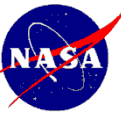


Understanding MSFC/Earth Science Office Within NASA

Doug Rickman
NASA/MSFC
Huntsville, Alabama



At the Agency Level

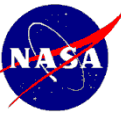


- **Direction is given to the Agency by Congress and the Administration**
- **Management responsibility and authority within NASA devolves through the Administrator, currently Charlie Bolden**
- **The NASA Advisory Council provides independent advise to the Administrator**
- **NASA is managed to a set of Strategic Goals**
- **Within the Science Directorate plans to achieve the Strategic Goals are strongly affected by advise obtained from the National Research Council.**
- **NRC work is done by 6,000 of the world's top scientists and engineers who volunteer their time without compensation.**
- **Therefore, the scientific community has a major voice in what research NASA does.**

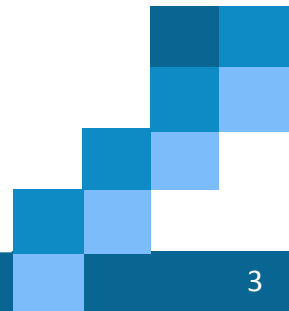




Strategic Goals for Earth Science

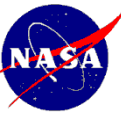


- **Strategic Goal 3: Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration.**
- **Sub-goal 3A: Study Earth from space to advance scientific understanding and meet societal needs.**
- **Understanding the Earth as an integrated system is a major emphasis within NASA.**
- **Global climate is a substantial part of this systems oriented view.**

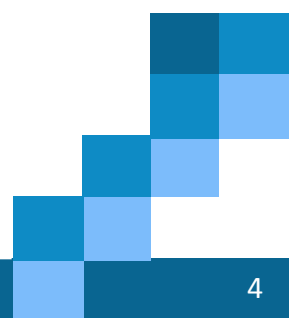


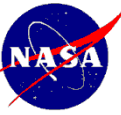


Policy Considerations

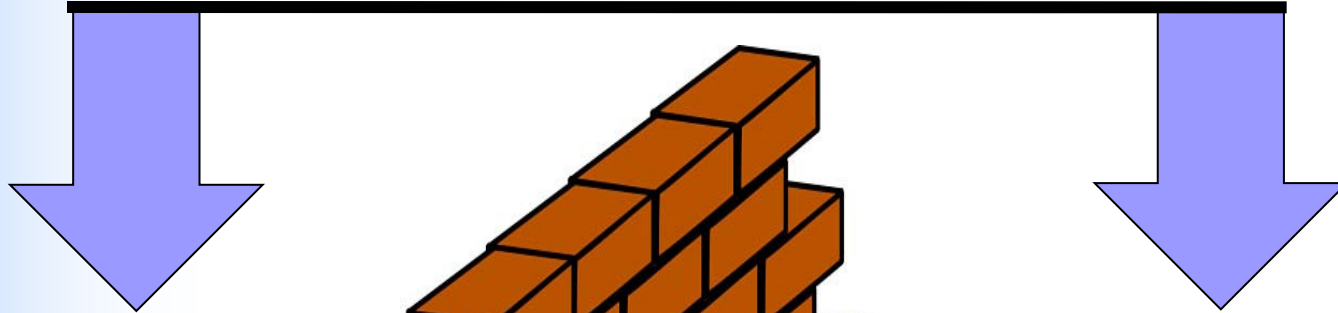


- **Programs to achieve the Strategic Goals are controlled out of Headquarters.**
- **Management of the workers and the facilities is NOT controlled out of Headquarters.**
- **The Agency is a civil agency focused science, data and results are open to the public.**
- **The Agency authority to engage outside of the United States is defined and executed out of NASA Headquarters.**
 - Such functions are reserved dominantly to the Department of State.
 - NASA does have over 400 Memoranda of Understanding or comparable relationships with foreign entities.
- International activities

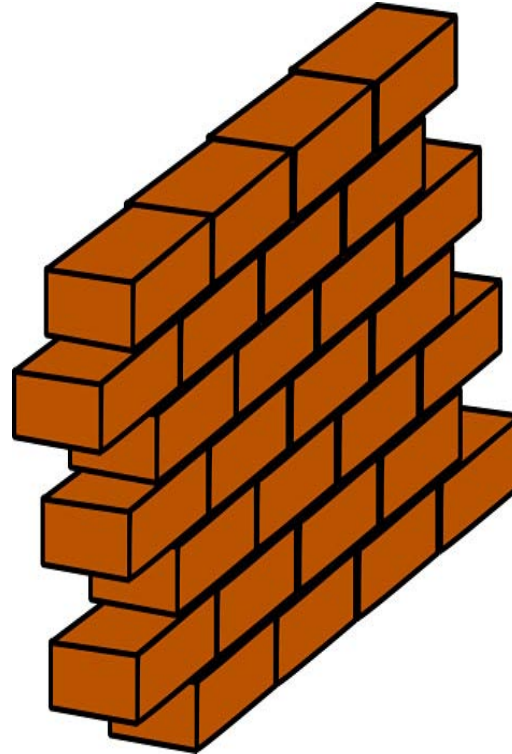




NASA Administrator



Direction of Programs



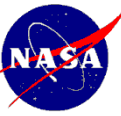
Management of 20,000 Employees and 10 Field Centers

In High Risk Endeavors Segregation of Responsibilities Can Increase Safety





NASA Programmatic Budget

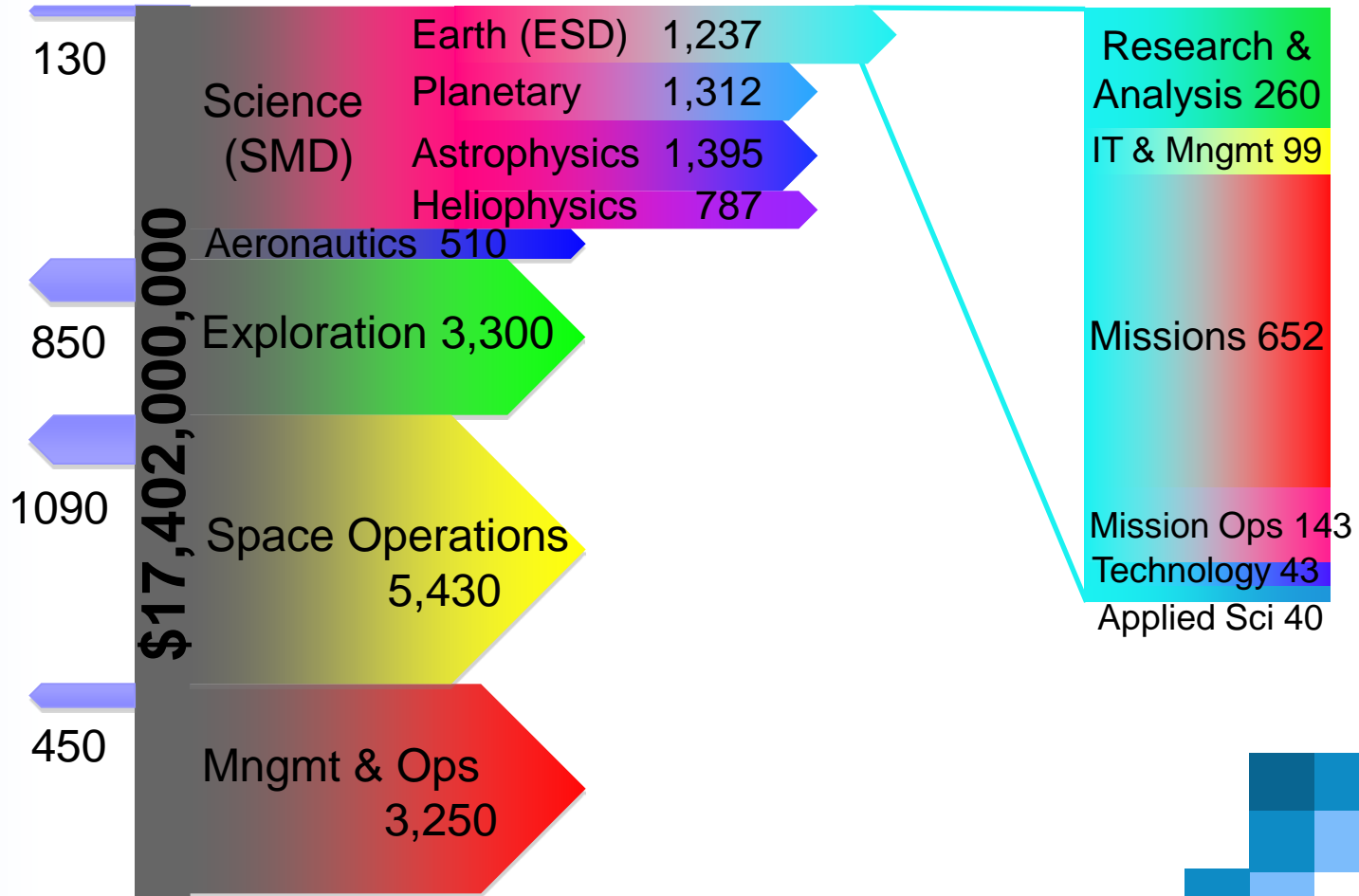


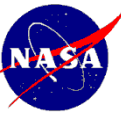
MSFC

2nd largest NASA Center by budget

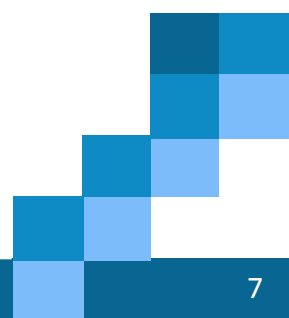
2500 NASA C.S. + contractors

Part of 35,000 employees on Redstone



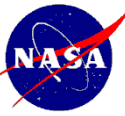


- **MSFC is a major science Center for the Agency, after Goddard and JPL.**
- **MSFC has leadership in several fields of astrophysics, optics, climatology, meteorology and applications of remote sensing.**
- **The MSFC Earth Science Office manages work in pertaining to the Headquarters Earth Science Division.**
- **There are currently approximately 40 active research and development topics within the Earth Science Office**

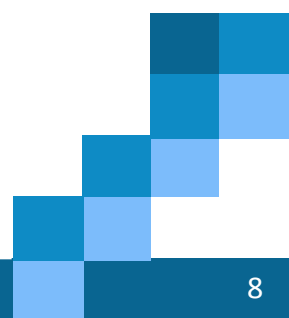




The Earth Science Office (ESO)

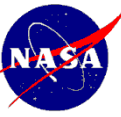


- **The number of civil servant scientists in the Earth Science Office is relatively small, but is highly leveraged using long term partnerships with academic and other institutions: for example USRA, UAH, UAB, NWS, CDC, NOAA.**
- **Our staff is predominately funded through competitive, peer review awards.**
- **NASA Earth Science Division is the largest source of funds for the MSFC/Earth Science Office.**
- **International activity has become an important fraction of our work. Through SERVIR we currently work with nations in Central America, Africa and with Nepal. In addition to Turkey, we have recently worked with such nations as Mexico, Canada, and Suriname.**

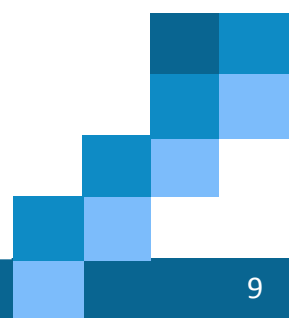


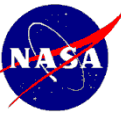


Within the ESO – I: Satellite & Airborne Sensors

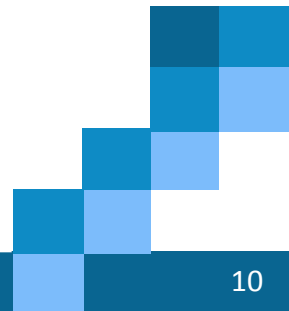


- **Instrument Development – Currently 2 airborne, passive microwave instruments are in aggressive development. Both have recently successfully been deployed for the first time.**
- **Existing Instruments**
 - **Lightening Imaging Sensor, currently on the TRMM satellite**
 - **AMPR – an airborne passive microwave system for measuring hurricane winds and rain**
- **Previous Instruments**
 - **OTD – earlier satellite lightening detector**
 - **TIMS, CAMS, ATLAS – airborne visible – thermal imaging scanners**
- **Related work - Real Time Mission Monitor**



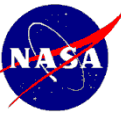


- **Public Health**
 - **Earth Science Office leads many projects in this area.**
 - **Many projects with many collaborators**
 - **Beginning work with international collaborators**
- **Air Quality**
- **Aviation Weather**
- **Agriculture**
- **Water Resources**
- **SERVIR**

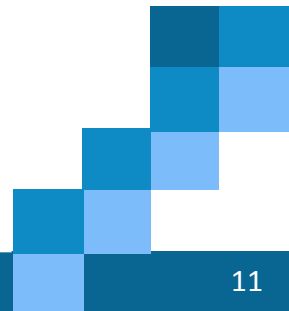




Within the ESO – III: Some Major Topics

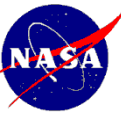


- **Weather modeling, especially using satellite data**
- **Processing of satellite data for meteorological purposes**
- **Lightning – mapping, impact on atmospheric chemistry**
- **Soil moisture – remote measurement, modeling, use**
- **Hurricanes and other severe weather**
- **Energy budget within the atmosphere**
- **Radiative energy processes at the land surface**

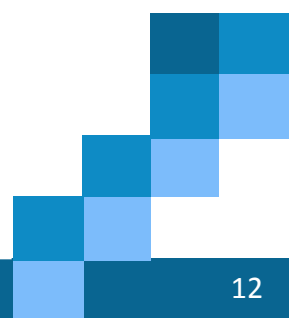




Within the ESO – IV: Other Topics

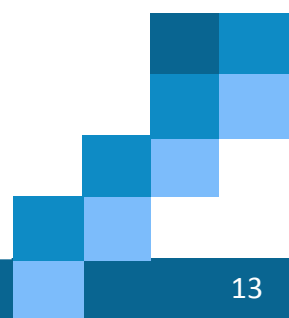
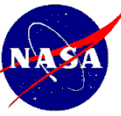


- **Atmospheric chemistry and transport**
- **Coastal processes and modeling**
- **Urban modeling**
- **Lunar regolith and simulants**



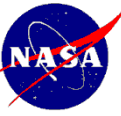


Backup Slides

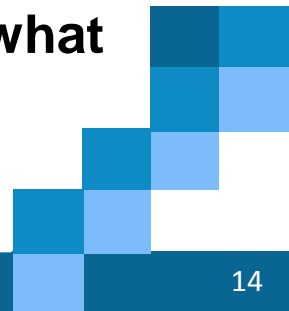




The National Research Council

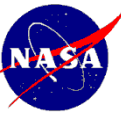


- **The National Research Council (NRC) functions under the auspices of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The original congressional charter was signed by President Abraham Lincoln in 1863.**
- **One of the NRC's missions is to improve government decision making and public policy.**
- **The NRC is committed to providing elected leaders, policy makers, and the public with expert advice based on sound scientific evidence. The work is made possible by 6,000 of the world's top scientists, engineers, and other professionals who volunteer their time without compensation.**
- **Therefore, the scientific community has a major voice in what research NASA does.**





NASA Personnel and Facilities



Johnson Space Center

Marshall Space Flight Center (MSFC)

Kennedy Space Center

Goddard Space Flight Center

Ames Research Center

Glenn Research Center

Dryden Flight Research Center

Langley Research Center

Stennis Space Center



NASA Headquarters Jet Propulsion Laboratory

Wallops Flight Facility