Environnement Canada Environment Canada

Canada

Ensemble wave forecasting at CMC

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from *Syd Peel and Roop Lalbeharry work, MRD/MSC*

Current prototype configuration - Global

- Based on WAM 4.5 forced by CMC global EPS winds (every 3h then 6h)
- latitudinal extent : 72◦ S - 72◦ N
- spatial resolution : 0.9◦
- forecasts every 3 h out to 240 h
- propagation timestep: 20 mins
- integration timestep: 20 mins
- 96 processors/6 nodes
- 4-6 mins/member => wall clock: 6300 s
- -> boundary conditions for north Atlantic and Pacific nested window

Current configuration - Atlantic Canada

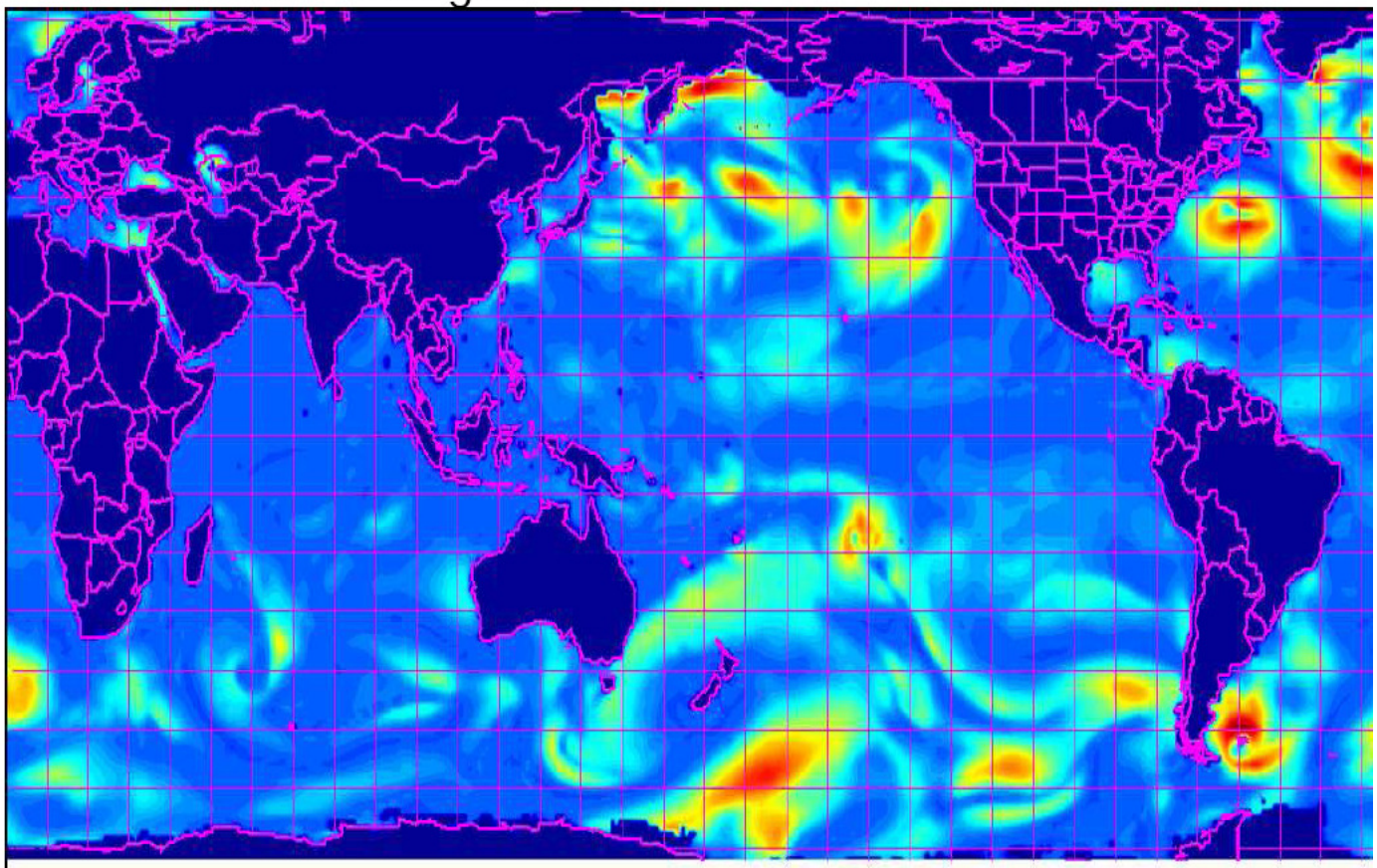
- latitudinal extent : 40◦ N - 52◦ N
- longitudinal extent : 75◦ W - 46◦ W
- spatial resolution : 0.1◦ (wind interpolated from global)
- forecasts every 3 h out to 240 h
- propagation timestep: 4 mins
- integration timestep: 12 mins
- 64 processors/4 nodes
- 5 mins/member => wall clock: 6300 s

Hindcast

- A hindcast was made and results are currently analysed.
- This is running every day since then on an experimental mode.

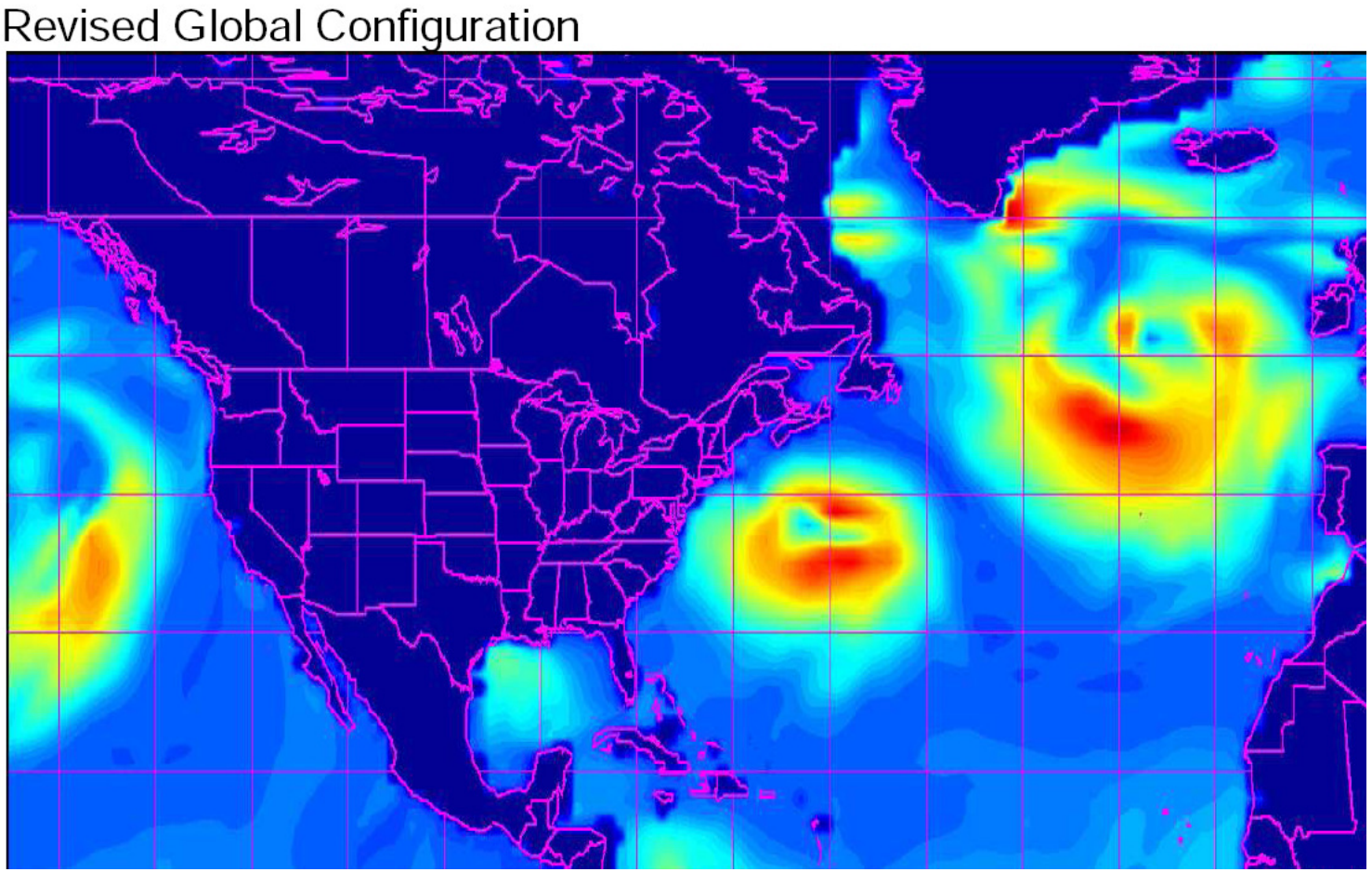
Example from one member: forecast of significant wave height

Revised Global Configuration



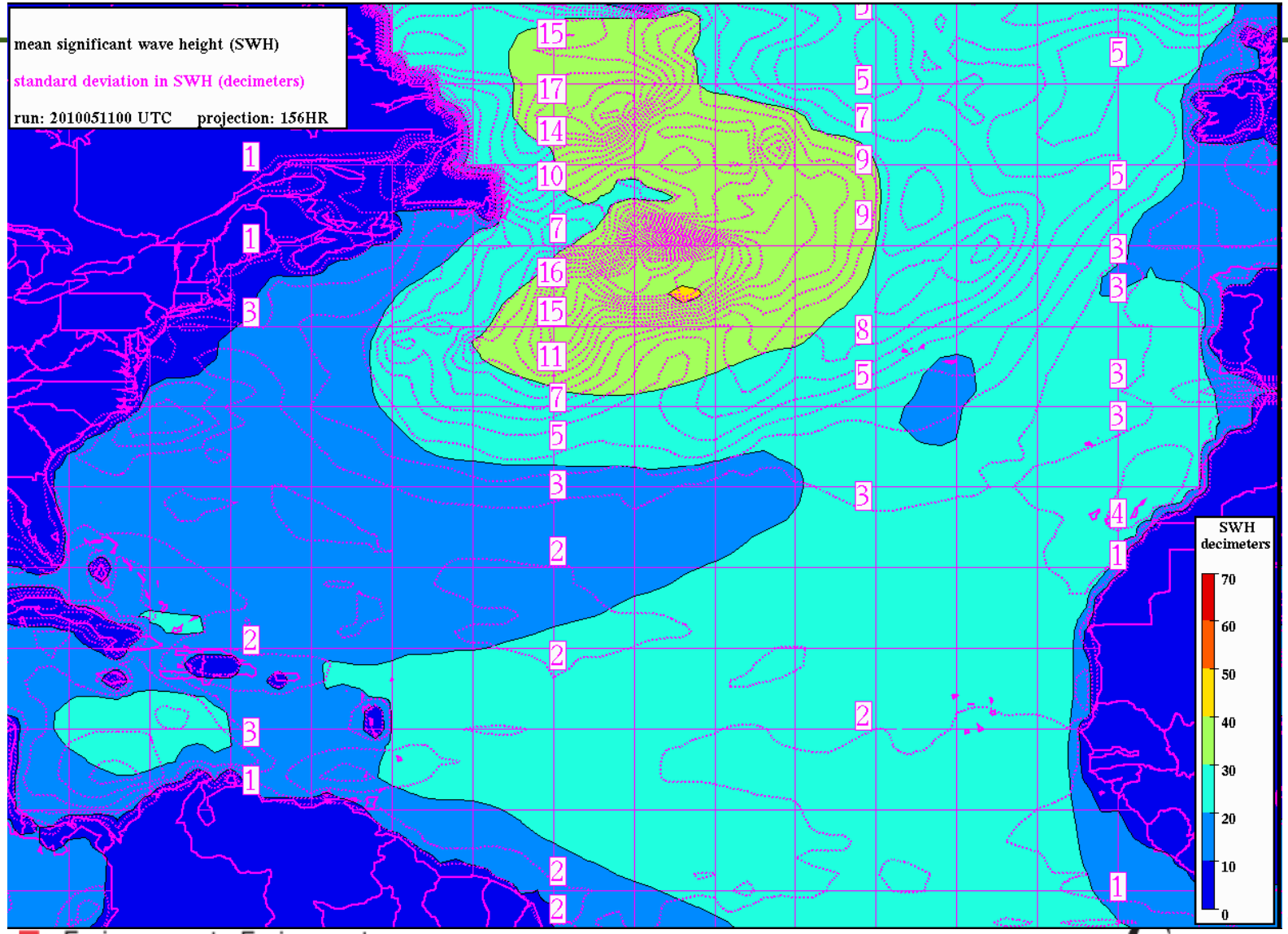
Resolution = 0.9º

Example from one member: forecast of significant wave height (zoom)

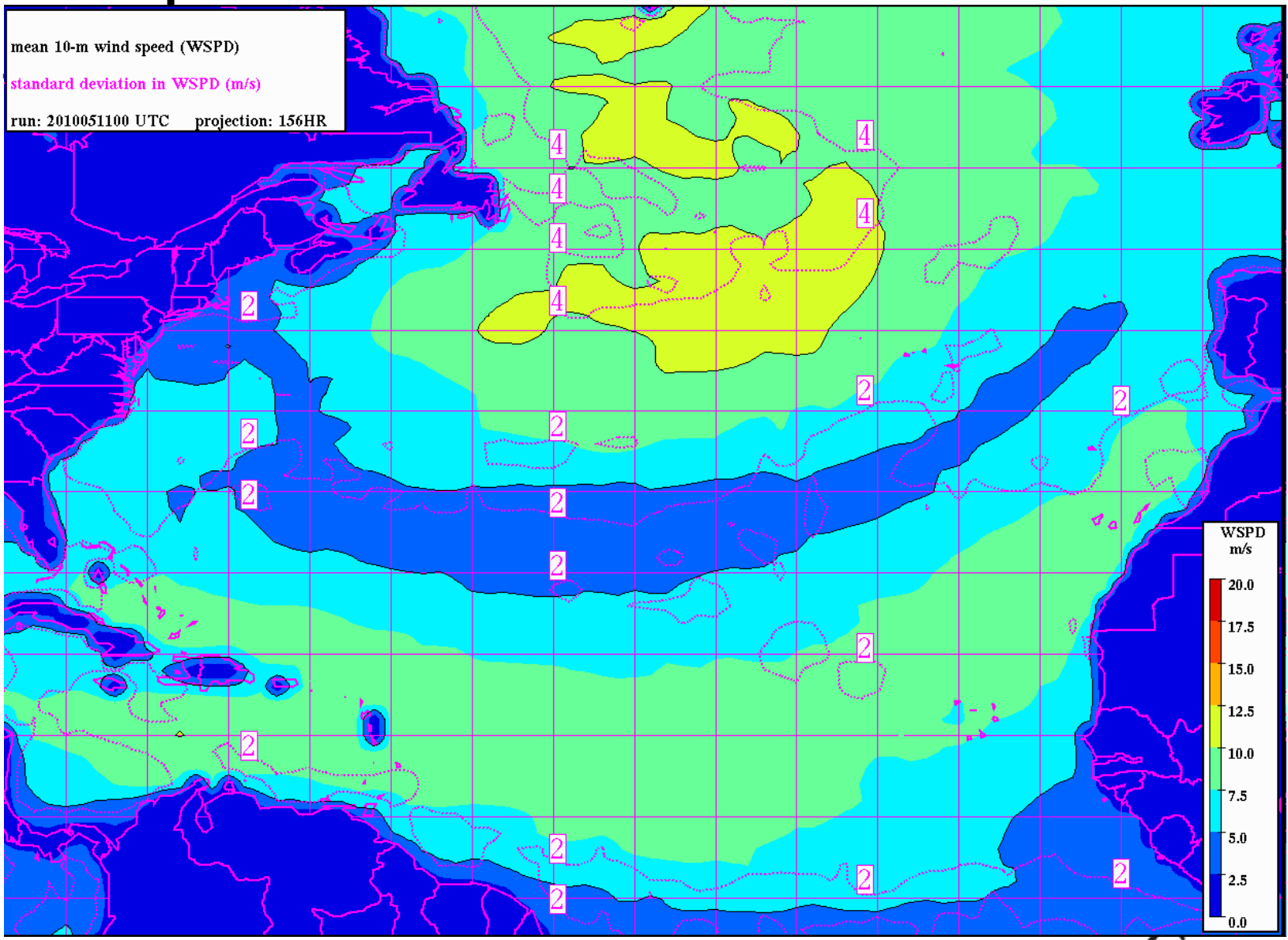


Resolution = 0.9º

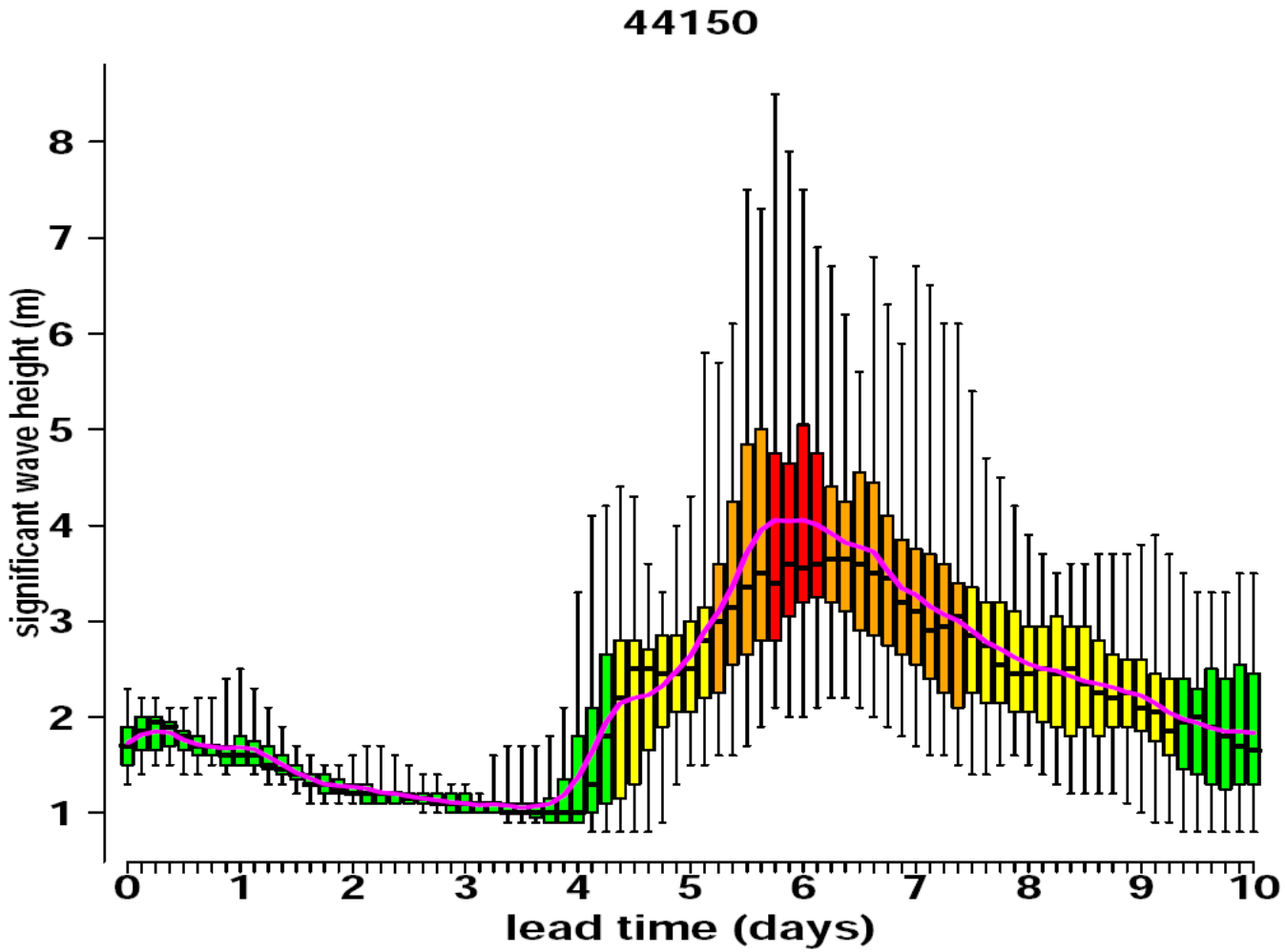
Example: means and standard deviation chart of significant wave height http://whxlab.dart.ns.ec.gc.ca/~wave/wam_ensemble/



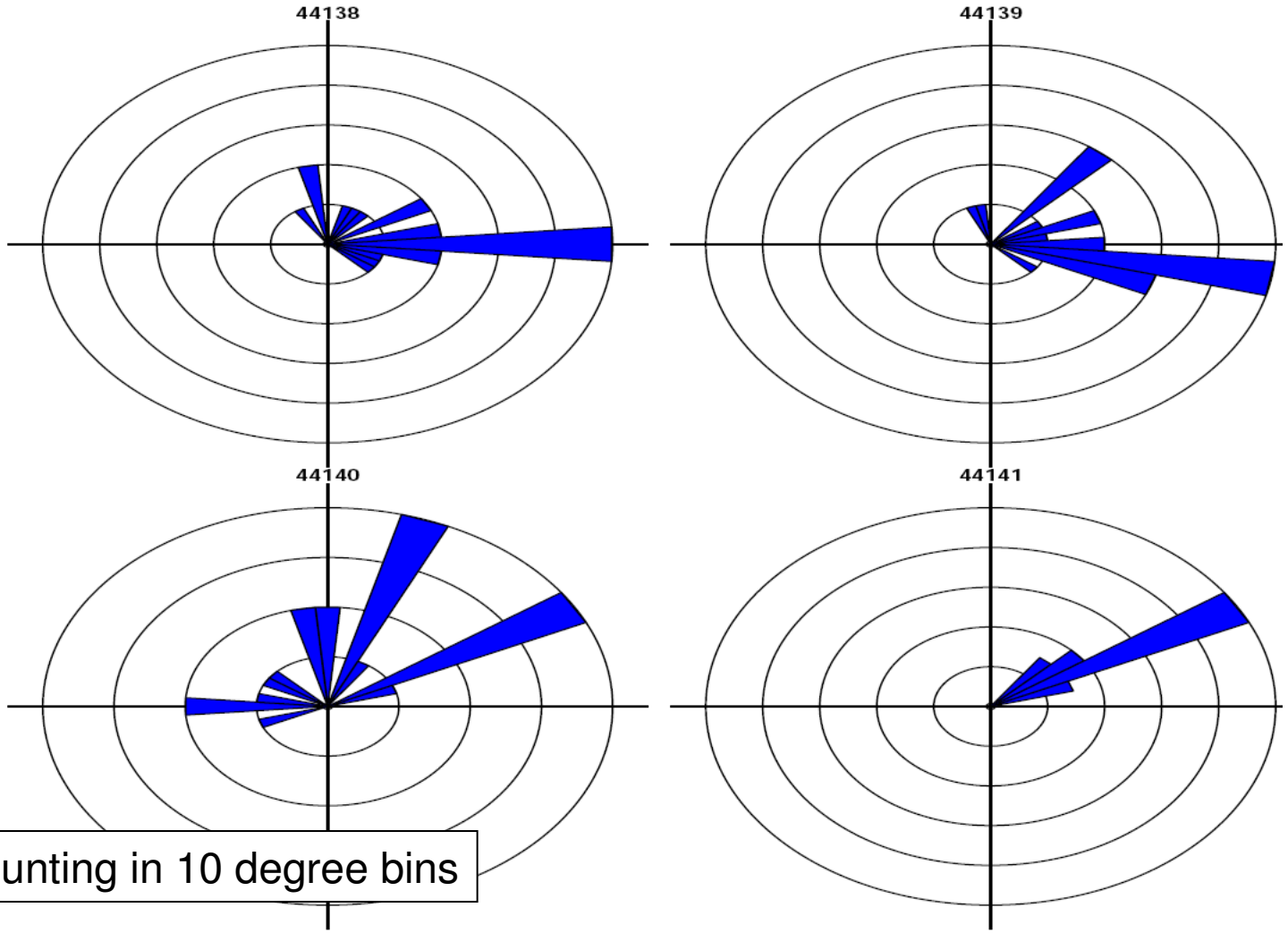
Example: means and standard deviation chart 10m wind speed



Example of time series at one site



Example of surface wind roses at buoys in North Atlantic



Member counting in 10 degree bins

Plan regarding NAEFS

- Inclusion of wave information in the NAEFS exchange?
- Each centers NCEP, FNMOC and CMC would share 20 wave forecast member's output leading to a set of 60 ?
- What would be the number of members beyond which no value be added ?