National Aeronautics and Space Administration

Tracking Earth's Diminishing Resoures

Manatee Observation and Education Center – Eco Evenings

Billy Stover
Deputy Chief Safety Officer
Kennedy Space Center

March 19, 2020

Exploring Earth

- For more than six decades, NASA has used the vantage point of space to understand and explore our home planet, improve lives and safeguard our future.

- NASA brings together technology, science, and unique global Earth observations to provide societal benefits and strengthen our nation.

- NASA's observations of Earth's complex natural environment are critical to understanding how our planet's natural resources and climate are changing now and could change in the future.

Exploring Earth (cont'd)

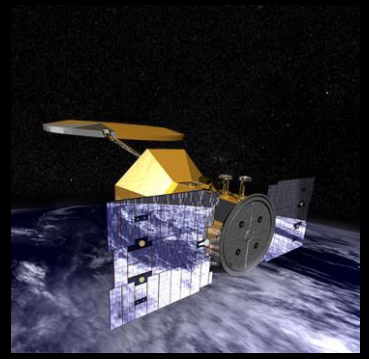
- Earth observations and information made possible by NASA form the foundation for critical environmental planning and decisions by people all over the world.

- NASA makes its Earth observations freely and openly available to those seeking solutions to important global issues such as changing freshwater availability, food security and human health.

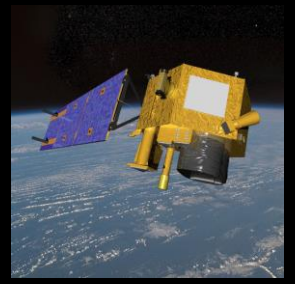
- Advancing knowledge of our home planet contributes directly to America's leadership in space and scientific exploration.

History of Earth Focused Missions

- Earth Missions Historical Timeline



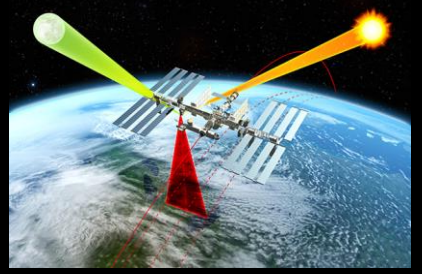
Aquarius



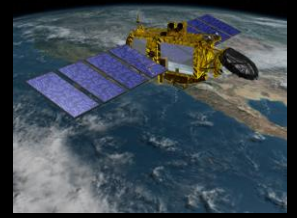
EO-1

Aqua

TIROS



CLARREO

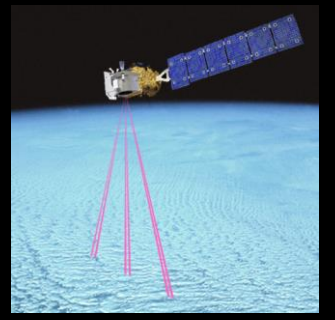


Jason 3

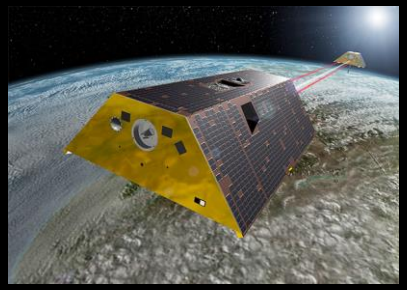
GOES A-C

Landsat-7

ECOSTRESS



ICESat-2



GRACE FO

Aqua

Aqua

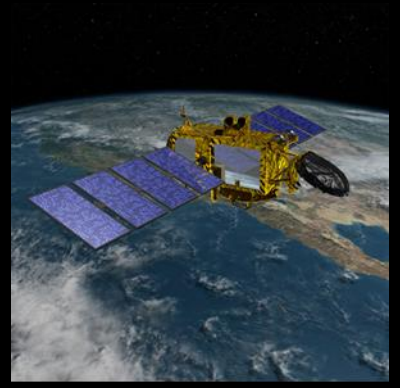
- Purpose –
  - International Earth Science Satellite named for the large amount of data being obtained about water in the Earth System
- Science Focus Areas –
  - Atmospheric Composition
  - Carbon Cycle, Ecosystems and Biogeochemistry
  - Climate Variability and Change
  - Water and Energy Cycles
  - Weather
- Science Goals –
  - Enhanced understanding of water in the Earth's climate systems and global water cycle
  - Enhanced understanding of additional components of the Earth's climate system and their interactions
  - Improved weather forcasting

Landsat-7

Landsat-7

- Purpose –
  - Continuing part of NASA's long term coordinated research effort to study the Earth as a global environmental system
- Science Focus Areas –
  - Carbon Cycle, Ecosystems, and Biogeochemistry
  - Earth Surface and Interior
- Science Goals –
  - Acquire sunlit, essentially cloud-free global seasonal coverage of Earth's land masses
  - Provide well-calibrated radiometric and geometric data
  - Meet requirements for global-change research by providing imagery that are consistent with the acquisition geometry, spatial resolution, spectral characteristics, and calibration of previous Landsat data

Jason-3



Jason 3

- Purpose –
  - International Earth Science Satellite that measures the height of the oceans' surface
- Science Focus Areas –
  - Climate Variability and Change
  - Water and Energy Cycles
- Science Goals –
  - Continue to me the following science goals of the ocean surface topography effort
  - Determine general ocean circulation and understand its role in Earth's climate, particularly how ocean circulation impacts Earth's hydrological and biogeochemical cycles
  - Study the variation of ocean circulation on time scales ranging from seasonal and annual to decadal and examine how this variation impacts climate change
  - Collaborate with other global ocean monitoring program to produce routine models of the global ocean for scientific and operational applications

NASA Earth Science Division Operating Missions

Leadership in Space Exploration

- Develop
- Mission –
  - Integrating NASA Earth observations with society to foster future innovation and cultivate the professionals of tomorrow by addressing diverse environmental issues today
- Vision –
  - Shaping the future by integrating Earth observations into global "decision making".
- Core Values –
  - Collaboration, Discovery, Service, Passion

Exploration Summary

- NASA and our partners (International and commercial) are using space to gather essential data to help manage and preserve Earth's resources

- This data is made available freely and openly to help those seeking solutions to important global issues such as changing freshwater availability, food security and human health.

- Advancing knowledge of our home planet contributes directly to America's leadership in space and scientific exploration.

National Aeronautics and Space Administration