



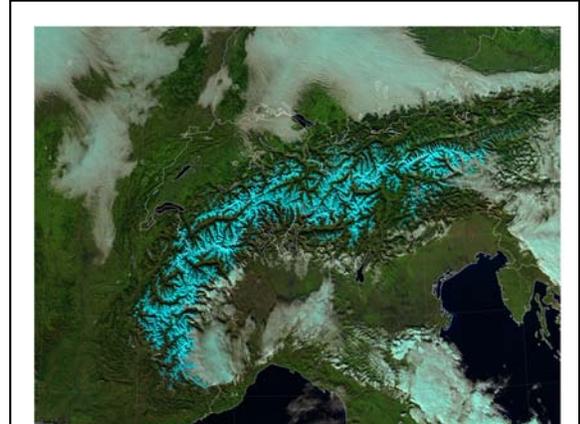
The **Center for Satellite Applications and Research (STAR)** is the science arm of the National Environmental Satellite, Data, and Information Service (**NESDIS**), which acquires and manages the nation's environmental satellites for the National Oceanic and Atmospheric Administration (**NOAA**). STAR research activities, integral to the implementation of NOAA's research priorities, are aligned with and carried out in direct support of NOAA and NESDIS programs, strategic goals, and performance objectives.

### STAR's Mission

*To accelerate the transfer of satellite observations of the land, atmosphere, ocean, and climate from scientific research and development into routine operations, and offer state-of-the-art data, products, and services to decision-makers.*

### STAR's Vision:

*To advance remote sensing science and technology to better inform the American public and safeguard the environment.*



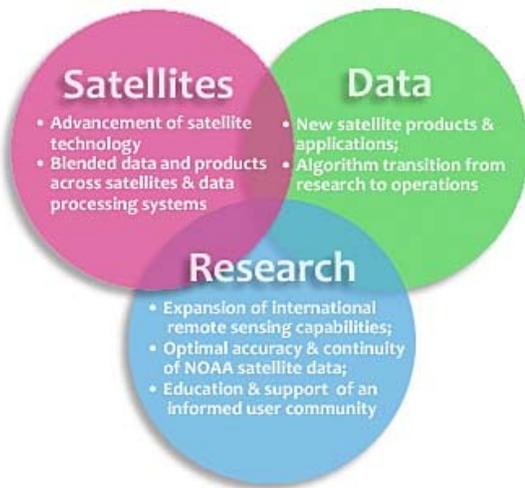
**STAR Data Product Example:**

**VIIRS "natural color" composite of channels I-01, I-02 and I-03, taken 12:29 UTC 14 November 2012**

The United States invests billions of dollars in environmental satellites annually in order to monitor the Earth's environment, including:

- **Assessing current conditions;**
- **Predicting future changes on the earth; and**
- **Understanding long-term changes in the environment.**

STAR supports these activities by advancing satellite technology, producing data products, and performing research / outreach.



**Satellite, Data, and Research Efforts at STAR: Interrelated Work**

STAR supports four phases of the life cycle of satellite hardware, data, and products:

- The life cycle begins with the **Creating** stage of products and systems. STAR helps identify new requirements for satellite data and environmental information; the Center addresses the important science questions that need to be answered in order to meet those requirements. STAR scientists then conduct the research in support of new sensor technology, products, and applications to meet these requirements.
- During the **Producing** phase, STAR develops and tests products that meet the customer's requirements. After an extensive evaluation, the products that satisfy the requirements are transferred to operations for customer use. Once a product is operational, customer feedback guides the selection of products for improving or enhancing existing capabilities.
- The next phase - **Enhancing** - consists primarily of two techniques to improve current products:
  - Refining the formulas used to produce operational products
  - Combining data from other sensors to improve the products
- In the **Mastering** phase, quality and excellence are instilled into the routine methods used to process data.

## Life Cycle of Satellite Hardware, Data, and Products

| Creating  |   | Producing  |   | Enhancing  |   | Mastering   |  |
|---|---|--|---|--|---|---|--|
| Sensor Research   | Product Research  | Technology Transfer  | Product Development                             | Algorithm Refinement   | Technology Infusion   | Calibration                                       | Validation   |
| <i>Research new sensor applications; analyze potential impact</i> | <i>Research new products to meet ever-changing needs of users</i> | <i>Transfer software to operations and science community</i> | <i>Develop solutions to users' requirements</i> | <i>Advance state of the science; improve product quality</i> | <i>Use new satellites, sensors and computing capabilities</i> | <i>Inter-compare satellites / reference sites</i> | <i>Monitor product quality; verify satellite sensors</i> |

Throughout all four phases, STAR shares its findings with partners and stakeholders to promote creative thinking about methods that would use satellite data to obtain better information about the Earth and its environment.

STAR scientists lead efforts to develop, test, validate, and refine the science algorithms needed to drive user-defined products. STAR also investigates both enhanced and new sensor technology for future NOAA satellite missions. STAR research examines which products users will need- including ocean, ecosystem, climate, and weather products-to carry out NOAA's mission goals. STAR supports the calibration and validation of all data in NOAA's satellite operations. In addition to maintaining existing calibration sites, STAR develops new methods for intercalibrating data from NOAA polar and geostationary satellites with other satellites in the evolving international system. In addition, STAR collaboratively develops efficient methods and technology to transfer new products from research to operations.