

# Update on WMO AI for Weather Activities and Capacity Development Considerations

CDP-

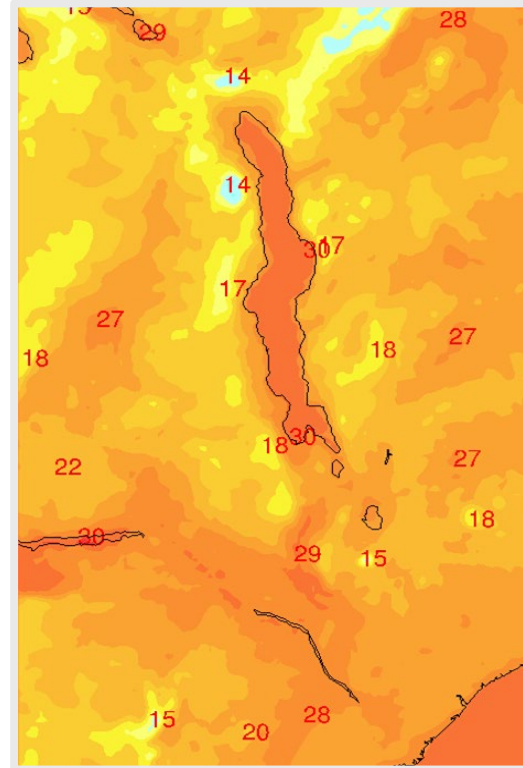
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September 25, 2025

# A revolution in the prediction landscape with potential for capacity development

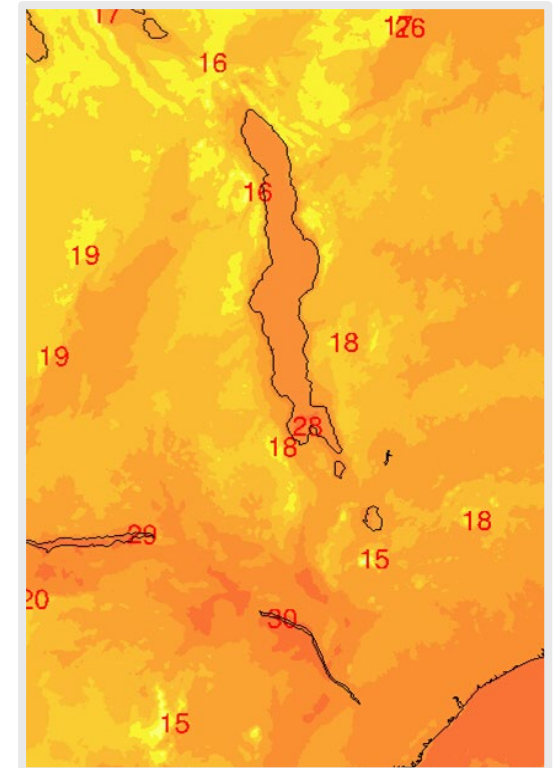
Results from  
early  
September  
2025

- Run of an AI-WP model over Malawi by Malawi staff
- Using Anemoi framework Forecast-in-a-Box to run Bris (MetNo) at DCCMS (Malawi) on affordable hardware.
- Downscale global data as input data to Bris.
- Runs model on: Mac Studio M4 with 128G memory, 40 GPU cores, 16 CPU cores, cost about \$5000.

**Bris-Malawi**

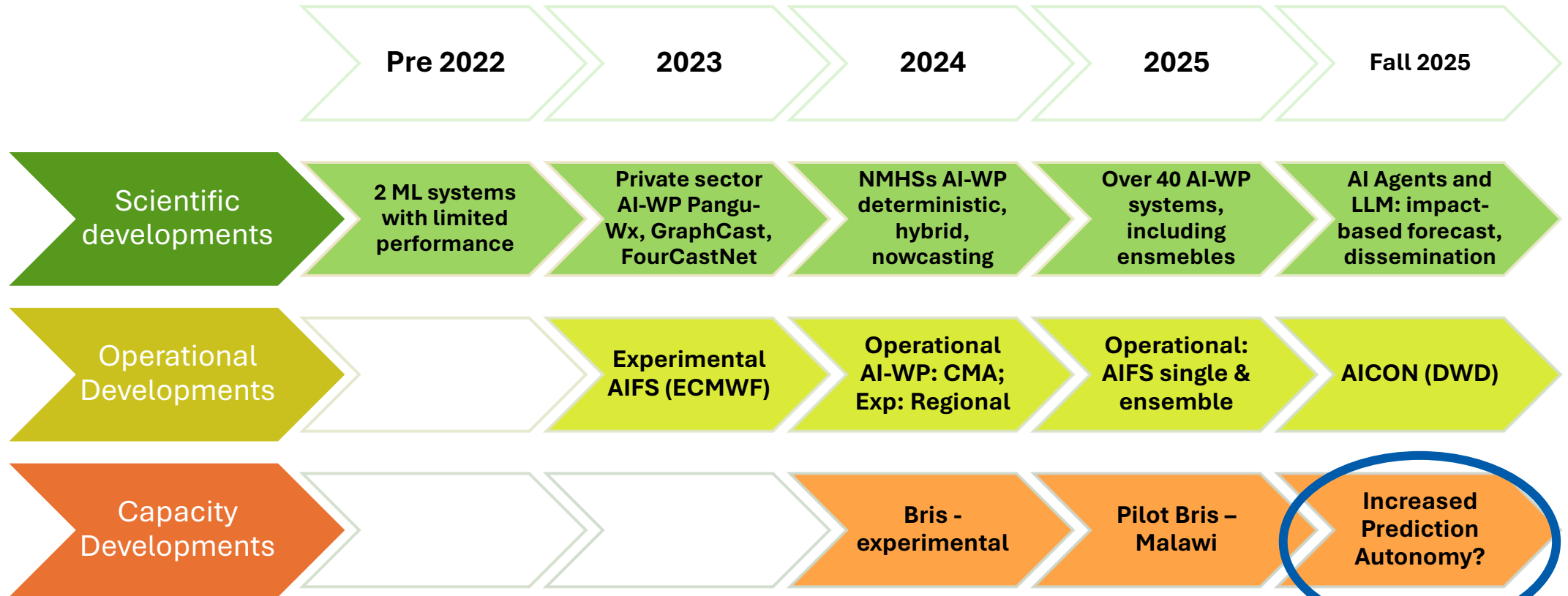


**COSMO**



*Fig: 2m temperature field (courtesy of Amos Mtonya, Lene Østvand and Roar Skålin) from AI-WP and COSMO*

# Unprecedented pace of transformation, including for LMIC

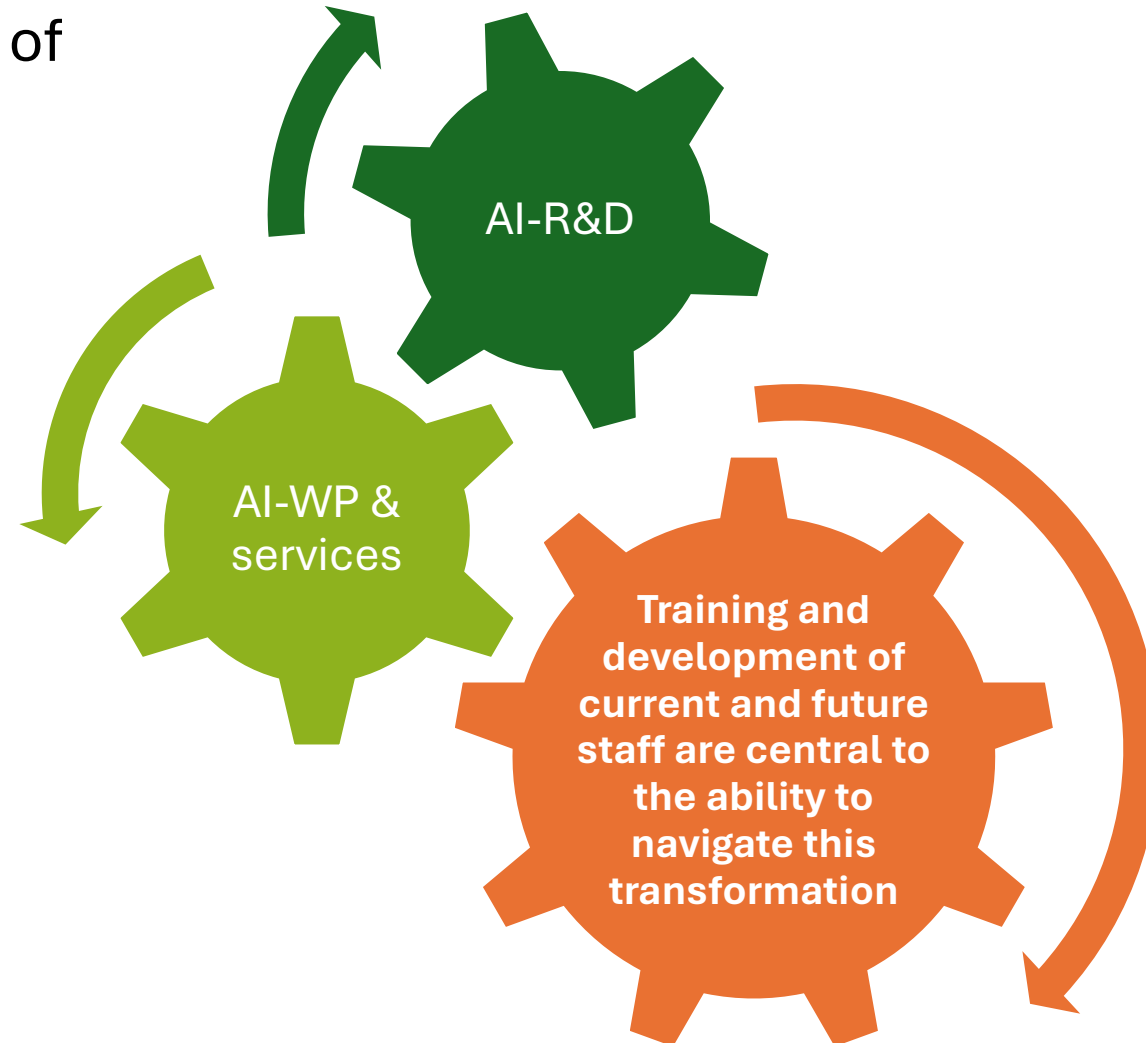


## What does it mean for capacity development?

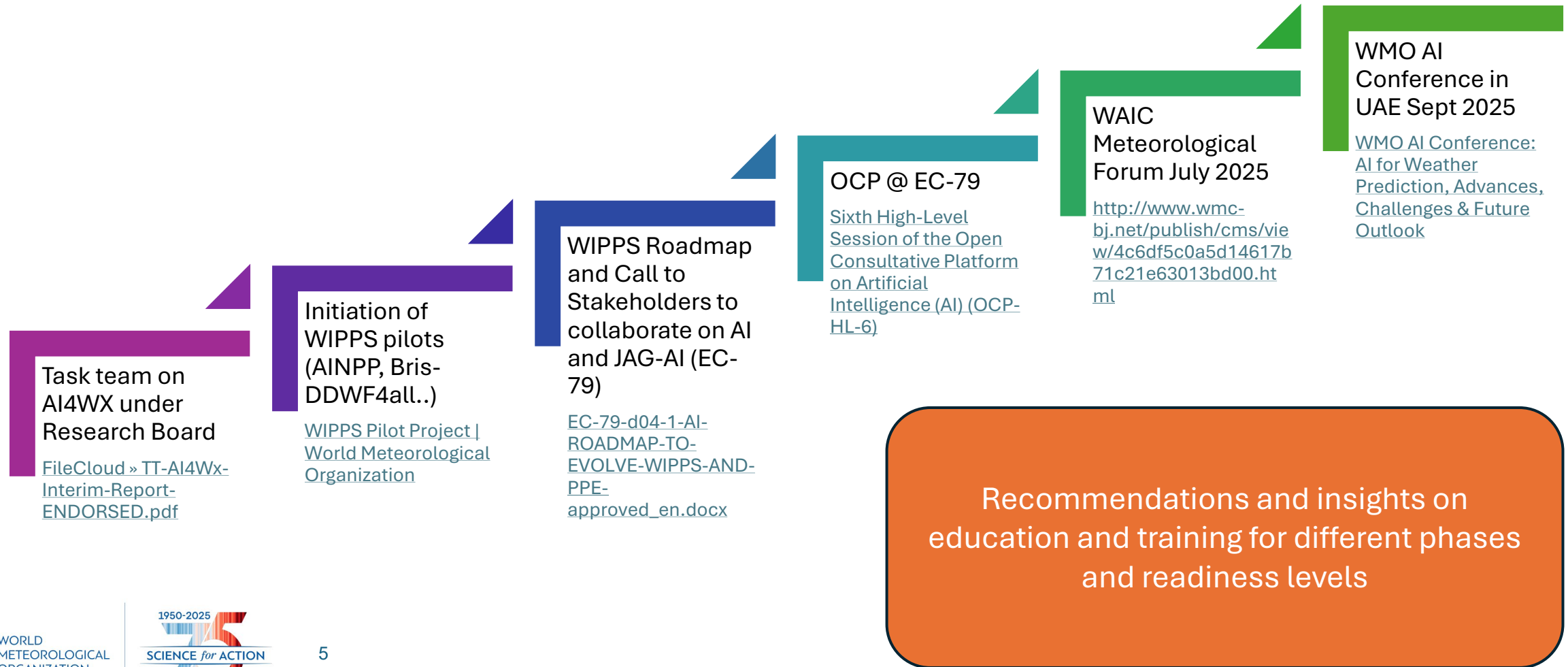
- The cost of running an AI system is computationally inexpensive
- The quality of the forecasts for a growing number of weather variables is matching those from physic-based NWP systems, with some caveats.
- If validated, opening the potential for larger level of autonomy in weather prediction and early warning for a number of national centres

# Workforce transformation : a pillar of change

Constant regardless of the size  
and level of resources of  
NMHSs:



# Supporting NMHSs through transformation



# TT- AI4WX recommendations for the workforce

The rapid advent of the era of competitive AIWP models and the ongoing pace of development in the field have left many research and government institutions falling behind in terms of workforce skills and capability with the required technologies and underpinning knowledge.

## Training programs for new staff and new curricula for students

Online tutorials on AI tools and infrastructure for varied levels of experience and use

Training developed with private companies and weather/climate prediction centers

Flexibility to enrol in courses at other institutions in subjects which fill gaps in existing curricula

Training on communication techniques that use AI, such as language translation and situational awareness

Ethics training regarding the potential biases and inequities introduced by AI

## Enabling an existing workforce: Training program +

Technical skills in pre-developed AI model implementation and running

Interpretation of AI-based model outputs, value-add services, user requirements, etc

Experience in the collection of societal data that feeds AI-based decision models

Legal and ethical aspects of AI (biases, quality, transparency, etc.)

Mentorship programs pairing AI experts with domain scientists

## For organizations who are running or developing AI models fully “in-house”

Expertise in computer science, AI development, software architecture and development

Expertise in IT architecture and operations (HPCs, GPU clusters, data storage and access maximizing data mobility, cloud computing)

Data curation to ensure that AI and ML applications are built on high-quality, well-documented, and reproducible data

# WMO AI conference in UAE – Steps to AI capacity building



## Break-out session on democratising benefits for LMIC:

- Sub-group on capacity development and skills

**Multiple expressions of interest from regional and national centres in Africa to contribute actively to effort.**



## Opportunities

- There is a plethora of existing training material: Existing training material should be aggregated, curated and publicized
- WMO should develop AI training in partnership with partners, regional centres and local universities
- Successes should be developed into use cases
- WMO-certified courses should be provided in cooperation with the private sector and academia
- WMO should direct some of its scholarships towards AI
- Existing peer-support arrangements can be built upon to include AI projects



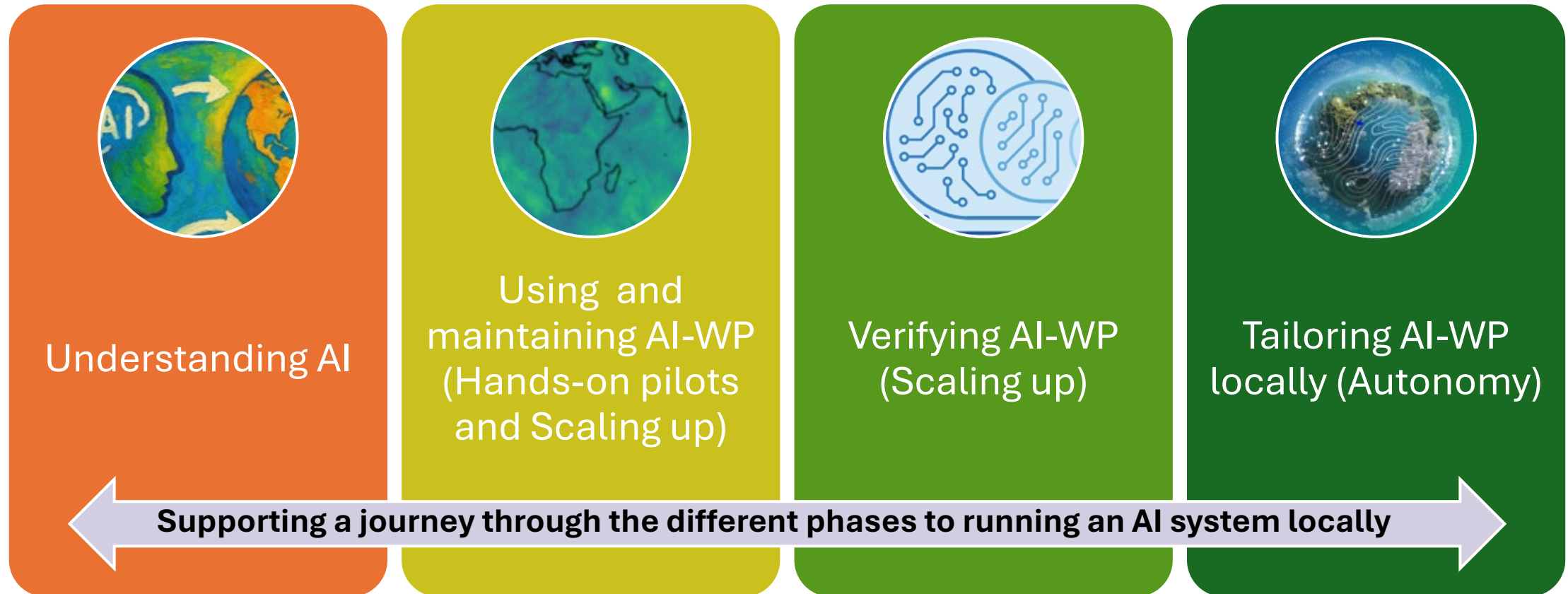
## Challenges

- Small services find it difficult to free resources for training courses
- There is a lack of local data available to be incorporated into local pilots or training
- Difficult to put training into practice after completion, risking losing their skills
- Partners (private, academia, development) lack understanding of local challenges



# Building the workforce support to AI-WP capacity building

Possible framework to articulate training and capacity development, based on pilot to ops and heterogeneity in LMCIs, with coordination of regional and national structures for further design and delivery.





# Proposed actions for strengthening AI-related Capacity Development

- Including AI capacity development as a standing agenda item of the CDP to ensure consistent oversight and guidance
- Assess and monitor Members' needs systematically to analyse the evolving needs of regarding infrastructure, services, and human capacity
- Establish a WMO-wide strategy and implementation framework for AI-related education, training, and skill development to guide Members and training partners
- Update WMO's competency frameworks to align with the readiness levels and maturity of AI applications
- Curate and facilitate access to high-quality training by maintaining a centralized repository of mature training resources offered by Members, partner institutions and private sector
- CDP to regularly advise EC or JAG-AI on AI-related capacity development challenges, opportunities and resource prioritization



# Thank you.



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