



NOAA's AI Transformation

Rob Redmon

Director, NOAA Center for Artificial Intelligence

Contributors:

NOAA Artificial Intelligence Executive Committee,
NCAI Team, NOAA AI Working Groups

Contact: noaa.gov/ai, ncai.team@noaa.gov

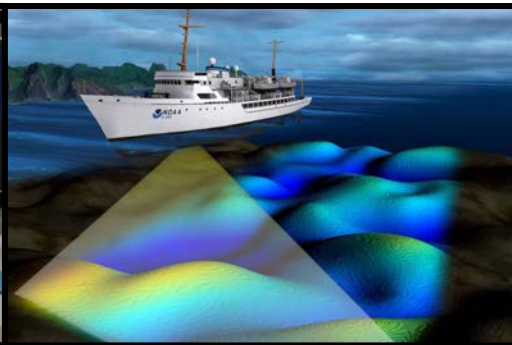
January 14, 2026
NSF CI Compass

Why AI for NOAA Mission Delivery?

PEOPLE



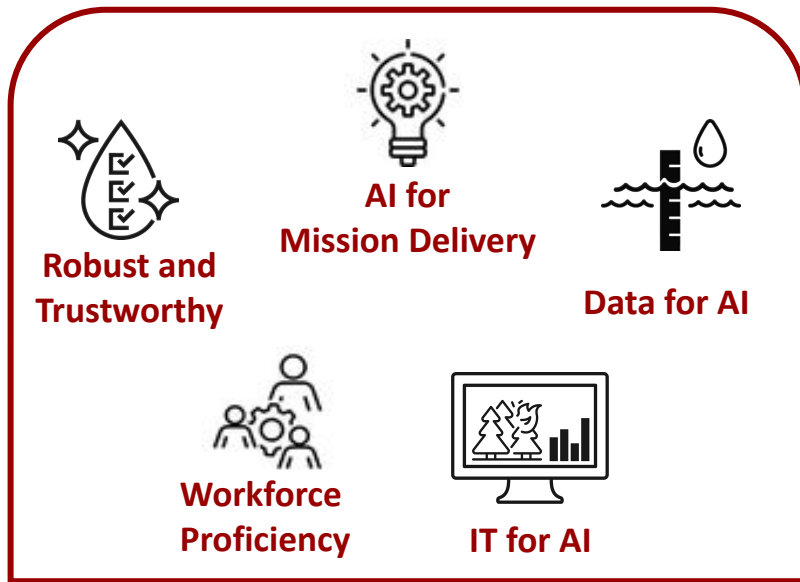
MISSION



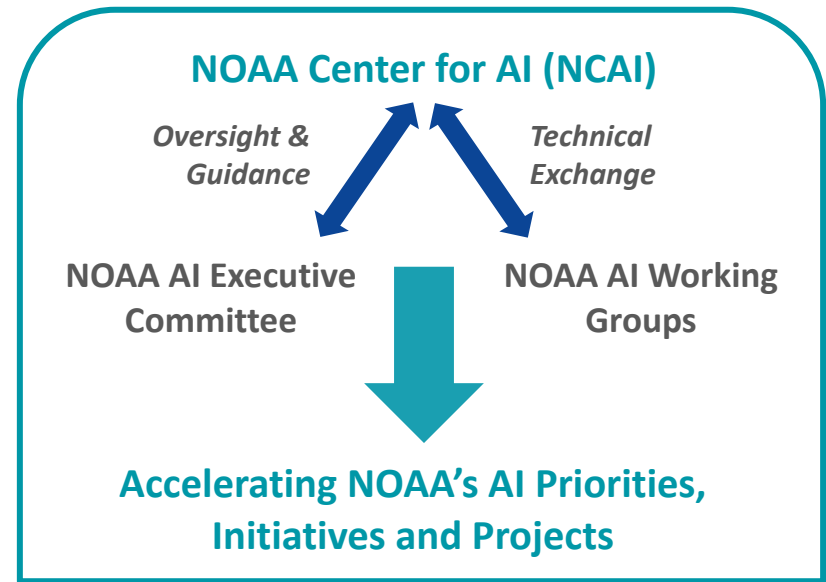
NOAA's AI Direction

Critical for NOAA to rapidly, effectively, and responsibly leverage AI

What We Need



How We'll Succeed





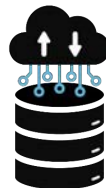
NOAA Center for AI

AI Workflows



Training

AI Data Standards



Data Governance
Data Management Tools
AI Ready ML Training Data

Inside NOAA

[Resources](#)
[Community Chat](#)

Publicly

noaa.gov/ai
ncai.team@noaa.gov

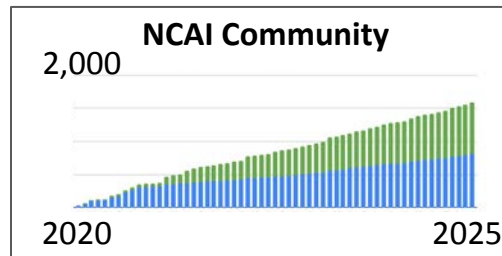
Partnerships Engagement

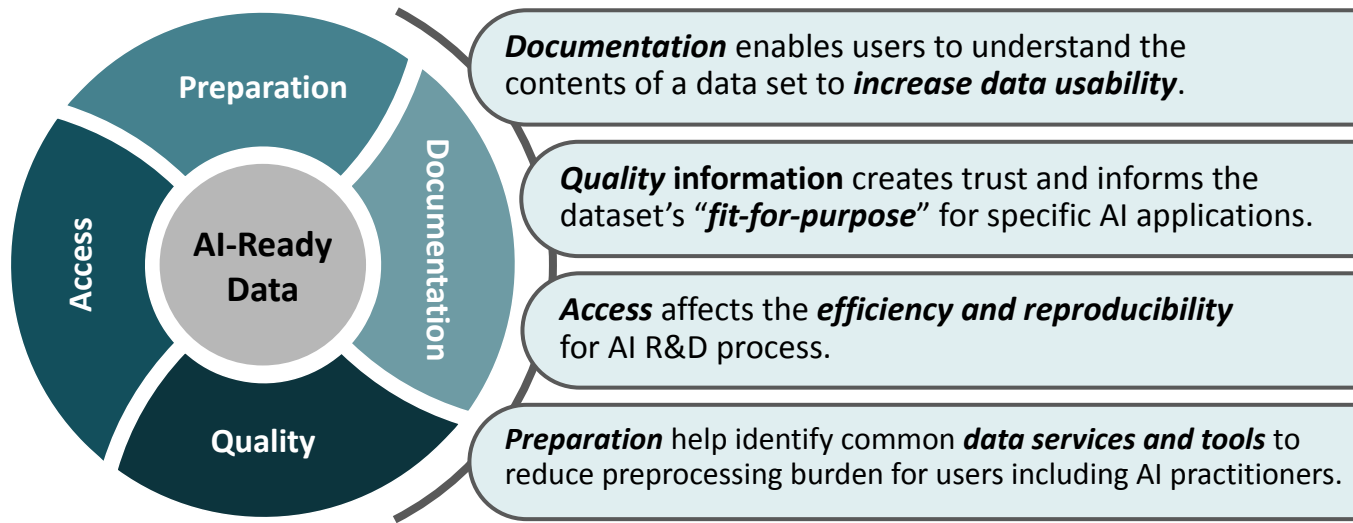
Communities of Practice


8th AI Workshop in 2026
noaa.gov/ai/events



AI for Human Workflows
e.g. 





Community Resources:

- [ESIP Data Readiness](#)
- NOAA AI Data WG under the Data Governance Committee, contact Douglas Rao, Tyler Christensen, Rob Redmon.

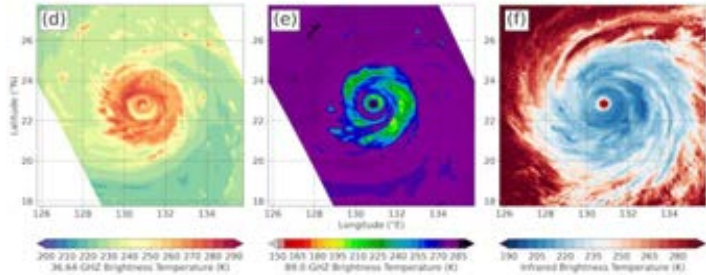
Earth Science Information Partners (ESIP) Data Readiness Cluster (github.com/ESIPFed/data-readiness) is a community forum including agencies (NOAA, NASA, USGS, DOE, USAF, Met Office, etc), private sectors, and academia to:

- Understand users' data needs for AI/ML Research and Development with Earth system science data
- Develop community standards, leading practices & tools for AI-ready data

AI-Ready Data – Accelerating AI for Weather

(a) TC PRIMED **TC**⁹

Tropical Cyclone **P**recipitation, Infrared, Microwave, and Environmental Dataset



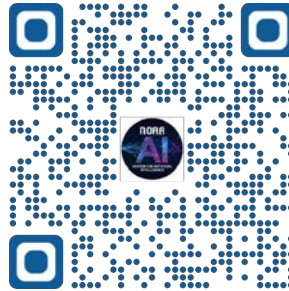
(b) Offshore Wind Profiles

Offshore vertical wind profiles provide valuable coastal knowledge, e.g. for offshore industry siting and coastal weather modeling



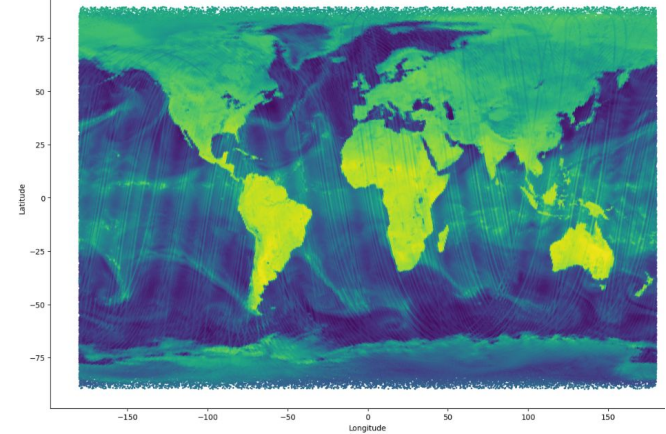
(c) NOAA-NASA Joint Archive (NNJA-AI)

```
from nnja import DataCatalog
catalog = DataCatalog(skip_manifest=True)
amsu_ds = catalog['amsua-1bamua-NC021023'].load_manifest().sel(
    time='2021-01-01 00Z',
    variables=['LAT', 'LON', 'TMBR_00001']
)
df = amsu_ds.load_dataset(backend='pandas')
plot_df(df, 'TMBR_00001')
```



NCAI AI-ready Data
and Learning Journeys
[noaa.gov/ai/resources/
learning-journey-library](https://noaa.gov/ai/resources/learning-journey-library)

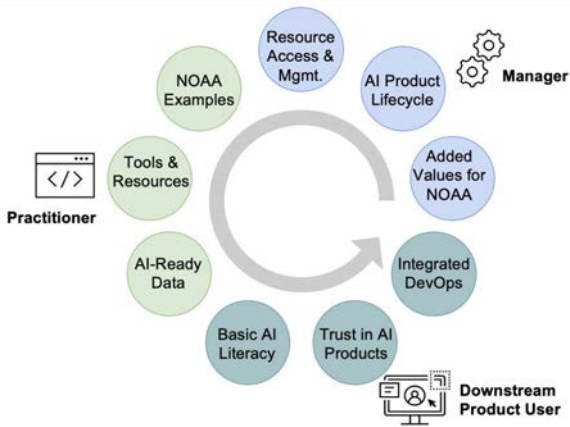
AMSU Brightness Temperature



[epic.noaa.gov/noaa-nasa-observational-
archive-reanalysis-ai-friendly-format/](https://epic.noaa.gov/noaa-nasa-observational-archive-reanalysis-ai-friendly-format/)

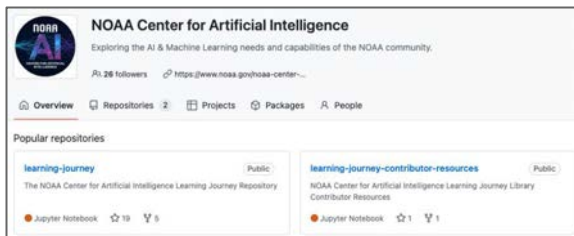
Workforce Training – Responsible AI

Understanding NOAA training needs and gaps



noaa.gov/ai/resources

Facilitating resource development & curation



Rip currents, tropical cyclones, offshore wind, geomagnetic navigation, ocean acoustics, and many more

github.com/noaa-ncai

Enabling workforce & building competency



Hosting training events / tutorials on AI topics relevant to NOAA missions

Examples: NOAA's AI Show and Tell, Gemini Office Hours, and EPIC Learning Journey Tutorial



Knowledge Mesh and Digital Twins

- **Operations - Open Information Stewardship Service (OISS) Digital Factory**

- Self-service orchestration, part of NESDIS Common Cloud Framework; based on the NOAA Digital Twin Earth Framework Specification (DTE-FS). Enables NOAA users to create and manage individual Digital Twins maintaining full interoperability. AI-ready 'Digital Record' automatically 'shadows' workflows. 80TB of data being managed by OISS.

- **Community and Partnerships**

- NOAA Coastal Zone Digital Twin Community of Practice; NOAA/NASA/CNES Earth Systems Digital Twin Pilot; NSF [Open Knowledge Network](#) (OKN) demonstration (manuscript in preparation).
- IEEE Standards Association [P3501](#) "*Recommended Practice for Developing Digital Twins of the Earth*"
- Upcoming Workshops NSF Digital Twins I/UCRC (<https://digitaltwin.stcenter.net/>)

- **Research**

- Earth Observing-Digital Twin (EO-DT) Broad Agency Study released by NOAA in September 2025 - [Industry Study: AI-Driven Digital Twin Technology Could Improve NOAA's Ability To Integrate Diverse Environmental Observations](#)
- Booz Allen Hamilton Knowledge Mesh study is complete and final report published, code being evaluated and will be released on NOAA github - [A Study to Determine Natural Language Processing Capabilities with NCCF Open Knowledge Mesh \(KM/NLP\)](#)...
- Noblis Knowledge Mesh study is complete - upcoming report to focus on geospatial knowledge mesh construction, virtualized queries, and digital twin federation, with code to follow - [Enabling Open Discovery and Decision-Making with a Knowledge Mesh](#)...
- [Orion/Arcfield](#) and [Element84](#) teams are both entering their second year of KM study efforts to conclude in December 2026

For additional information, contact Ryan.Berkheimer@noaa.gov, Jennifer.Webster@noaa.gov.



NOAA AI – noaa.gov/ai

Build **Trustworthy AI**
together

Scan QR to access the
NCAI resource hub

Join our
Community of Practice



Summary of our growing partnerships—not an exhaustive list.