

# NCAI Dev Team: Workforce Development

## 2021 Pilot Resource Gap Assessment

### Executive Summary

As part of the NOAA Artificial Intelligence strategy, the NOAA Center for Artificial Intelligence (NCAI) conducted a pilot training resource gap assessment in Spring 2021. The primary purpose of the assessment was to gather training deficiencies, needs, and priorities across the NOAA workforce.

Survey respondents agreed that NOAA currently lacks sufficient access to training to incorporate artificial intelligence (AI) in ways that would contribute to the overall NOAA mission. Respondents indicated that this prohibits the ability of the workforce to become AI literate and proficient. At all levels of NOAA and with different roles in the AI development cycle, respondents requested access to NOAA-specific training material using NOAA data and computing resources to remove common barriers to the “Research to Operations, Applications, and Services” pipeline.

To address the workforce training needs, resource creation should be prioritized to convert NOAA AI success stories into interactive training material in a computing environment that allows the workforce to immediately apply learning outcomes to support NOAA’s mission via the AI strategy.

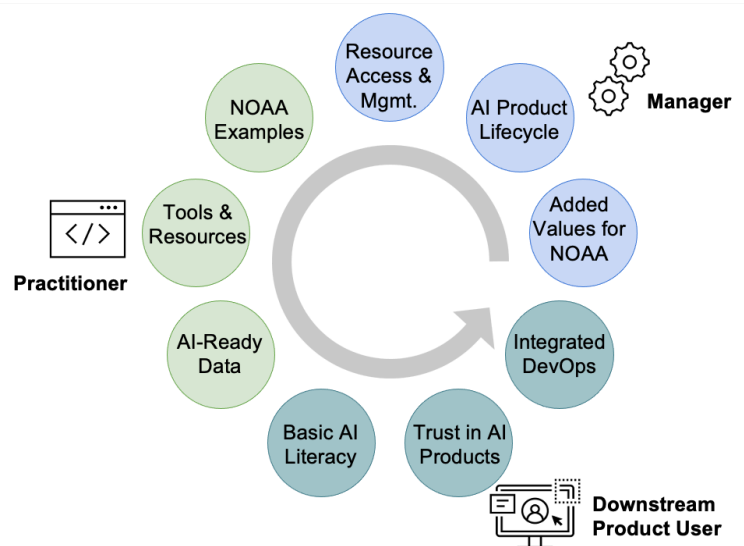


Figure 1. NOAA training action priority lifecycle highlighted by workforce role and relationship to AI.

### Training Priorities and AI Initiatives

Survey respondents were asked whether NOAA has access to sufficient resources on AI subject areas and training for implementing AI across components of the value chain. For the top three AI subject areas (Table 1) and value chain components (Table 2), most survey respondents indicate that they “Disagree” or “Strongly Disagree” that they have access to the materials that they need, either at the NOAA or line office (LO) level.

**Table 1.** Top 3 ranking for “Which of the following training subjects do you think is important and NCAI should prioritize?” across all self-identified “roles.”

AI subject area material
1. Creating training data, annotation/labeling, performance metrics
2. Basic 101 baseline
3. Research to operations, applications and services

**Table 2.** Top 3 ranking for “Which components of the value chain would you like to see AI/ML technique resources for?” across all self-identified “roles.”

Value chain components
1. Data processing pipelines or workflow automation
2. Feature detection in observations
3. Prediction tasks

## Actions from Role or Relationship to AI

Survey takers were asked to self-identify their role(s) as related to AI:

1. Downstream product user (e.g., forecaster, operations),
2. Practitioner (e.g., physical scientist, product developer, data manager/steward), and
3. Managerial (e.g., project manager, director, chief).

From each role, common training priorities and actions suggested by respondents are identified in the following summary (also in Figure 1).

### Downstream Product User

- Create targeted, domain-specific basic AI literacy training to help product users understand the lifecycle of AI product development
- Design training on the trustworthiness of AI products and how to evaluate AI algorithms using domain specific metrics for direct comparison against existing products
- Facilitate training and events (e.g., roadshow, development sprint, and hackathon-style activities) to integrate users into AI development cycles within NOAA

### Practitioners

- Continue NCAI’s plan to create NOAA-specific learning journeys by leveraging success stories from the communities of practice that incorporate new tools and programming languages.
- Create a sandbox environment that provides tools to learn AI and enables initial AI application development with NOAA data using NOAA computing resources, including the cloud environment.
- Provide tools and training on how to develop and access AI-ready data that meets the AI-ready data standard developed by NCAI in collaboration with other partners.

### Managers

- Develop basic AI training that highlights NOAA AI success stories and addresses potential AI limitations for NOAA’s mission
- Provide guidance for AI development lifecycles (including research-to-operation and user integration) and resources needed to support AI development and maintenance
- Supply information on how to access and locate training resources for distribution among team members

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