

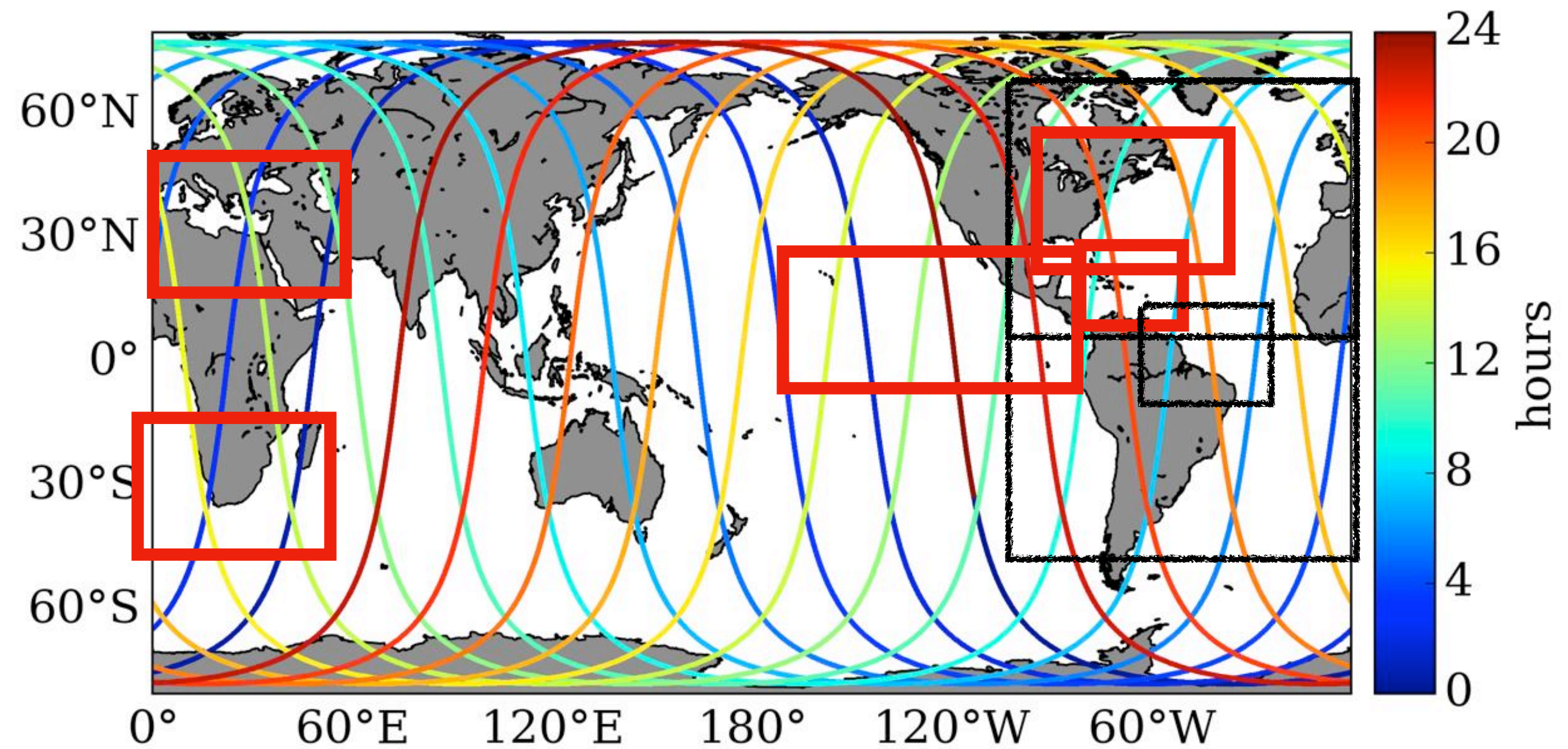
HR models and AdAC campaigns

Contributions from WG2

**Brian Arbic, Patrice Klein,
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Latest advances in modeling crossovers regions

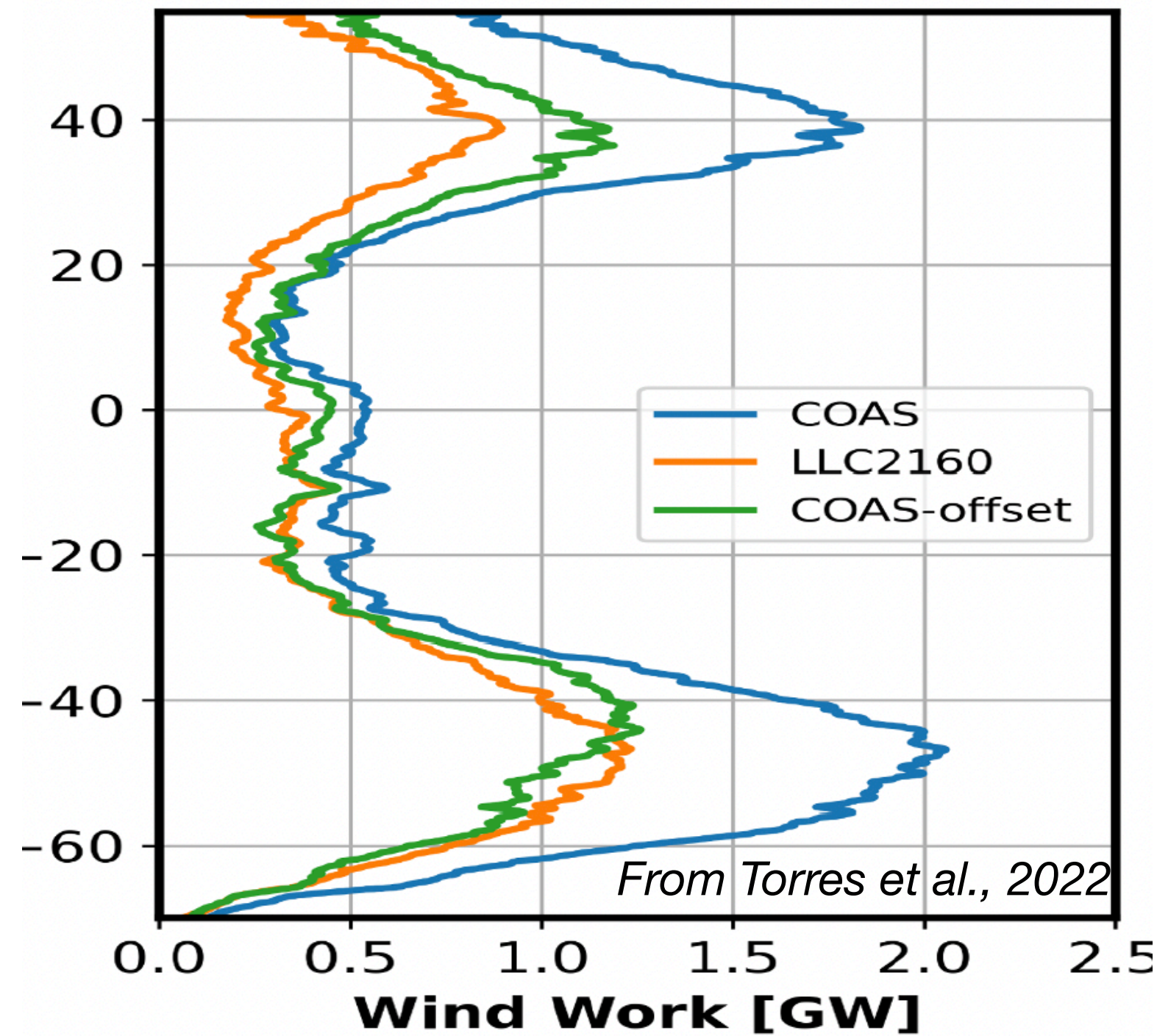
- Basin to global scale km models with extractions at SWOT crossovers
- Developments in hi-res tidal models, in particular for boundary forcings
- New coupled km scale ocean-atmosphere : regional and large-scale
- Ensemble simulations describing the range of states compatible with obs
- Full regional prediction systems with data assimilation (few)
- Progress in developing hydrodynamically based internal tide correction models



Some example of kilometric forced models (black) and coupled models (red)

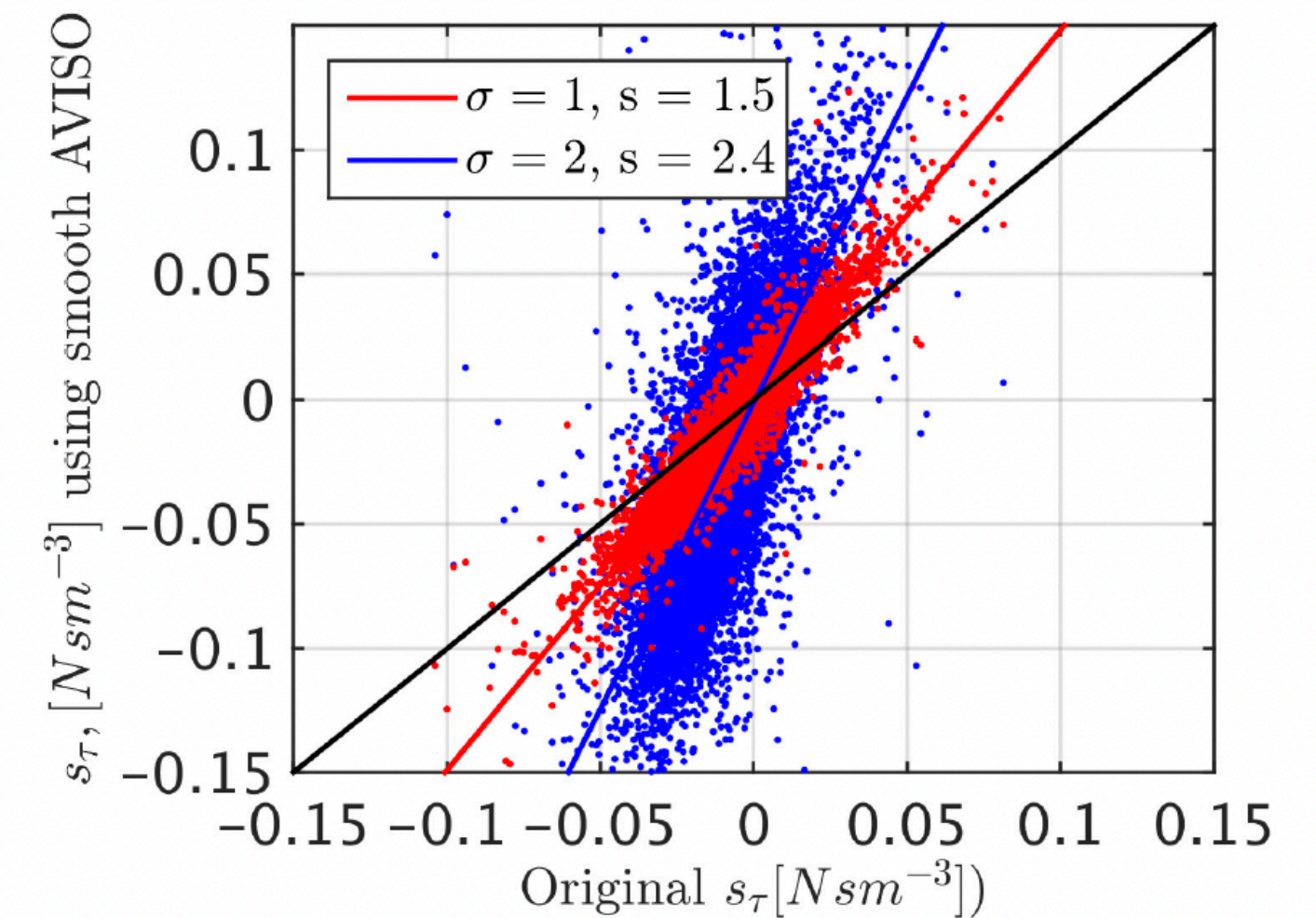
- Robust tools for drawing pseudo-observations from these models
- Emerging machine learning models for forecasting surface fields

Specific in-situ data useful to WG2 activities



Here an offset of 12 hours cause a reduction of the total wind work by 2 (mainly **high-frequency** windwork)

AVISO and QuikSCAT suffer from incoherency. Here **the mesoscale** coupling coefficient between surface current and stress \rightarrow large uncertainties



Renault et al., 2017

- ▶ Need for colocalized measurement of currents, winds, in order to build physically coherent description of the physical scenes.
- ▶ Need for estimates of statistical descriptors of macro-turbulence for assessing models beyond the SWOT-ST (cf CLIVAR OMDP)
- ▶ Need to think about how to share and distribute in-situ data for maximizing their uptake by modeling groups (ex : cloud, catalogues...)

Possible tools and contributions to AdAC campaigns

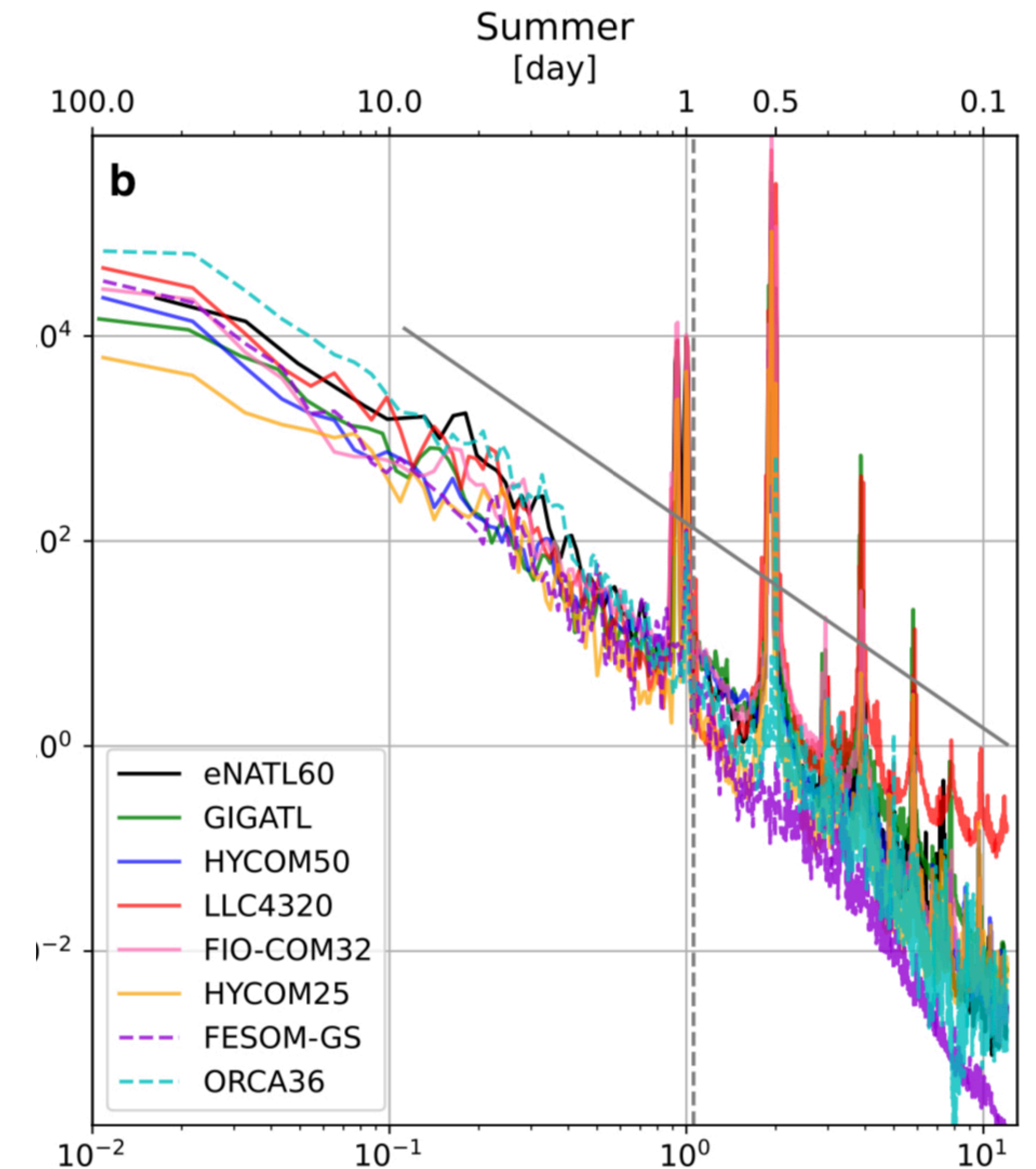
Possible contributions

(increasing complexity/needed resources)

- Provide fields from different models (inc. coupled models) on the cloud ?
- Provide tools to generate pseudo obs and pseudo SWOT data from them
- Provide tools to generate gridded product from pseudo-observations

Open questions:

- are there specific needs for setting up regional forecasting models for planning campaigns ?
- Would lightweight (machine learning) based forecasting models be useful for planning the campaigns ?



Uchida et al. (2022) : cloud-based workflows