Earth Science

Overview of the President’s FY 2014 Budget Request
The LDCM Observatory was lifted to orbit by a United Launch Alliance Atlas V rocket launching from Vandenberg Air Force Base, Calif. The launch capped a flawless countdown.

The Observatory separated from the Centaur upper stage approximately 79 minutes after launch.
Sioux Falls – 30 March 2013

LDCM / Landsat 7
Earth Science Budget – FY14 Request

FY10 request
FY11 request
FY09 request
(previous Admin)

FY12 request
FY13 request
Appropriation
FY14 request
FY10 request
FY09 request
(previous Admin)
Non-Flight Budgets: 2007-2013

- R & A
- Applied Sciences
- Technology
- Competed Science Teams

Non-Flight Fraction of ESD Budget

Non-Flight Funding

- $400,000,000
- $450,000,000
- $500,000,000
- $550,000,000
- $600,000,000
- $650,000,000
- $700,000,000
- $750,000,000
- $800,000,000
Earth Science Budget Request Summary

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<th>FY2012</th>
<th>FY2013</th>
<th>FY2014</th>
<th>FY2015</th>
<th>FY2016</th>
<th>FY2017</th>
<th>FY2018</th>
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FY 2015-FY 2018 estimates are notional

FY13 numbers are not shown, and not fully determined at this time
Earth Science Budget Features

- Initiates new Land Imaging project for development of a national sustained Land Imaging Satellite System (with USGS) ($30M in FY14, $445M FY14-18)
- Expands Venture-Class competitive flight program ($50M in FY14)
- Initiates development of a program for TSIS, OMPS-Limb, and “CERES” measurements starting in the JPSS-2 time frame – ex-NOAA climate sensors ($40M in FY14, Dec Surv line)
- Completes integration of DSCOVR Earth observing instruments (EPIC and NISTAR) and initiates ground data system development in preparation for 2014 launch ($9.9M in FY14, $1.7M each in FY15,16)
- Ops funding for QSCAT, Jason-1, CloudSat, GRACE, SORCE in FY14 – ends all by FY18

- Advances development of SMAP, SAGE III/ISS, GRACE-FO, SWOT, CYGNSS, OCO-3, TEMPO, and ICESat-2 for launch before 2021
- Pre-formulation studies will continue for PACE, L-band SAR, and other Decadal survey-recommended and climate architecture missions
- Funds Carbon Monitoring System at $10M/year
- E/PO funding removed – GLOBE “protected”
- Space Geodesy acceleration for station final development/test
Bi-annual Senior Review
Ongoing in 2013
VENTURE-CLASS UPDATE/STATUS

• EV-1 (“EV-S” - Suborbital, Airborne)
  – All 5 investigations have completed at least 1 sustained field campaign
  – All EV-1 investigations will fly during 2013
  – Second EV-S solicitation funded, in preparation for release on schedule in mid-2013

• EV-2 (“EV-M” - Small-sat)
  – CYGNSS PI team and NASA program office making good progress, under contract 7 Dec 2012 (planned 2016-2017 launch)
  – ESD/SMD developing detailed “Class D” management approaches and processes

• EV-I (Instrument)
  – TEMPO selected for GEO hosted payload opportunity (2017 launch)
  – ESD initiating formal host selection/negotiation process
  – Second “EV-I/2” solicitation funded, on schedule for release
International Space Station

Earth Science Instruments

ESD/SAGE III (2014)
ESD/OCO-3 (2017)
ISS/CATS (2014)
ISS/HICO (2009)
ISS/RapidSCAT (2014)
ISERV (2012)

External Logistics Carriers – ELC-1, ELC-2, ELC-3
External Stowage Platforms – ESP-3
Alpha Magnetic Spectrometer
Columbus External Payload Facility
Kibo External Payload Facility
ESD/OCO-3 (2017)
ISS/CATS (2014)
ISS/HICO (2009)
Earth Observations from the ISS: NASA/ESD Status and Plans

• On-orbit instruments funded by non-ESD sources, ESD funding for analysis
  – HICO (Hyperspectral Imager for the Coastal Ocean)
    o Launched September, 2009 on HTV; mounted on JEM-EF
  – ISERV (Digital Camera and Telescope)
    o Launched July, 2012 on HTV-3; mounted internally on WORF

• Planned instruments funded by NASA/HEOMD, ESD funding for analysis
  – CATS (Cloud-Aerosol Transport System for ISS)
    o LIDAR, summer 2013, HTV, JEM-EF
  – Rapid-Scat (Ku-band scatterometer)
    o Launch early CY2014, Falcon/Dragon
  – Lightning Imaging Sensor (under consideration)
  – Hyperspectral Follow-on to HICO (under consideration)

• Approved instruments funded by ESD
  – SAGE-III (Stratospheric Aerosol and Gas Expt)
    – In Phase-C; 12/2014 Launch on Falcon/Dragon; ESA provides hexapod pointing p’form
  – OCO-3 (Orbiting Carbon Observatory-3 instrument only)
    – Phase-A November 2012; Launch Fall, 2017
Reinvigorate On-Orbit Constellation (1 of 2)

- OSTM/Jason-2  Launched 6/2008
- OCO  Launched 2/2009 (LV Failure)
- Glory  Launched 3/2011 (LV Failure)
- Aquarius/SAC-D  Launched 6/2011
- NPP  Launched 11/2011
- LDCM  Launched 2/2013
- GPM  On Schedule for 2/15/2014 Launch
- OCO-2  On Schedule for 7/1-7/2014 Launch
- SMAP  On Schedule for 10/31/2014 Launch
- SAGE-III/ISS  On Schedule for 12/2014 Launch
Reinvigorate On-Orbit Constellation (2 of 2)

- GRACE-FO: Formulation for launch 8/2016
- ICESAT-2: Confirmed for launch 12/2016
- CYGNSS (EVM): Formulation for launch late 2016/17
- OCO-3/ISS: Formulation for launch 2017
- TEMPO (EVI): Formulation for launch 2017
- PACE: Acquisition Strategy under evaluation, launch 2020
- SWOT: Formulation for launch 2020