

The Value of Being a Trustworthy Repository

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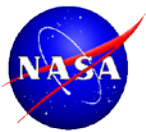


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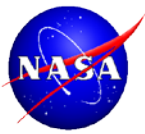
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The Value of Being Trustworthy



- NASA has invested in 60 years of data and information systems
 - But **trustworthiness in our repositories** is still a goal that we strive to achieve and even exceed
- Why?
 - Enables the success of any NASA science mission
 - Inspires general science research and applications
 - Justifies the cost of operations
 - Contributes to the value of the Open Data Policy
 - Influences the long term, historical view for the data collection
- ***But what is TRUST and how does it apply to EOSDIS?***

EOSDIS Comprises Data of the Whole Earth System



Atmosphere

Winds & Precipitation
Aerosols & Clouds
Temperature &
Humidity
Solar radiation

Ocean

Surface temperature
Surface wind fields &
Heat flux
Surface topography

Ocean color

Cryosphere

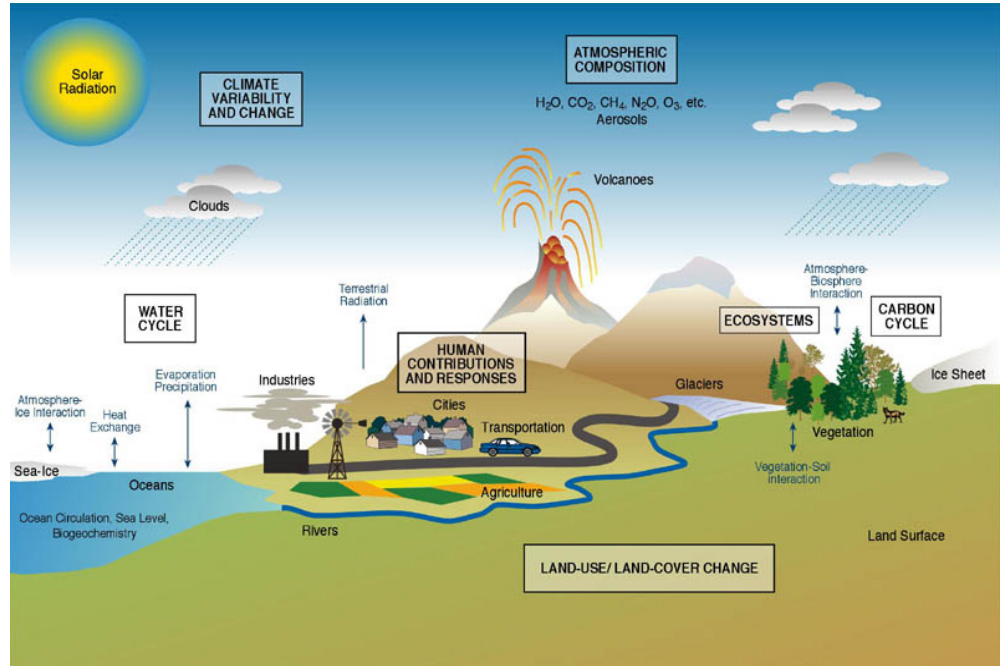
Sea/Land Ice
Snow Cover

Land

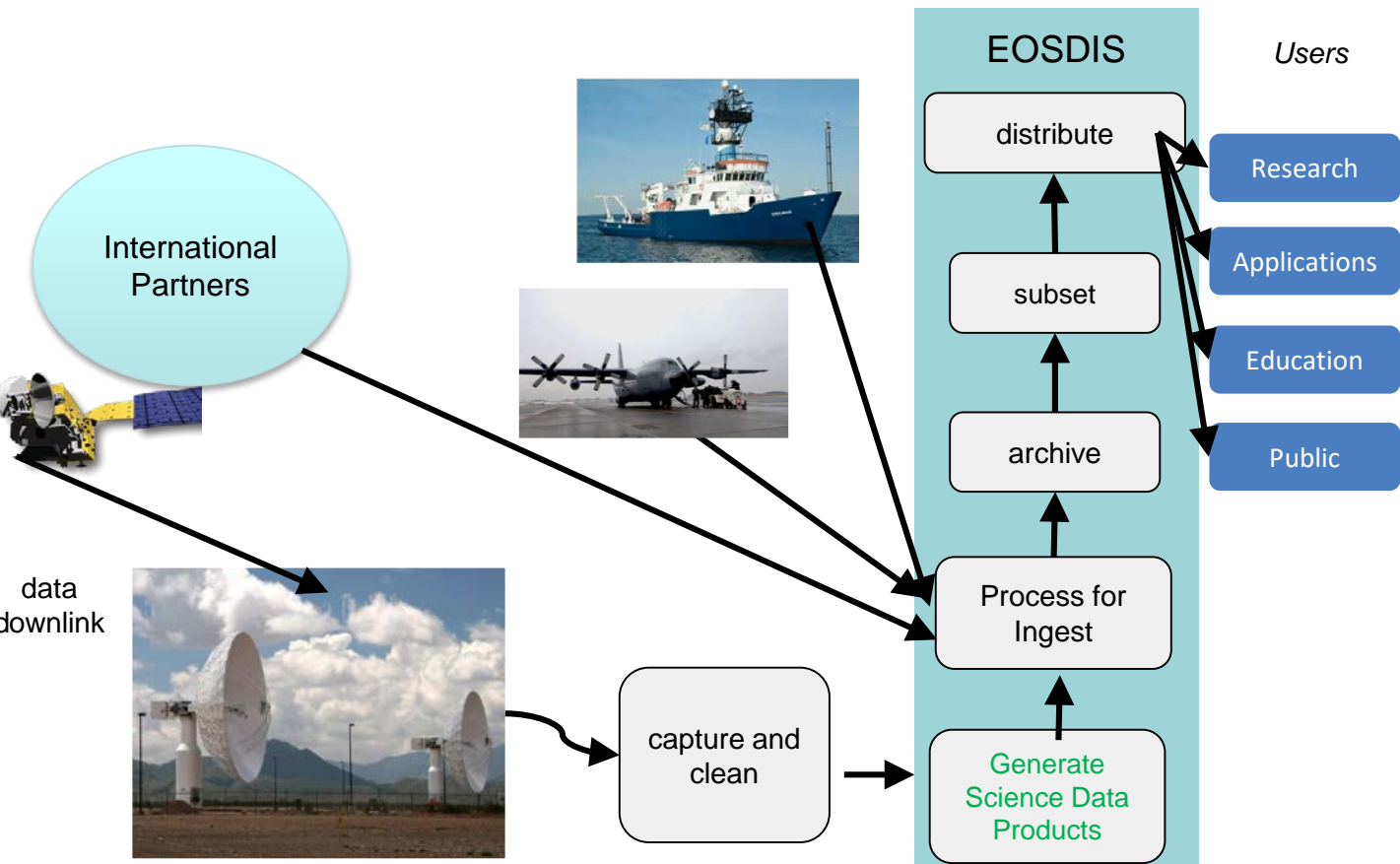
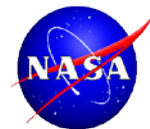
Cover & Usage
Soil Moisture
Topography & elevation
Temperature

Human Dimensions

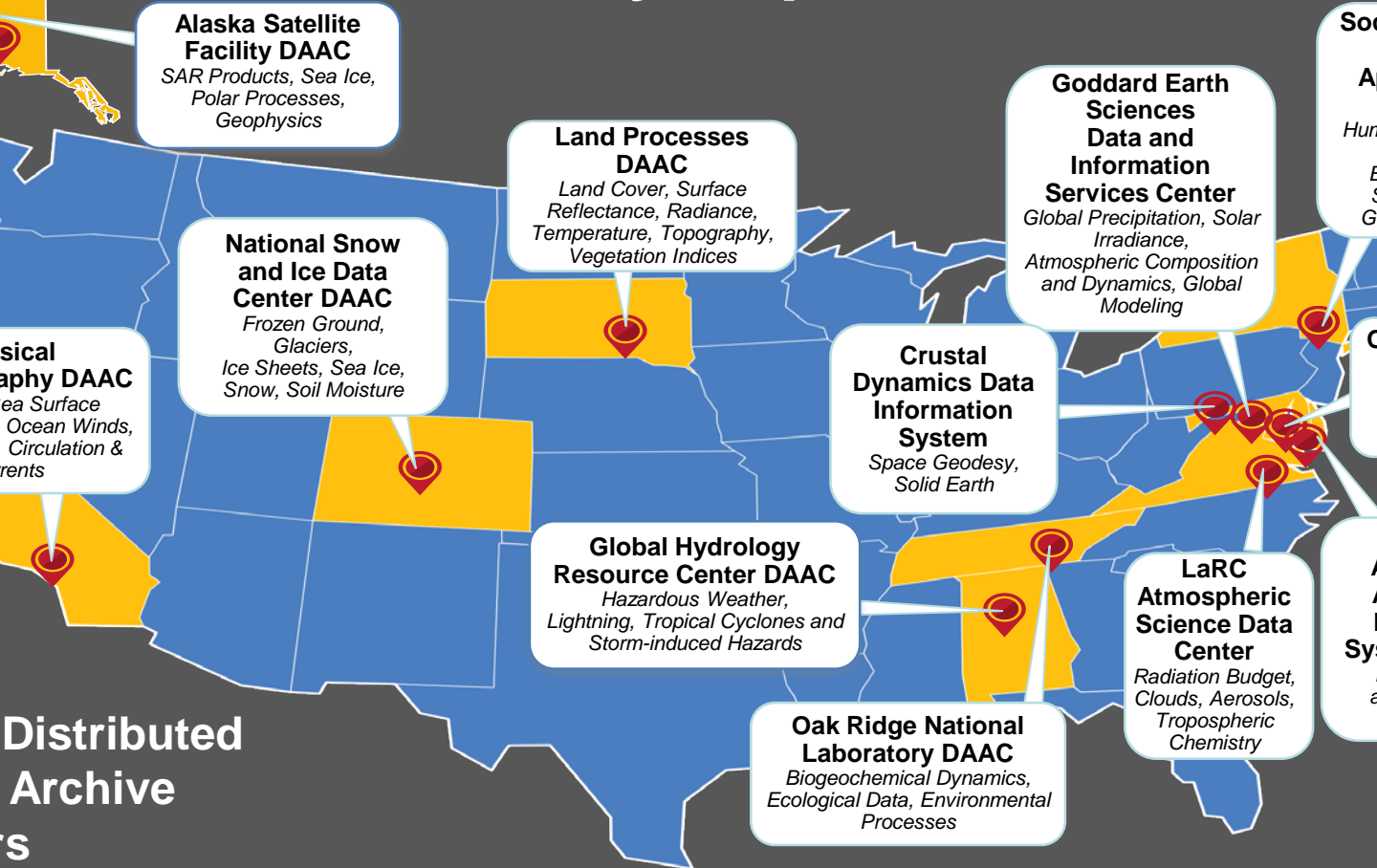
Population & Land Use
Human &
Environmental Health



Earth Observing System Data and Information System (EOSDIS)



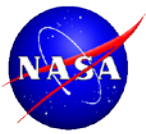
Trustworthy Repositories



Distributed
Archive

s

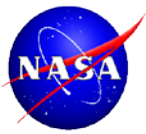
TRUST Principles*



- **T - Transparency** is achieved by providing publicly accessible evidence of the services that a repository does and does not offer.
- **R - Responsibility** is a commitment to provide reliable data services.
- **U - User community** is a commitment to implement and enforce the standards and norm of the user community.
- **S - Sustainability** is the capability to support long-term data preservation and use.
- **T - Technology** is the infrastructure and capabilities to support the repository operations.

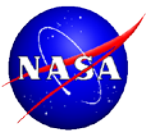
*From: Lin, Dawei, "The TRUST Principles for Trustworthy Data Repositories – An Update, RDA/WDS Repository Certification IG, September 12, 2019

T - Transparency



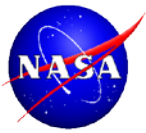
- **All information about policies, practices and capabilities are publicly available**
- **An extensive, comprehensive and easy-to-traverse website:**
<https://earthdata.nasa.gov/>
- **Policies (Open data, software and services)**
 - <https://earthdata.nasa.gov/collaborate/open-data-services-and-software>
- **Practices**
 - **Adding new data** - <https://earthdata.nasa.gov/collaborate/new-missions>
 - ❖ <https://earthdata.nasa.gov/collaborate/new-missions/adding-orbital-airborne>
 - ❖ <https://earthdata.nasa.gov/collaborate/new-missions/adding-competitive-other>
 - **Requirements, Standards & References** - <https://earthdata.nasa.gov/esdis/eso/standards-and-references>
- **Capabilities** - <https://earthdata.nasa.gov/eosdis>

R - Responsibility

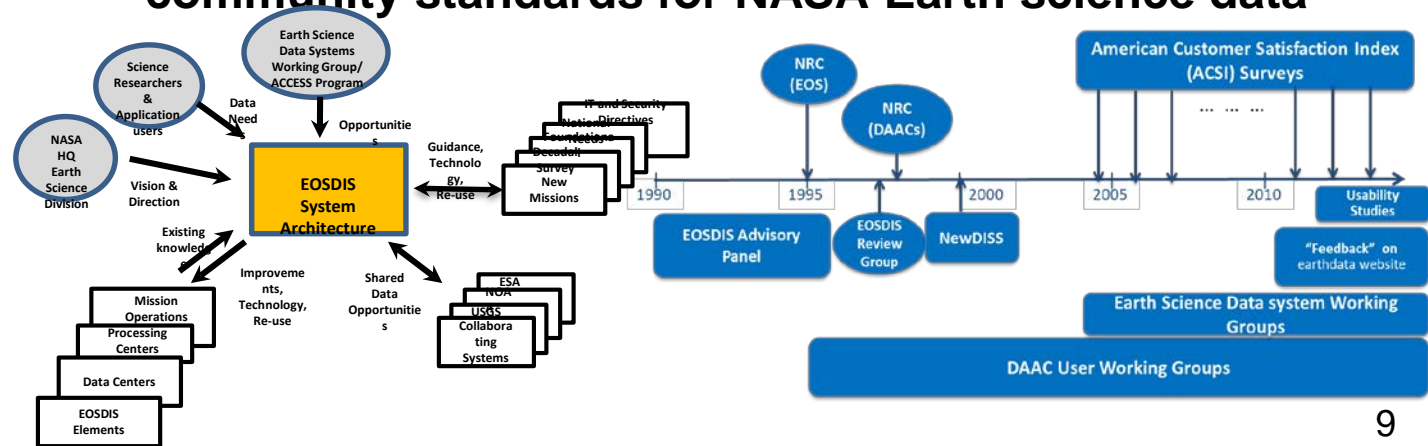


- **Commitment to provide reliable data services.**
 - **Proven record of supporting new missions and data**
 - **Data products accompanied by information about data quality**
 - **Sustained funding support for the data collection from NASA**
 - **Focused attention on discipline-specific user needs; Repositories are colocated with scientific expertise**
 - **Continuous review of data and metadata collection; migration to new technologies; implementation of new capabilities**
 - **Commitment to FAIR principles**

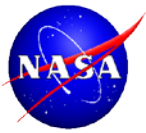
U - User community



- **Commitment to implement and enforce the standards and norm of the user community.**
- **Proven customer satisfaction as assessed through annual American Consumer Satisfaction Index (ACSI) surveys conducted by the CFI Group**
- **EOSDIS has 30 years of user community input into design/development**
- **ESDIS Standards Office reviews and approves community standards for NASA Earth science data**



S - Sustainability



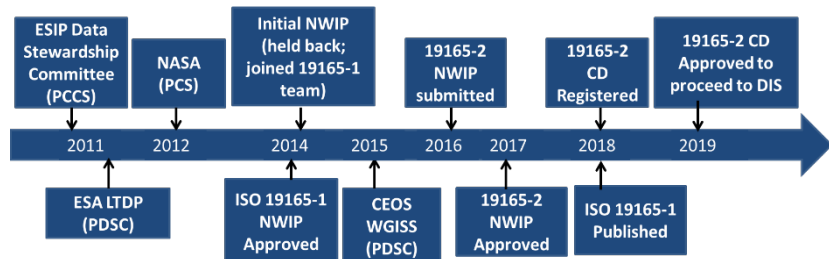
- **Capability to support long-term data preservation and use.**
- **Preservation Content Specification to ensure future understandability & reusability**
- **Leading ISO standard development**
- **CoreTrustSeal certification for NASA's EOSDIS repositories located at Centers of expertise**
- **Sustained long-term commitment and funding from NASA**



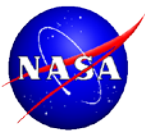
Earthdata
Cloud

1980s

2020s



T - Technology



- **Infrastructure and capabilities to support the repository operations.**

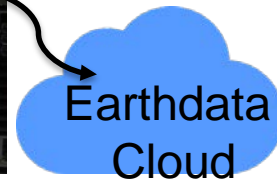
- **On-going evolution since the beginning to keep up with state-of-the-art and changes in users' expectations**
- **User needs' assessments, internal/external reviews, Earth Science Data System Working Groups' recommendations help identify capability needs**
- **Lessons learned and information technology advances coupled with advice/comments from community supports a continuously evolving data system with growing capabilities**



1980s

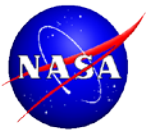


1990s

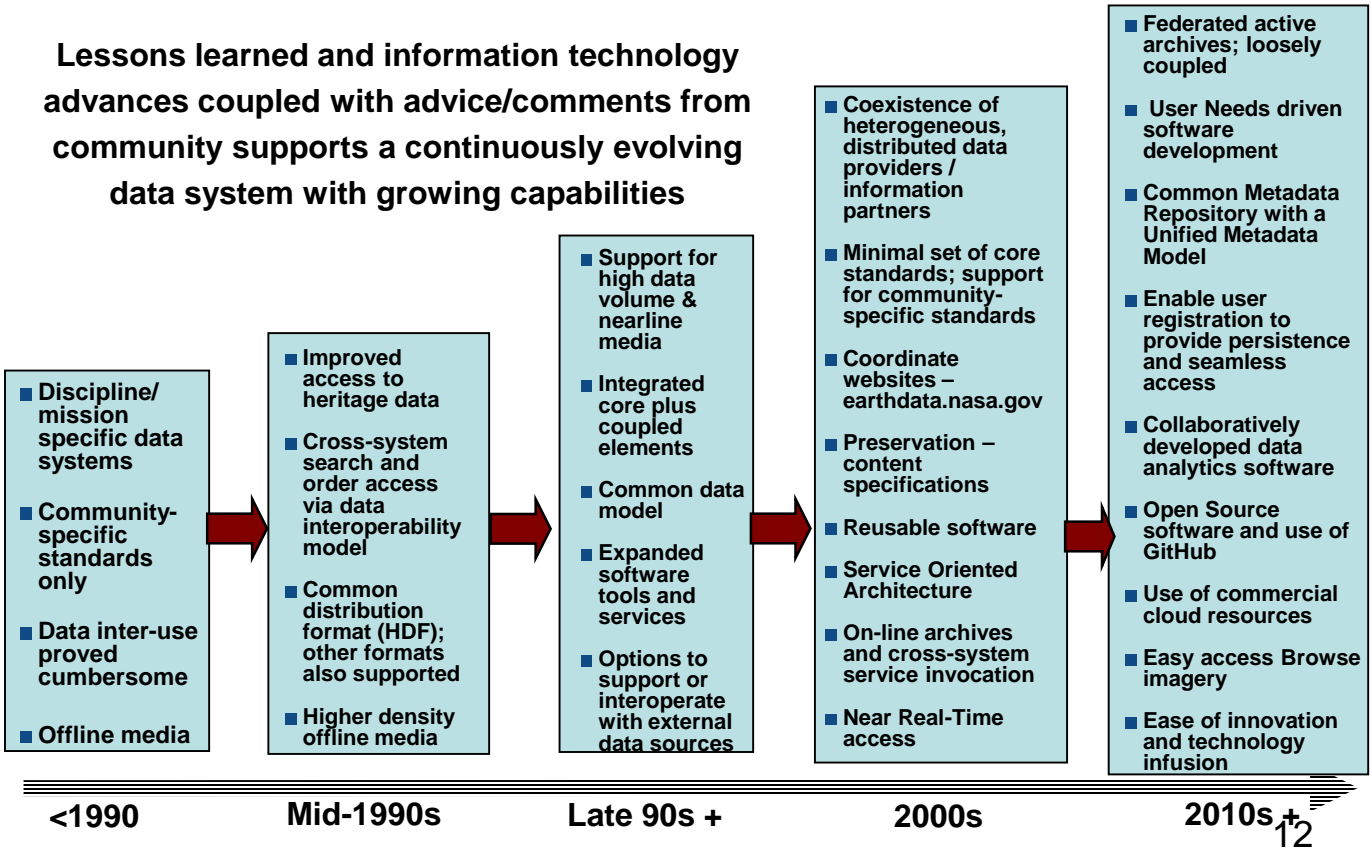


2020s 11

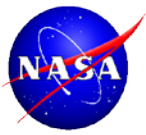
EOSDIS Technology Improvements and System Evolution



Lessons learned and information technology advances coupled with advice/comments from community supports a continuously evolving data system with growing capabilities

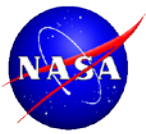


Conclusion



- ❑ **As a network of trusted repositories, NASA's EOSDIS has supported TRUST principles for over two decades**
- ❑ **Trust is essential for users to have confidence in our data**
- ❑ **Sustenance is essential to trust**
- ❑ **Trust is essential to sustenance**

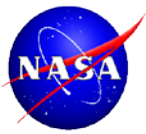
Being a Trustworthy Example



- The reputation of NASA and its Earth science data is golden and is built on the trust of its customers. There are several lessons learned in developing EOSDIS:
 - developing and evolving trustworthy repositories
 - building frameworks for keeping digital collections relevant in an environment that constantly changes
 - being responsiveness to a broad user community with differing perspectives, motives, and cultures
 - being forward-thinking on a flat budget

Thanks to all who make EOSDIS possible

References



- Ramapriyan *et al.* “Standards and Best Practices – Two NASA Examples” IN21D-0876, AGU Fall Meeting, 2019
- Ramapriyan, H. and Behnke, J., 2019. Importance and Incorporation of User Feedback in Earth Science Data Stewardship. *Data Science Journal*, 18(1), p.24. DOI: <http://doi.org/10.5334/dsj-2019-024>
- Ramapriyan & Lynnes, “Reusability in NASA’s Earth Observation System Data and Information System (EOSDIS)”, IN 21A-09, AGU Fall Meeting, 2019