EPESC-Leader Joint Workshop, Busan, 15-18 July 2025

Beyond the EPESC-Leader workshop: Towards best-practice examples, lessons learnt, recommendations and papers…

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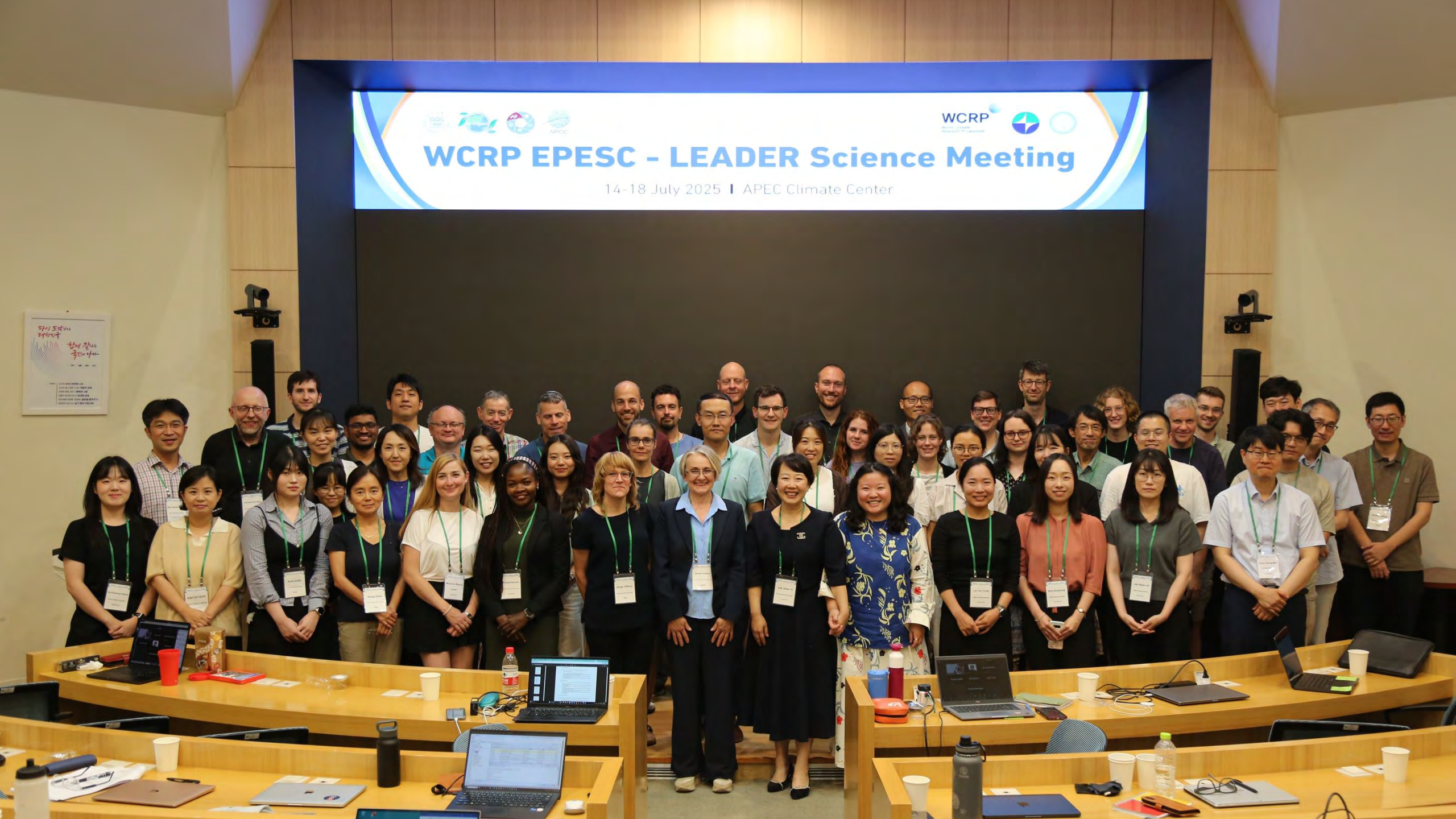
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Addressing challenges in observational products

Challenge: Observations, observation-based products, and reanalyses are uncertain, may have systematic errors and gaps

Potential ways forward:

➔ Highlight best-practice example: observational large ensemble for ocean heat/temperature or use of reanalyses ensembles

➔ Demonstrate how we can learn from reanalysis increments

➔ Highlight importance of continuing observing systems under risk from defunding,
-> Consider commentary/perspective pieces

Challenges in forcing data sets

Challenge: Forcing data sets are not up-to-date, are uncertain, and can contribute to model mismatch

Potential ways forward:

➔ Support/endorse regular CMIP7 forcing update activities

➔ Highlight good-practice examples: Studies accounting for forcing differences between CMIP5, CMIP6, and CMIP7 forcing

➔ Regularly update forcing data sets to confront models with the most recent years

➔ Moving towards “perturbed forcing” ensembles

Challenges in interpreting model response

Challenge: Model response may be too small/wrong – learning from signal-to-noise paradox

Potential ways forward:

➔ Illustrative examples highlight the challenge: NAO signal-to-noise paradox (predictability time scales) + underestimated long-term trend (multi-decadal time scales)

➔ Best-practice examples how to identify the “true forced response”

➔ Recommendation: Do not interpret models at face value without evaluation

➔ Recommendation: Understanding the physical mechanisms is key

➔ Perspective highlight: reality may be worse than predicted

Challenges in interpreting single-forcing ensembles

Challenge: Dynamic response to different forcings tends not to be linearly additive

Potential ways forward:

➔Best practice example: how to interpret LESFMIP in the presence of model uncertianties

➔Compare signals across different models, regions, and illustrate examples of non-additivity

➔Encourage more (use of) Tier2 LESFMIP runs

➔Discuss implications for warming level approaches, emulators, overshoot scenarios etc.

Challenges in event attribution – unseen approaches

Challenge: Numerous approaches to event attribution exist but models and their response are often insufficiently evaluated

Ways forward:

➔Method intercomparison projects for a common definition of event and counterfactual

➔Best-practice guidance for evaluation of models and predictability

➔Highlight that confidence is based on process understanding

➔Highlight the importance of accounting for potential dynamical response

➔Highlight challenges and opportunities when moving towards operational event attribution


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