Defining Strategic Opportunities for the Programs: The BDEF Report

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NASA Biodiversity and Ecological Forecasting
Team Meeting (virtual)
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Joe Parks from Wikimedia
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Purpose

- Demonstrate role of satellite remote sensing
- Explore new ideas
- Identify program opportunities for next decade
  - “Considerations for NASA”

Audience

- NASA: program managers and others
- Researchers, industry, policy makers, natural resource managers
Origins

- 2007: Ocean Biology & Biogeochemistry
  - “Advanced Plan for OBB Research”
  - Update in progress
- 2015: Earth Surface and Interior
  - “Challenges and Opportunities for Research in ESI (2016)”
- 2019: Biological Diversity and Ecological Forecasting
  - In progress
Process

Assemble Working Group (non-NASA) →

Release Questionnaire (broad community)

Consolidate responses

Identify chapters…write…

……………Telecons……………

Outside review: ended 30 September

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Report Outline

- Executive Summary
- Chapter 1: Introduction
- Chapter 2: Biodiversity: What is biodiversity and why is it Important?
- Chapter 3: Drivers of Biodiversity
- Chapter 4: People, Biodiversity, and Ecosystem Services
- Chapter 5: Scales of Biodiversity
- Chapter 6: Biodiversity and Ecosystem Resilience
- Chapter 7: Predicting and Projecting Changes in Biodiversity and Ecosystem Services
- Chapter 8: Discussion of Considerations for NASA
Chapter Outline

1. Importance
2. Current State of Knowledge
3. What Is Needed
4. Considerations for NASA
Considerations for NASA

- 48 total, consolidated into six themes*

  - Biodiversity data products
  - Biodiversity observations in situ
  - Biodiversity observations from space
  - Biodiversity and ecological modeling and forecasting
  - Partnership and collaboration on biodiversity activities
  - Capacity for biodiversity research, applications, and monitoring

* Impossible to capture all Considerations
Considerations for NASA

- **Biodiversity Data Products**
  - Provide more higher-level data products, increase their breadth, and enhance their discoverability and usability
  - Landsat products
  - Research to operations
  - Formats
  - Standards
  - Multi-source integration

- **Biodiversity Observations in situ**
  - Improve in situ observations so they can better support understanding biodiversity from space
  - Partnerships
  - Guidance from models
  - New observational technology
  - Standardized protocols and formats
Considerations for NASA

- **Biodiversity Observations from Space**
  - Ensure the continued availability of biodiversity-relevant observations from space
  - Long-term continuity
  - New technology
  - International coordination
  - Open access
  - Value of remote sensing to society
  - Private industry partnerships

- **Biodiversity and Ecological Modeling and Forecasting**
  - Enhance and utilize models to forecast biodiversity change and its impacts, guide decisions and policies, and facilitate research
  - Community-scale cyberinfrastructure
  - Forecast output standards
  - Uncertainty quantification of outputs
  - Uncertainty quantification of inputs
Partnership and Collaboration on Biodiversity Activities

Seek out partnerships and collaborative activities to advance utilization of remote sensing for biodiversity research and societal benefit

- Multi-disciplinary project teams
- Collaborative problem solving
- International collaboration
- Integration across terrestrial, marine, and freshwater realms
- Closer ties to end-using orgs

Capacity for Biodiversity Research, Applications, & Monitoring

Support capacity development to increase utilization of NASA observations and biodiversity products

- Training
- Early career scientists
- Early start
- Undergraduate and graduate
Review Comments

- Comment medley:
  "This is going to be a powerful report!" "excellent report" "nice job!" "truly impressed" "true substance" "thoughtful insights, comprehensive coverage" "well-curated content, well-written" "great job summarizing complex issues"

- “There is little new or innovative content.”
- “many parts are so unspecific that they could have been written a decade ago”
- Structural (and length)
- “Considerations”: prioritize, increase actionability
- More on data access and usability
- Don’t neglect “applications to research”
- Good feedstock for next Decadal Survey