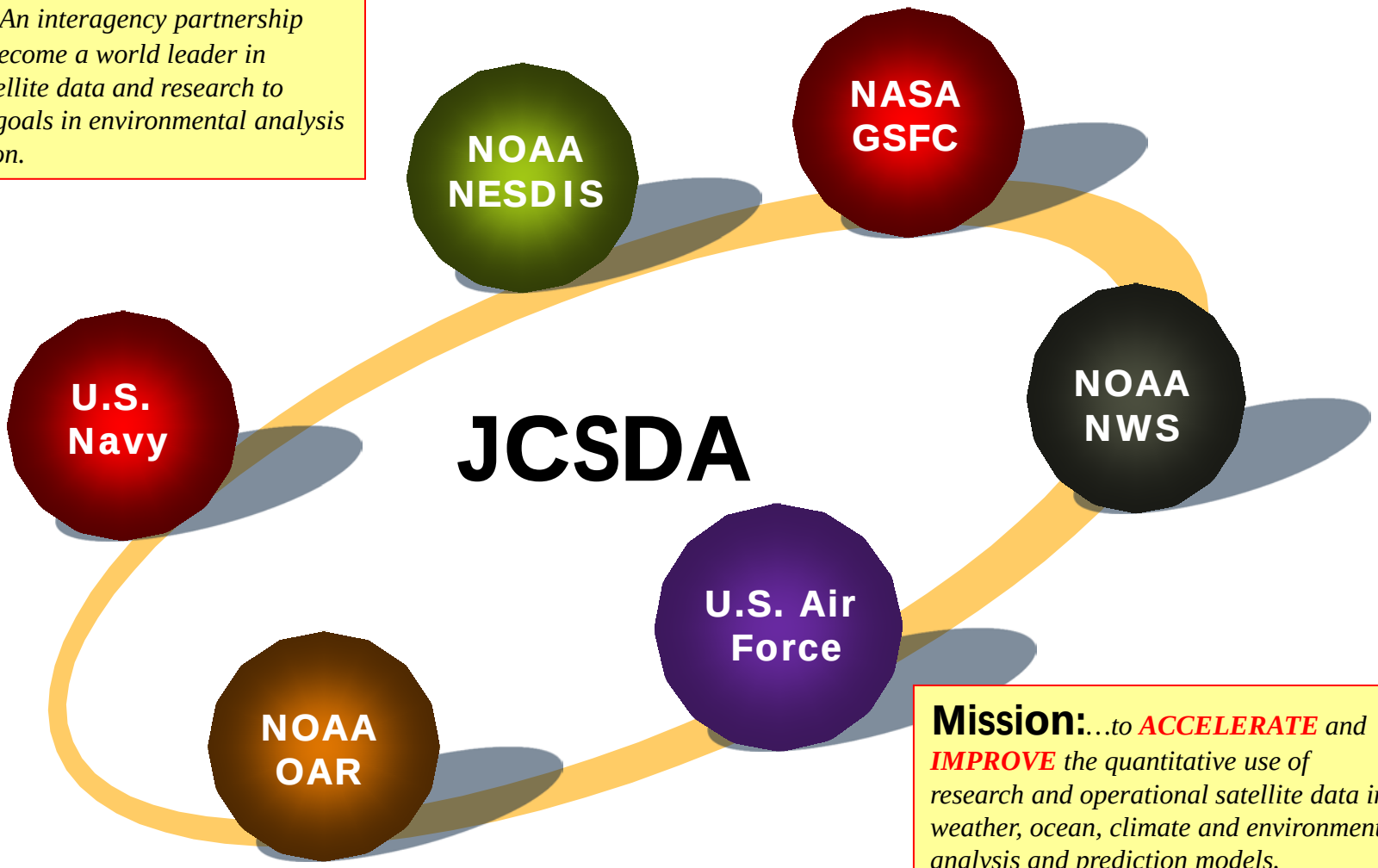
# Joint Center for Satellite Data Assimilation

Tom Auligné, JCSDA Director

# Description of the JCSDA

**Vision:** *An interagency partnership working to become a world leader in applying satellite data and research to operational goals in environmental analysis and prediction.*




**Mission:** *…to **ACCELERATE** and **IMPROVE** the quantitative use of research and operational satellite data in weather, ocean, climate and environmental analysis and prediction models.*

# JCSDA Mode of Operation

## JCSDA Mode of Operation

### Internal Research

- Directed by JCSDA affiliated scientists
- Research undertaken independently by partners, overlapping with JCSDA priorities
- Carried out by the partners
- Mixture of new and leveraged funding
- Short-term ROI expected

### External Research

- Grants and/or contracts awarded
- Administered alternately by NOAA, NASA
- Open to the broader research community
- Funding awarded competitively
- Near-term ROI expected

### Visiting Scientist Program

- Open to scientists from everywhere
- Short-term (a few weeks/months)
- Requires to Identify host at partner institution; work on JCSDA-relevant topic
- Mid-term ROI expected

### Coordination, Education & Outreach

- Workshops, …
- Colloquium, Seminar series, Quarterly newsletter, website
- Publications
- Meetings (ET, MOB, AA, SSC)
- Coordination: planning and reporting
- Management, admin support

### Systems Support

- **Offers O2R environment w/ Operational Code for Models & Data Assimilation Systems, and with operationally used data**
- Open to External scientists
- Goal: funnel efforts toward helping the JCSDA partners
- Access to HPC & operational systems in R&D
- S4 and JIBB

# Components of an O2R/R2O Infrastructure (1)

- **What Money can Buy….**
  - Supercomputer (Hardware, basic software, and IT) (*almost* the easiest part!)
  - Scientific Software Integration (this is the hardest part: keep in sync with operational models)
  - User Support & Documentation
  - Management of resources to allow R2O and O2R to be sustained
  - Documented Utilities to help scientists (CRTM, assessment, formatting tools)
  - Constant engagement between Research and Operations
  - Rigorous software configuration system to track changes
  - Rigorous (and independent) testing mechanism to demonstrate added value

# Components of an O2R/R2O Infrastructure (2)

- **What Money can NOT Buy….**
  - **And perhaps more importantly: the right culture.**
    - Transparency of R2O protocols and willingness to accept research performed by researchers & work collaboratively (on the operational partner)
    - Willingness to work/start with operational system and follow protocols and accept constructive feedback (on the research partner)
    - Sense of Mutual respect between Researchers and Operational partners: respect for innovation in research and pragmatism in the operational implementation

Accept that R2O is not for everyone: careful choice of research and operations partners is important

# Evolving Management: Improving "Jointness"

- JCSDA has been successful – but not resting on past success
- Deterrents to Collaboration
  - Immediate costs
  - Resources spread too thin
  - Dilution of goals, control, funding
- Risks for JCSDA
  - Disengagement
  - Restrictive vision of purview
  - Redundancy
- Need for improved incentives
  - Conditional resources
  - Support staff to facilitate collaboration
  - Vision of Common Path

# Joint Effort for Data assimilation Integration (JEDI)

*Nation Unified Next-generation Data Assimilation*

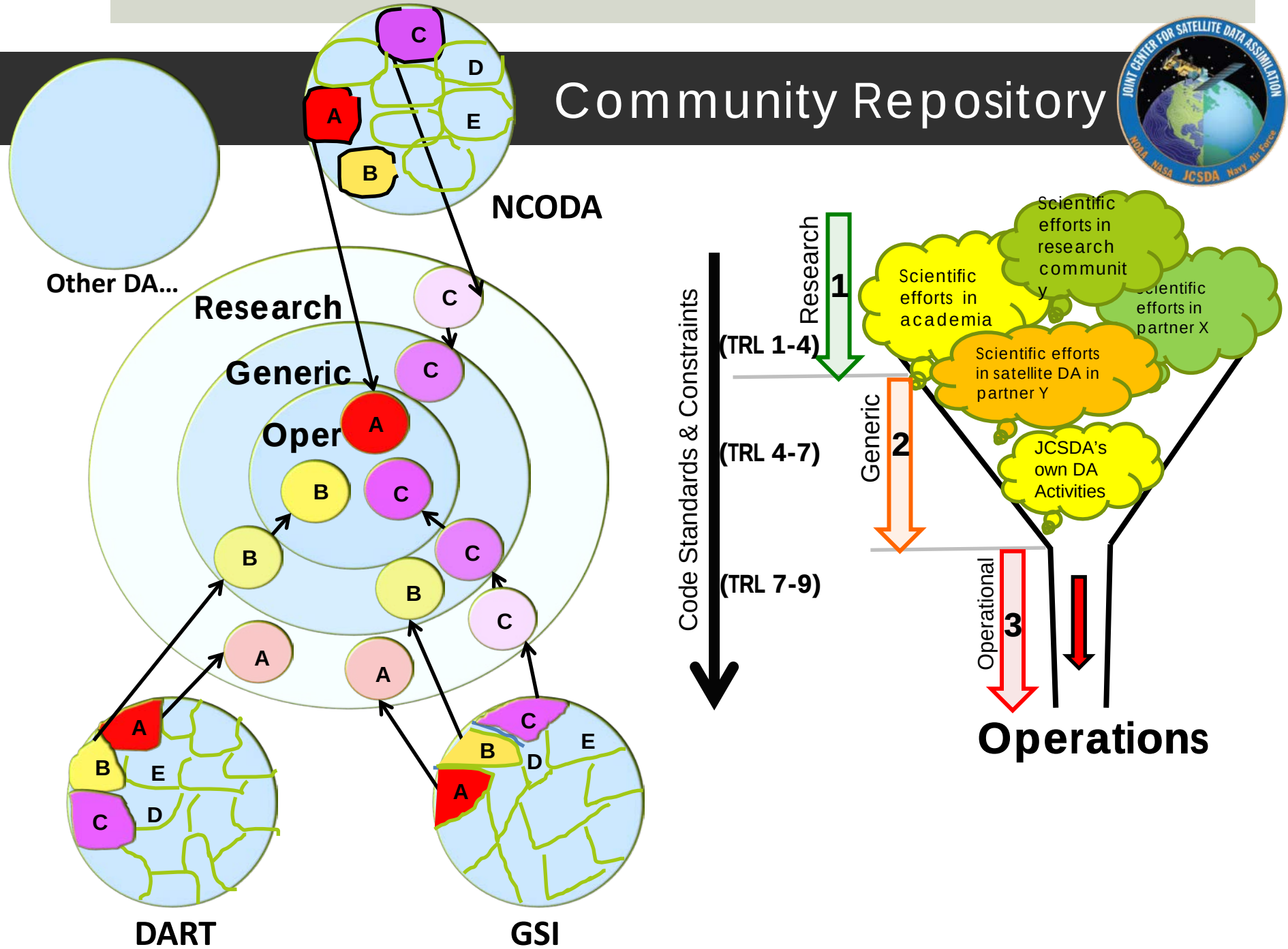
## STRATEGY

1. Collective path to unification, while allowing multiple levels of engagement
2. Modular, Object-Oriented code for flexibility, robustness and optimization
3. Mutualize **system-agnostic** components across
   - Applications (atmosphere, ocean, land, space weather, etc.)
   - Models & Grids (operational/research)
   - Observations (past, current and future)

## OBJECTIVES

1. Facilitate innovative developments addressing grand challenges
2. Increase **R2O** transition rate from community
3. Increase **science productivity** and **code performance**

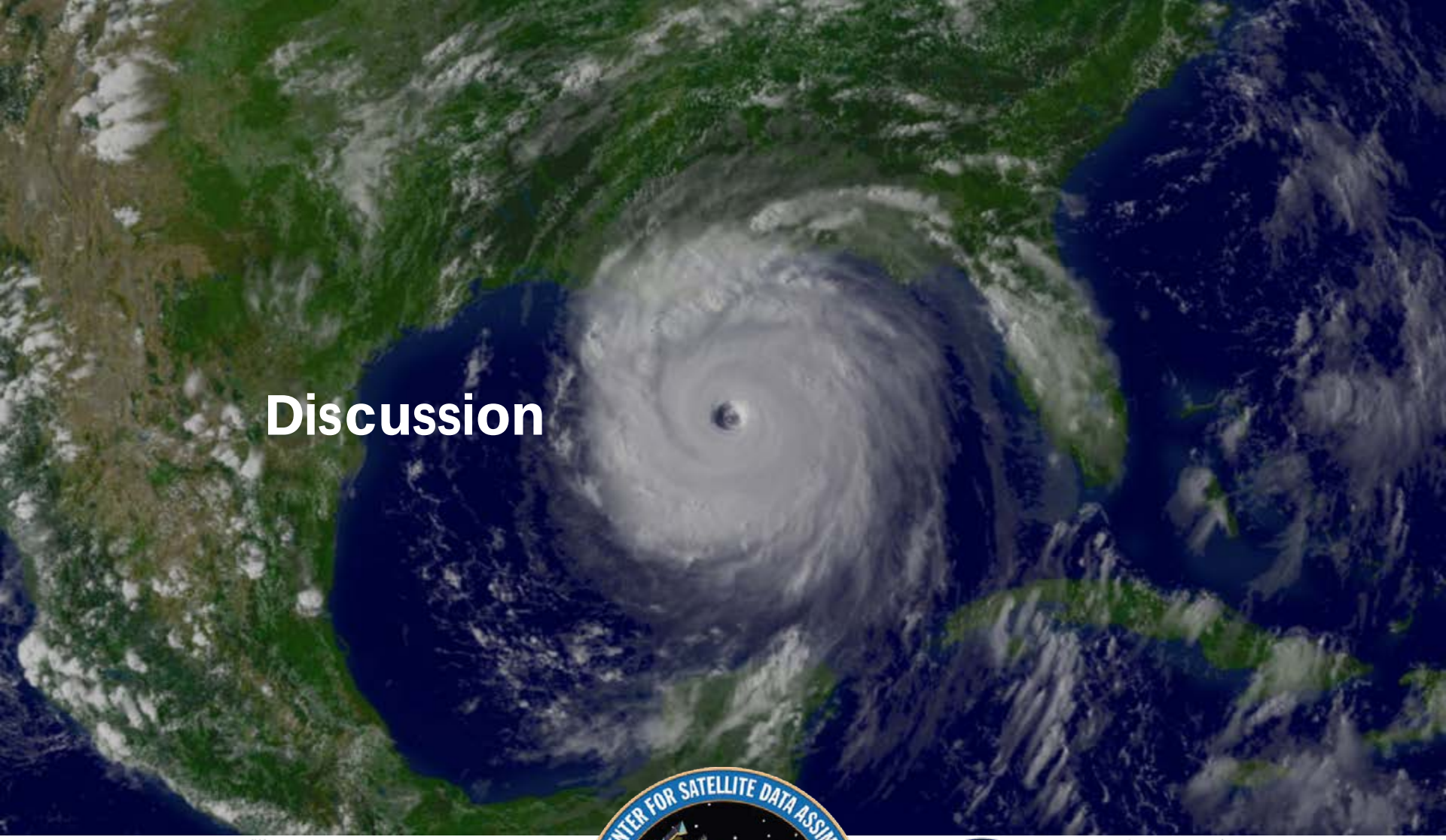
# Community Repository



# Summary

- Keys to success of O2R include
  - Identify community of partners with overlapping interests
  - Nurture communication and incentives for Research and Operational Communities
  - Clearly state objectives, approach, and purview
    - Development and adoption of Common Tools

- JCSDA
  - Analog from terrestrial weather R2O2R2O2R2O2…
  - Potential partner for satellite data assimilation



# Discussion