

# NASA's EOSDIS, Trust and Certification



**H. K. "Rama" Ramapriyan**  
**Science Systems and Applications, Inc. and NASA GSFC ESDIS Project**  
**Presented at ESIP Summer Meeting, 27 July 2017**

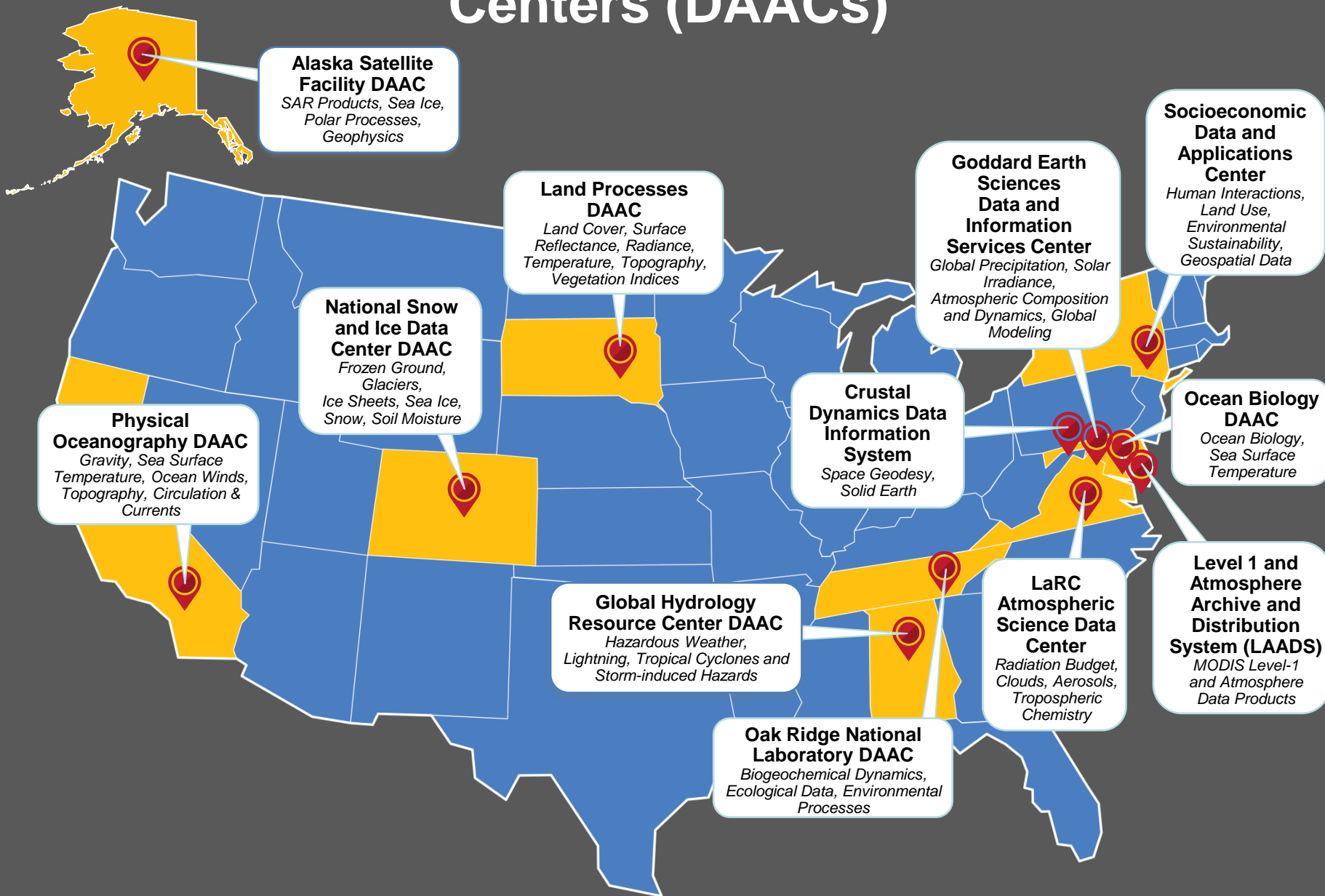


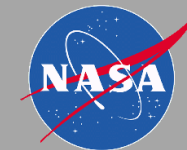
# Earth Observing System Data and Information System (EOSDIS)



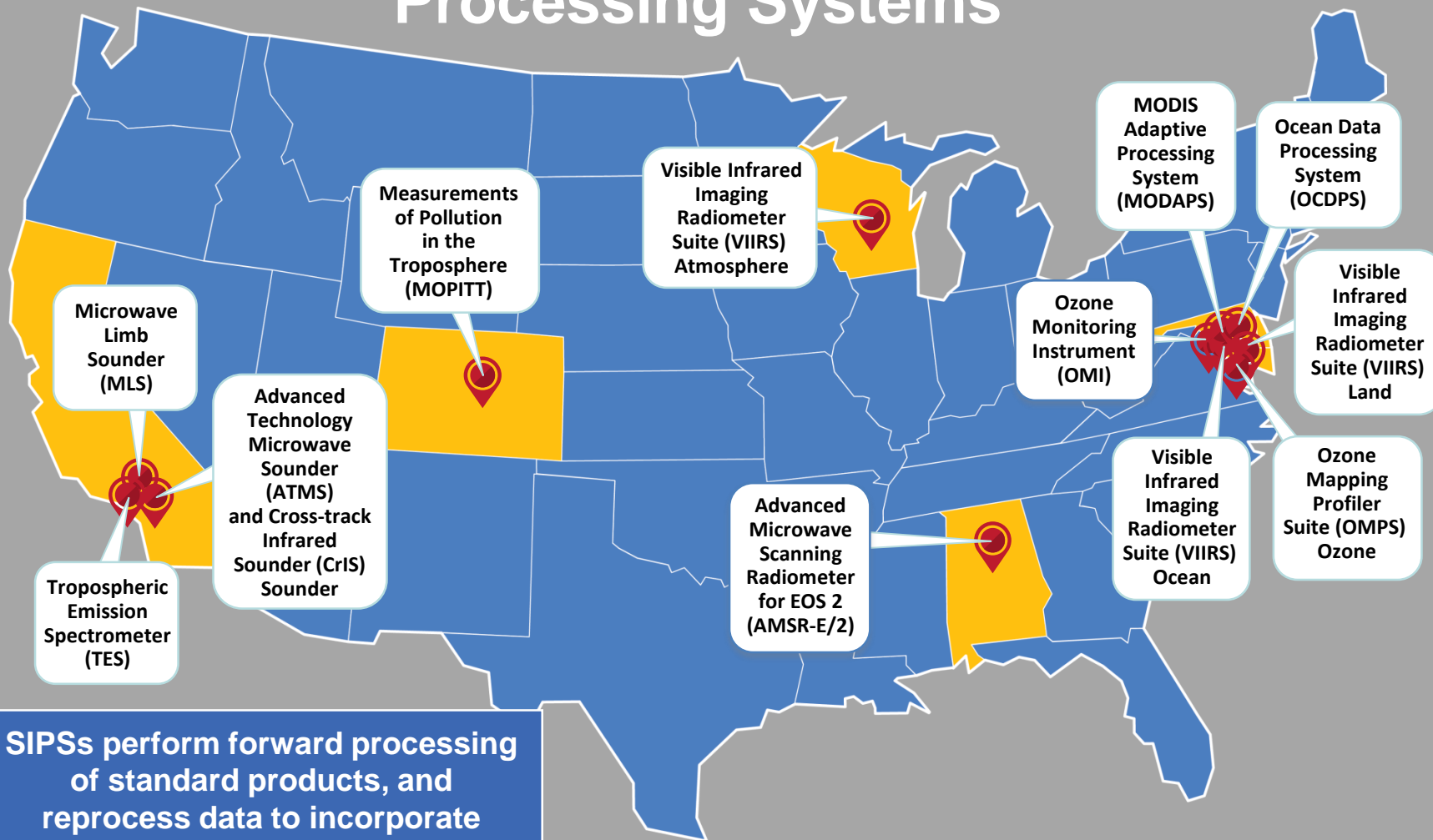
- **Operating since August 1994**
- **Designated by Federal Government**
  - **legally bound by Circular A-130 (Managing Federal Information as a Strategic Resource) and the Federal Records Act**
  - **Must follow NIST and NARA regulations**
  - **NASA Procedural Requirements (NPR 7120.5) govern details of Program/Project Management**
- **Provides end-to-end capabilities for managing NASA's Earth science data.**
  - **Science Operations**
    - ❖ **Science data processing**
    - ❖ **Data management**
    - ❖ **Interoperable distributed data archives**
    - ❖ **On-line data access services**
    - ❖ **Earth science discipline-oriented user services**
  - **Network Data Transport to distributed system elements**

# Distributed Active Archive Centers (DAACs)





# Science Investigator-led Processing Systems



SIPs perform forward processing of standard products, and reprocess data to incorporate algorithm improvements.

# Session Questions and “Quick” answers



- What certification process did you use for your use case?
  - ICSU/World Data System (most recently)
- Why was this certification process selected?
  - Recommendation in 2012 by Bernard Minster (Member, Earth Science Subcommittee of NASA Advisory Committee) and request by Martha Maiden (NASA HQ Program Executive for Earth Science Data Systems)
- What were the pros and cons as a result of using the identified certification process?
  - Pros
    - Provides opportunity for self-examination
    - Relatively easy process given the rigor with which the system and its data centers have been developed and managed
  - Cons
    - One more review and certification in addition to regular internal and external reviews

# Session Questions and “Quick” answers



- Where were the key outcomes?
  - ESDIS Project is a Network Member of WDS
  - 10 of 12 DAACs are Regular Members of WDS
  - Potentially broader visibility (difficult to measure – no specific metrics to assess incremental change that resulted by the certification)
  - Participation in ICSU/WDS/CODATA sponsored meetings (SciDataCon; WDS Forum)
- What are the next steps?
  - WDS and Data Seal of Approval (DSA) certification have merged
  - Recertification every 3 years

# A Little History (1 of 5)



- **EOSDIS Advisory Panel (early to mid-1990's)**
  - adhere to a flexible, distributed, portable, evolutionary design;
  - distribute data products by appropriate high-bandwidth communication or other media;
  - operate prototypes in a changing experimental environment
- ◆ **NASA response:**
  - Distributed architecture with DAACs
  - Version 0 working prototype
- **DAAC User Working Groups (on-going)**
  - Science discipline community input to DAAC performance
- ◆ **NASA response:**
  - Implemented process for adding community-developed tools, services and datasets to the DAACs

# A Little History (2 of 5)



## ■ NRC Review (1995)

- “Responsibility for product generation and publication and for user services should be transferred to a federation of partners selected through a competitive process open to all”

- <http://www.gcrio.org/USGCRP/LaJolla/appF.html>

### ◆ NASA response:

→ Working Prototype Earth Science Information Partners (ESIP) Federation

## ■ EOSDIS Review Group (1997)

- Recommended “an adaptive approach which will be less centralized, giving more responsibility to the PIs”

### ◆ NASA response:

→ PI-led Science Investigator-led Processing System (SIPSs)

## ■ NRC Review of DAACs (site visits 1997-1998)

- Committee on Geophysical and Environmental Data, National Research Council – Report ISBN: 0-309-52102-5 (1999)
- Detailed recertification activity



# A Little History (3 of 5)



## ■ New Data and Information Systems and Services (NewDISS) Strategy Team (1998 - 2002)

- Report:

- [https://earthdata.nasa.gov/sites/default/files/field/document/ND\\_Reprt\\_0.pdf](https://earthdata.nasa.gov/sites/default/files/field/document/ND_Reprt_0.pdf)

- Six recommendations

- Clearly define components
  - Employ Infrastructure providing NASA-private sector liaisons
  - Employ competitive processes to select components
  - Empower science investigators for data system development, processing archiving and distribution
  - Apply lessons learned from WP-ESIP Federation
  - Charter transition team

- ◆ NASA response:

- Core and Community Data Systems (Core: EOSDIS with DAACs; Community: REASoN projects → ACCESS & MEaSURES)

- ESIP Federation

- Earth Science Data System Working Groups (ESDSWG, 2004)

# A Little History (4 of 5)



- **Earth System Science and Applications Advisory Committee (ESSAAC) Subcommittee on Information Systems and Services (ESISS, 2003)**
  - ◆ **NASA response:**
    - Initiated annual American Consumer Satisfaction Index (ACSI) surveys through CFI, an independent organization
- **Evolution of EOSDIS Elements Study Team/ Technical Team (2005)**
  - **Developed “EOSDIS 2015 Vision”**
    - EEE Study Team (2005) Evolution of EOSDIS Elements, Study Team Briefing to NASA.  
<http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20090003203.pdf>
  - ◆ **NASA response:**
    - First step implementation during 2006-2008 – reallocated functions, simplified system, increased automation, improved services, reduced operations costs
    - Vision tenets continue to be used as a checklist to assess progress of on-going improvements

# A Little History (5 of 5)



- **Evolution of EOSDIS Elements Study Team/ Technical Team (2005)**
  - **Developed “EOSDIS 2015 Vision”**
    - **EEE Study Team (2005) Evolution of EOSDIS Elements, Study Team Briefing to NASA.**  
<http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/20090003203.pdf>
  - ◆ **NASA response:**
    - **Implementation during 2006-2008 – reallocated functions, simplified system, increased automation, improved services, reduced operations costs**
    - **Vision tenets continued to be used as a checklist to assess progress of on-going improvements**
- **NASA Technology and Capabilities Assessment Team (TCAT, 2014)**
  - **Evolution and Efficiency Team Recommendations**
    - **Consider advancing current efforts to achieve efficiencies across DAACs, including cloud computing, open source software , and dataset interoperability**
- **EOSDIS Review Team (2015)**









# Independent Survey of Customer Satisfaction



- **As a result of the 2003 Panel Review, ESDIS was requested to conduct an Independent Survey of DAAC performance and customer satisfaction.**
  - **Survey contract was awarded to the CFI Group that runs the American Customer Satisfaction Index.**
- **For 13 years, EOSDIS consistently exceeded the Federal Government average**
- **Ratings in the mid to upper 70s are considered “very good/world class” by the rating organization, the CFI Group**
- **2016 Survey results based on 7,133 responses**  
<https://earthdata.nasa.gov/about-eosdis/performance/american-customer-satisfaction-index-reports>
- **Comments in surveys help define DAAC system improvements**



# EOSDIS ACSI History

