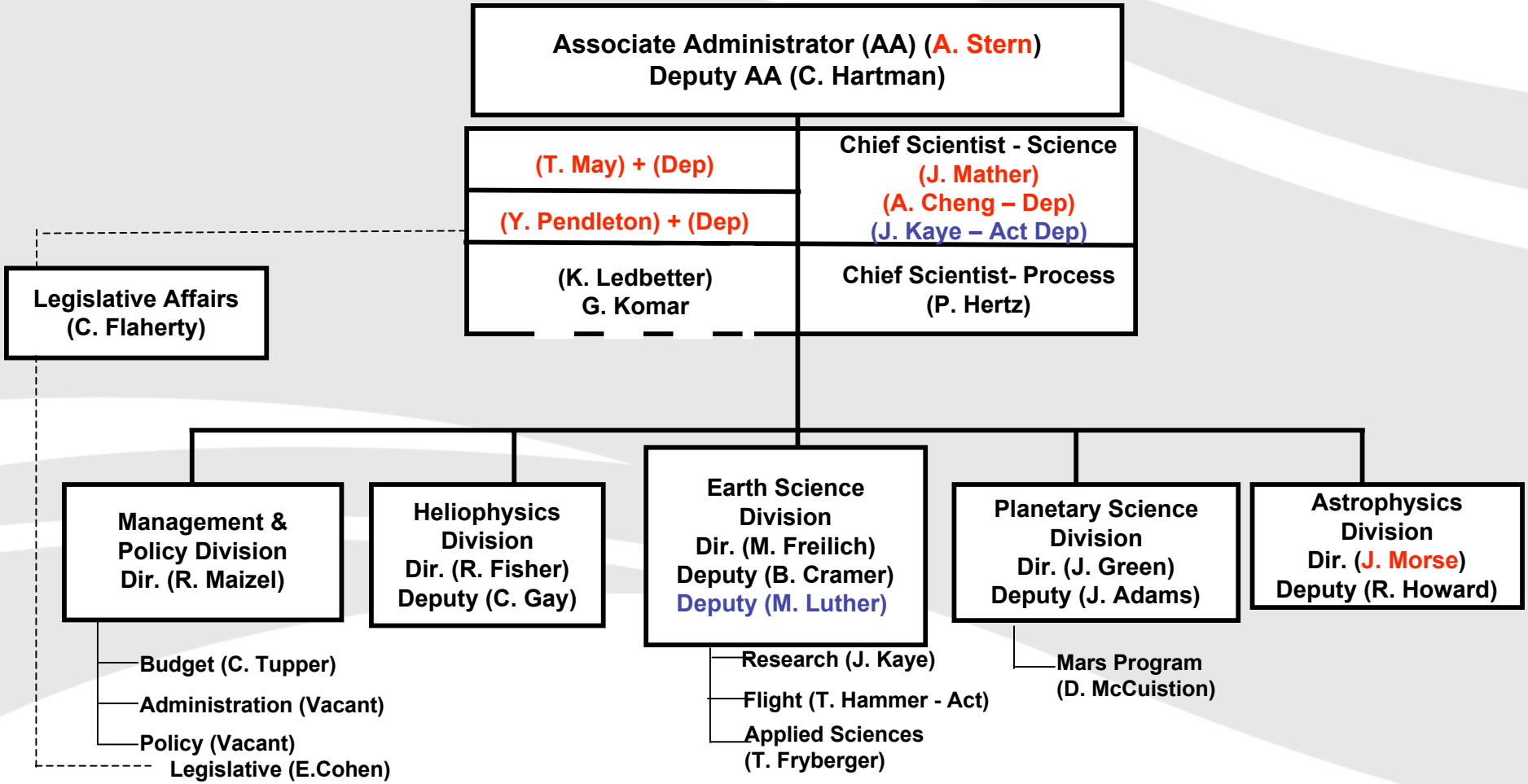
11 April 2007

Current SMD Organization



Earth Science FY2008 Budget (loaded)

	FY2006	* FY2007	FY2008	FY2009	FY2010	FY2011	FY2012	
FY08 Earth Science Budget	$1,325.6	$1,464.5	$1,497.3	$1,545.8	$1,520.1	$1,411.2	$1,353.2	
Earth Systematic Missions	$356.1	$523.8	$608.0	$693.0	$576.0	$387.9	$387.9	
Global Precipitation Measurement (GPM)	$23.4	$28.1	$90.2	$182.4	$208.8	$158.7	$163.7	
Glory Mission	$56.6	$60.0	$42.7	$32.7	$11.1	$11.3	$1.9	
Landsat Data Continuity Mission (LDCM)	$8.5	$113.5	$160.2	$192.6	$154.5	$38.7	$4.0	
Ocean Surface Topography Mission (OSTM)	$19.7	$47.0	$33.4	$8.7	$8.3	$8.2	$7.8	
NPOESS Preparatory Project (NPP)	$21.2	$80.1	$91.0	$93.6	$20.2	$6.8	$7.6	
Operating Missions / Data / Science	$226.7	$195.2	$190.4	$180.9	$123.6	$42.2	$42.4	
Senior Review Competed Science				$2.0	$48.8	$121.7	$129.8	
Decadal Survey Missions				$0.2	$0.7	$0.3	$30.6	31.8
Earth System Science Pathfinder	$133.4	$165.2	$135.7	$94.9	$171.6	$242.3	$161.2	
Orbiting Carbon Observatory (OCO)	$40.8	$75.7	$40.9	$12.6	$6.4			
Aquarius	$51.7	$73.4	$60.6	$33.5	$6.7	$4.8	$3.4	
Operating Missions / Data / Science	$37.8	$13.9	$24.9	$13.0	$7.3	$7.3	$7.3	
Senior Review Competed Science			$7.6	$13.4	$22.2	$28.3	$13.0	
Management / Future Missions	$3.1	$2.1	$1.6	$22.4	$128.9	$201.9	$137.5	492.3
Earth Science Research	$460.8	$453.4	$428.5	$453.0	$453.8	$469.1	$481.4	*406.4*
Earth R&A, EOS Research	$219.2	$224.9	$242.2	$249.1	$257.7	$258.4	$263.7	
Data / Science Teams	$40.6	$62.6	$26.0	$30.8	$34.5	$36.4	$37.6	
Suborbital Science Program	$32.2	$30.5	$31.7	$31.5	$31.3	$29.2	$32.1	
Computing + Directorate Support	$168.9	$135.3	$128.6	$141.6	$130.4	$145.1	$148.1	
Earth Science Multi-Mission Operations	$190.4	$192.9	$204.4	$181.3	$191.3	$185.8	$194.2	
Applied Sciences	$94.8	$46.8	$40.3	$41.3	$41.1	$38.0	$38.9	
Education and Outreach	$20.2	$25.9	$23.5	$23.6	$23.7	$23.9	$24.1	
Earth Science Technology	$69.9	$56.6	$57.0	$58.7	$62.6	$64.2	$65.5	

* FY2007 is President's Budget, adjusted for Full Cost Simplification. Does not reflect full-year CR or current planning.

Earth Science Division Overview (cont.)

7 programs:

- Earth Systematic Missions
- Earth System Science Pathfinder

} Flight mission lines 41%

- Research 30%
- Applied Sciences 3%
- Multi-Mission Operations (data systems) 14%
- Technology 5%
- Education and Outreach 2%

GUIDANCE, APPROACH, CONSTRAINTS

- **Decadal Survey**
  - First-ever guidance on Earth Science consensus priorities
  - 15 NASA missions in time sequence -- constellations
  - 12 other recommendations
  - Emphatic call for multi-dimensional balance

- **On-going Activities**
  - Cost refinement through Concept Studies at NASA Centers (GSFC, JPL)
    - Technical challenges, cost completeness (including science)
  - Mission Workshops for CLARREO, SMAP, ICESAT2, DesDynI
  - "Spreadsheet Engineering" to identify realistic budget/science scenarios
  - NPOESS climate sensor remanifestation scenarios
    - NASA-NOAA-OSTP study (early May)
    - NRC workshop report (mid-July)
  - Updated Earth Science Division Science Plan (July)
  - Draft NASA roadmap to be completed in Fall, 2007
    - NAC and NRC review

Early Mission Workshops

- Decadal Survey presents ***synthesized*** missions
  - Thematic panels developed 35 missions from 101 RFI inputs
  - Executive committee developed 17 missions from 35 panel inputs

- What science can the synthesized Decadal Survey missions support?
  - Document impact of the compromises made during the syntheses
  - Importance of defining science "up front" so requirements do not grow and jeopardize the integrated road map

- What other measurements are necessary to achieve the science for each Decadal Survey mission?
  - Integrated roadmap must include all necessary measurements
  - NPOESS climate sensor demanifestation
  - Multi-mission "constellation" requirements (simultaneity and synergy)

- HQ organization
- Community involvement
- One workshop for ***each*** of the 4 highest priority NASA missions

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GUIDANCE, APPROACH, CONSTRAINTS (cont.)

- **Budget Constraints**
  - FY'07 Continuing Resolution
    - Minor overall decrease
    - Several Op. Plan changes to accommodate overruns, opportunities
  - FY08 Budget Request funds NASA precursor missions identified in Decadal Survey, 4 other NASA science missions, and one mid-sized ESSP mission
    - Global Precipitation Measurement mission (6/13, 6/14)
    - Landsat Data Continuity Mission (7/11)
    - NPOESS Preparatory Program (9/09 – 3/10)
    - OSTM (6/08), OCO (12/08), Glory (12/08), Aquarius (7/09)
    - ESSP solicitation possible late FY08, launch ~2014
    - First funding for dedicated Decadal Survey Mission is in 2012 ($30M)
  - **Comments**
    - Decadal Survey came out too late to influence the FY08 budget
      - » The FY08 NASA budget request **does** respond to the recommendations of the Decadal Survey Interim Report
    - FY09 NASA budget will be informed by the Decadal Survey
      - » Developing a formal, NASA/SMD initiative/augmentation request process

CHALLENGES

- **Overarching Principles**
  - Construct the best science program with available resources, each year
    - Objective is to advance Earth System science tangibly, through results
  - Preserve and expand the scientific consensus articulated in the Decadal Survey
  - Revitalize the Earth Science Flight Portfolio while maintaining a semblance of overall program balance
  - Programs in development
    - Manage $$ ***and*** performance
      - » While VIIRS performance will equal AVHRR/OLS, fixes to date do not appear to eliminate degradation to ocean color and aerosol products
  - Interagency interactions
    - OMPS-Limb is an encouraging sign
    - Decadal Survey does not provide specific guidance for sustained acquisition of new measurements beyond first NASA flights
  - Community effectiveness
    - Sustained emphasis on the importance of the Earth Science measurements
    - Resources
  - Focus vs. Balance