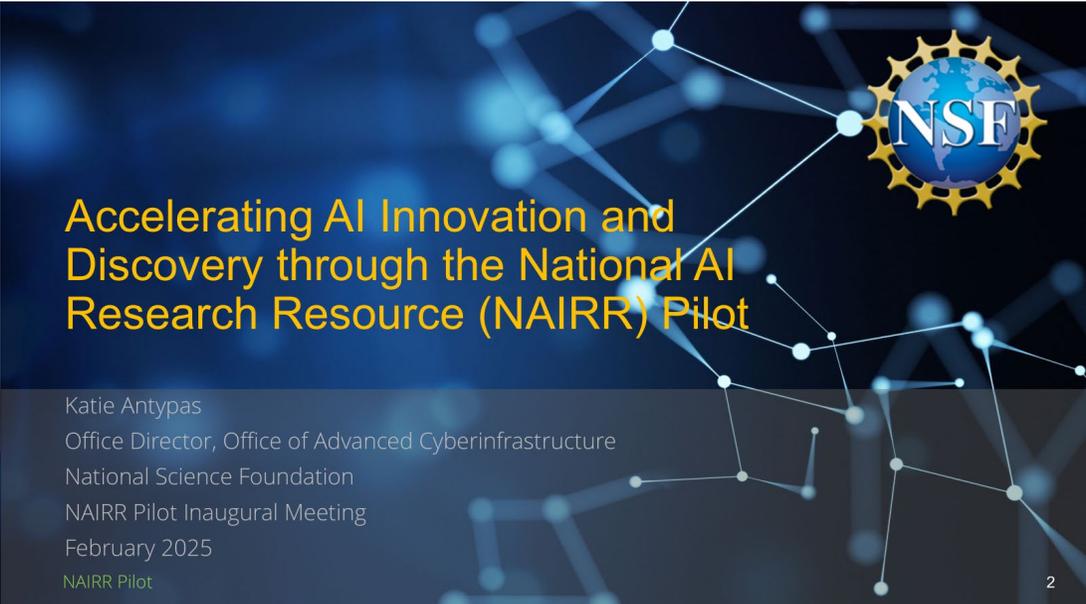# NAIRR Pilot Update: Progress and Next Steps

John Towns
NCSA Deputy Director
jtowns@illinois.edu

PI, ACCESS Coordination Office

Co-Chair, NAIRR Pilot Allocations Working Group

Some slides courtesy Katie Antypas, NSF

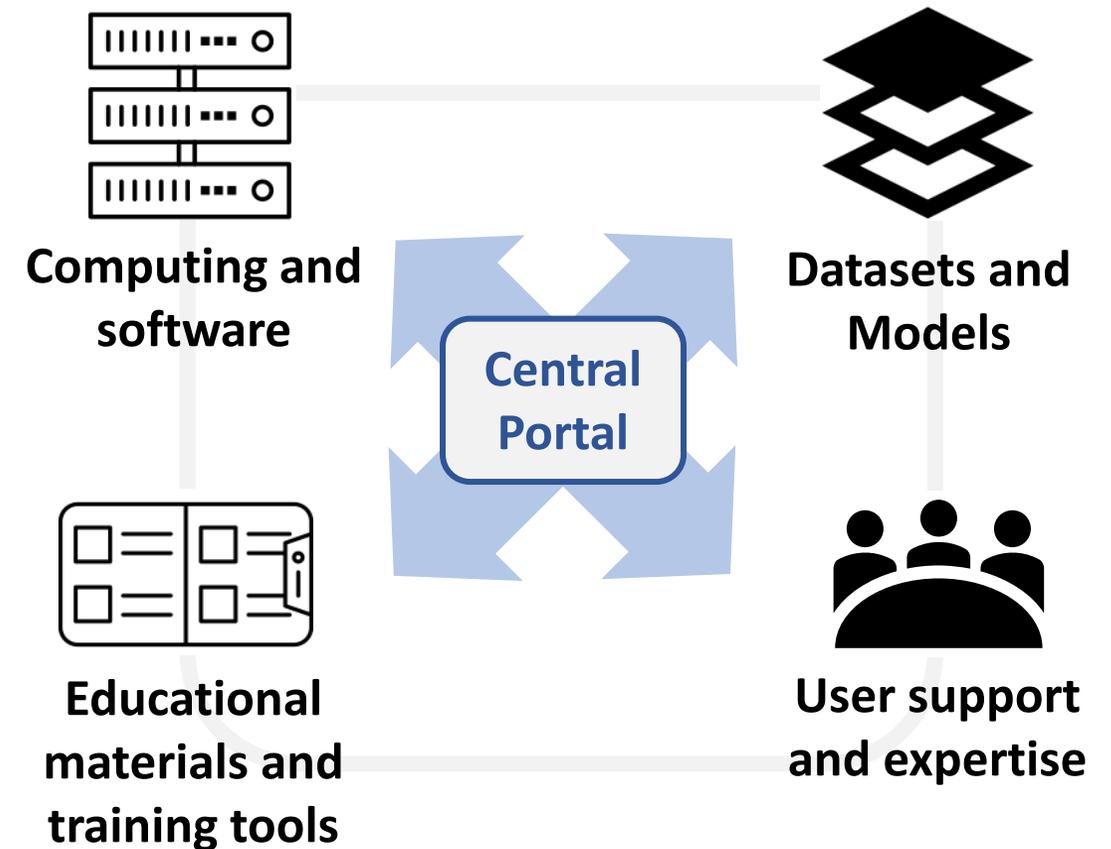**Accelerating AI Innovation and Discovery through the National AI Research Resource (NAIRR) Pilot**

Katie Antypas
Office Director, Office of Advanced Cyberinfrastructure
National Science Foundation
NAIRR Pilot Inaugural Meeting
February 2025
NAIRR Pilot

2

ILLINOIS NCSA

NAIRR Vision: A national research infrastructure to drive US AI innovation, discovery and national competitiveness

National goals

- Accelerate AI and AI-powered discovery and innovation.

- Expand the US AI R&D workforce and train the next generation of AI researchers and educators.

- Increase integration and use of world-class public and commercial AI resources.

- Advance public trust in AI

Envisioned NAIRR Architecture

Computing and software

Datasets and Models

Central Portal

Educational materials and training tools

User support and expertise

NAIRR Pilot: history and timeline to date

Jan 2021   National Artificial Intelligence Initiative Act of 2020* directs NSF and OSTP to convene a **Task Force** on the feasibility of a National AI Research Resource.

Jan 2023   The NAIRR Task Force delivers an ambitious **implementation plan** and suggests starting <u>a pilot</u>.

Jan 2024   NSF and OSTP launch the **NAIRR Pilot** with agency, industry and non-profit partners

Jan 2025   The NAIRR Pilot is now serving **hundreds of researchers and educators** with compute, data, model, and educational resources at all scales.

*PL 116-283, National Defense Authorization Act for FY 2021, Division E, Sec. 5106

Strengthening and Democratizing the U.S. Artificial Intelligence Innovation Ecosystem

An Implementation Plan for a National Artificial Intelligence Research Resource

January 2023

[Summary website for NAIRR and NAIRR Pilot](#)

NAIRR Pilot
National Artificial Intelligence Research Resource Pilot

User portal: [nairrpilot.org](#)

Many agencies are contributing and collaborating

DARPA

DOD

DOE

DoEd

FDA

NASA

NIH

NIST

NOAA

NSF

USDA

USGS

USPTO

VA

Computing
NSF and DOE

10+ advanced computing systems at national and extreme scales.

Datasets & Models
DoD DOE NASA NIH NOAA
USDA USGS USPTO

25 open datasets, models, platforms and more available on NAIRR Pilot Portal. Increasing integration with compute

NAIRR Secure
Leads: DOE and NIH

Three demonstration projects underway, coordinated through NAIRR Secure WG

Platforms, Software, Educational materials
Multiple agencies

Software Workshop (NSF and DOE lead).
Education materials and tools

Governance
All contributing agencies

- Steering Committee
- Pilot Program Management Office
- Data/Models, Secure & Education/Outreach WGs

26 industry and non-profit partners are contributing *in kind* state-of-the-art resources

- AI2: Allen Institute for AI
- AMD
- Amazon Web Services
- Anthropic
- Cerebras
- Databricks
- Datavant
- EleutherAI
- Google
- Groq
- Hewlett Packard Enterprise
- Hugging Face
- IBM

- Intel
- Meta
- Microsoft
- MLCommons
- NVIDIA
- Omidyar Networks
- OpenAI
- OpenMined
- Palantir
- Regenstrief Institute
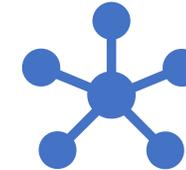- SambaNova Systems
- Vocareum
- Weights & Biases

Research Resources
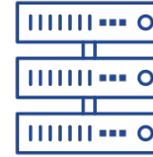
Computing

Datasets

Models, software, platforms

Educational/training opportunities

Collaborations

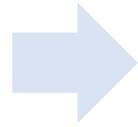# Pilot Year 1: We built the key foundations needed for a full NAIRR

Establish strong govt-industry partnership

A new multi-lateral model based on voluntary in-kind contributions to bring the most advanced resources to US researchers
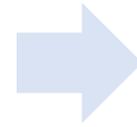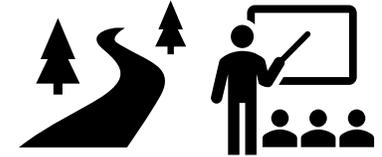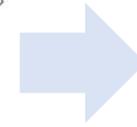
Integrate & deliver contributed resources

Back-end operations to exploit and track all contributed resources: compute, data, models, expertise

Establish single access point for US users

Portal deployment, request process, on boarding, resource matching, support, training

Expand AI research & education pathways

Technical Demo Projects, NAIRR Secure, NAIRR Classroom, community workshops & outreach, data set contributions

Results

14 agencies
26 industry and non-profit partners

80% of partner resources are engaged and being utilized

600+ requests to date
275+ approved projects underway in **43** states

Initiated **over 20** funded projects and pilots
--> Focus of Y2

Researchers and educators can apply for resources Now!

NAIRR Pilot
Portal

https://nairrpilot.org

CLASSROOM AND EDUCATOR RESOURCES

Request access to educational platforms (such as Juypter notebooks).

Apply

RESEARCHER RESOURCES

Request access to advanced computing, cloud computing, models, software, platforms, and collaborations.

Apply

DATA, MODELS, AND MORE

Additional government and government-funded resources that do not require an application.

View

Agency and Non-govt Resources Available to Community

Frontera – UT Austin

Anvil – Purdue

Expanse/Voyager UCSD

Delta – U. Of Illinois

Neocortex
Bridges 2 – U. Pittsburgh/CMU

Jetstream 2 – Indiana U

ACES - Texas A&M University

U.S. DEPARTMENT OF **ENERGY**
Office of Science
NAIRR Pilot
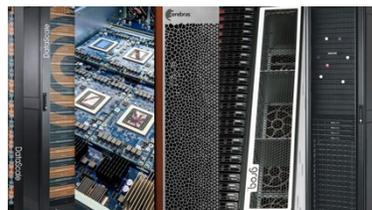
AI Testbed – Argonne National Lab

CloudLab

aws

Microsoft Azure

Vocareum

databricks

OpenMined

Weights & Biases

Hugging Face

Google Cloud

OpenAI

nVIDIA.

EleutherAI

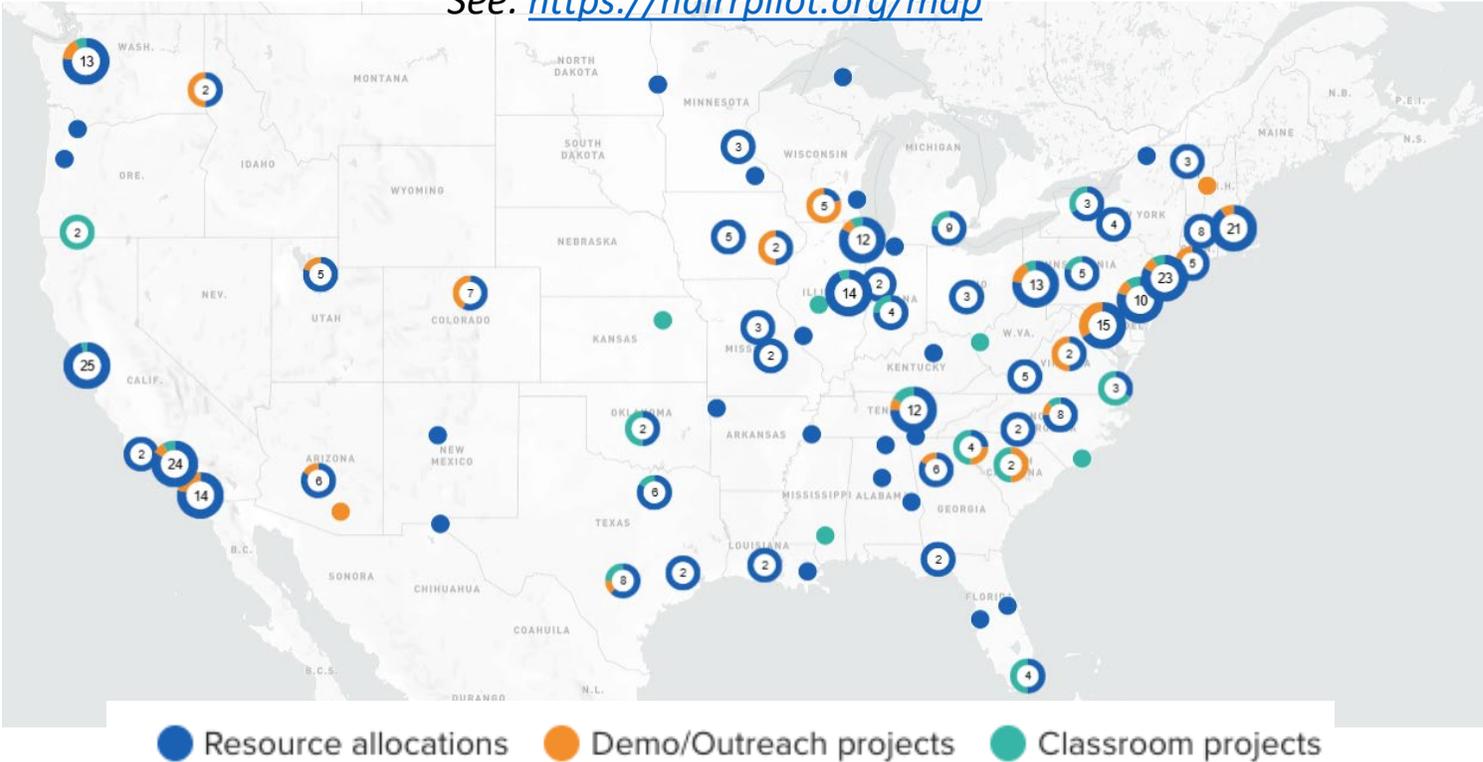SambaNova SYSTEMS

9

cerebras

ANTHROP\C

8

Training the next generation of AI researchers and leaders across the country

375+ Research projects supported across 43 states

See: https://nairrpilot.org/map

● Resource allocations ● Demo/Outreach projects ● Classroom projects

Researchers must be US based. Researchers come with funding support from 11 different agencies including NSF, NIH, NOAA, DOE, DOD, DARPA, ONR, ARO, NASA, USDA and VA as well as foundation and non-profit funding.

NAIRR Pilot Allocations by Science Category
(A100 GPU hours equiv)

- CS, AI and Intelligent Systems 41%
- Geology, Earth, Environmental Sci 15%
- Ecology 11%
- Astronomy 6%
- Materials Sci
- Biology
- Health/Clinical Sciences
- Physics
- Engineering
- Other
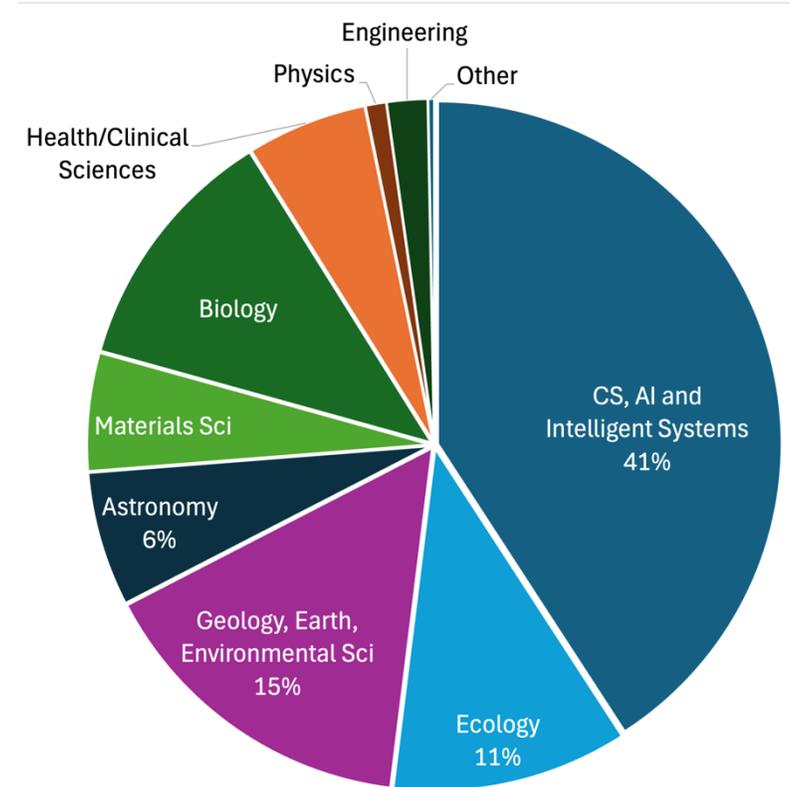
NAIRR Pilot Events Advance Goals

- NAIRR Pilot Software Workshop
  - Hosted by Argonne @ Argonne, Dec 3-4, 2024
    - [Meeting website](#)

- NAIRR Portal Workshop
  - Hosted by SGX3 @ SDSC, Feb 4-5, 2025
    - [Meeting website](#)

- NAIRR Pilot Annual Meeting
  - Hosted by Internet2 (part of NAIRR Pilot award), Feb 19-21, 2025
    - [Meeting website](#)
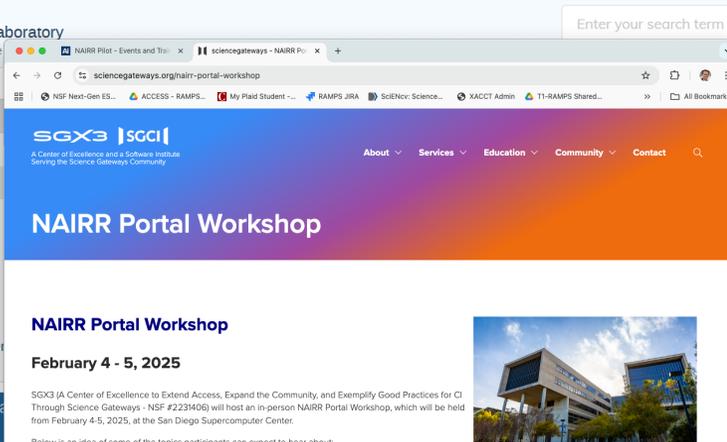
Insights and Lessons From Year 1

|	
The public-private partnership model is VERY advantageous.	• Delivers a much richer array of resources and expertise compared to a public-only model.
High demand for the array of NAIRR Pilot AI resources.	• Many research and education topics, use cases, and project sizes • Ways of accessing compute may need to be faster and more interactive; consortia may be needed for the largest scales • Demand for secure AI resources for sensitive data and uses cases.
Intensive coordination is key to connect partners, resources, and users	• Constant contact, clear channels, and nimbleness have been key • Significant appetite for workshops and training on using resources.
Access to trusted data and their integration are central challenges	• Needs are very varied across projects and disciplines • AI data infrastructure capabilities must be co-designed with communities and with specific use cases in mind.
Important to measure performance, impact, and success along the way.	• A full NAIRR will need both near-term and longitudinal assessments • Must identify and relieve pain points for users across NAIRR steps.

Preparing for the full NAIRR at scale and speed

National Goals

- Accelerate AI innovation
- Expand US AI workforce
- Provide world-class resources
- Advance Public trust in AI

Vision for the Full NAIRR

Key Performance Points

- Easily accessible resources via a portal.
- Seamless integration of data, models, software & compute.
- Extensive support via expertise and training.
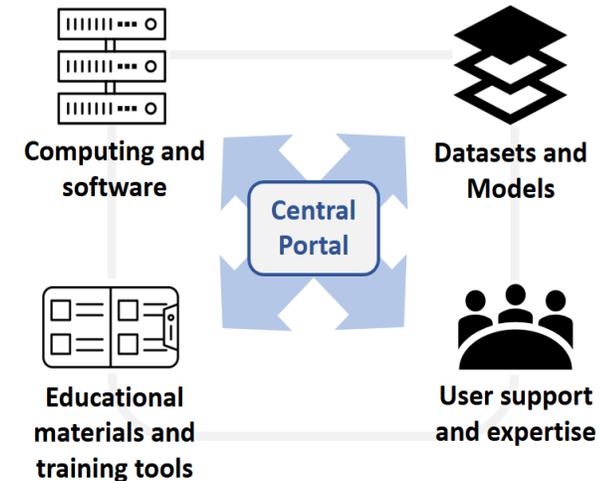
Pilot Year 2 Plan

- Finalize design and governance blueprint
- Augment user support, training and operational efficiencies
- Follow up on lessons learned
- Develop metrics for full NAIRR

Full NAIRR Legislation in Process

- Legislation to fund the full NAIRR introduced in House on March 26, 2025
  - H.R.2385: CREATE AI Act of 2025
    - Referred to House Committee on Science, Space, and Technology
  - Disturbing language
    - Added to 15 USC 9401 et seq (Nat AI Act of 2020)
    - SEC. 5605 NAIRR FUNDING
    - "To carry out this title, to the maximum extent possible, the NAIRR is authorized to accept and use donations of cash, services and personal property from the private sector."

State-of-the-Art Data Center

- The National Petascale Computing Facility (NPCF) is a state-of-the-art data center for research computing and data
  - 20,000 sq ft machine room
  - liquid cooling reduces utility costs, aids meeting "green campus" targets
  - 24 MW usable power (32 MW total in 4 x 8MW)
  - 400 Gb/s network bandwidth to Internet
  - cybersecurity for networking and systems
  - separate secure computing enclave within NPCF
  - UIUC updating cooling and power for part of space
- Great asset for UIUC and UI System
- Few if any universities in the US have anything like NPCF

I ILLINOIS NCSA