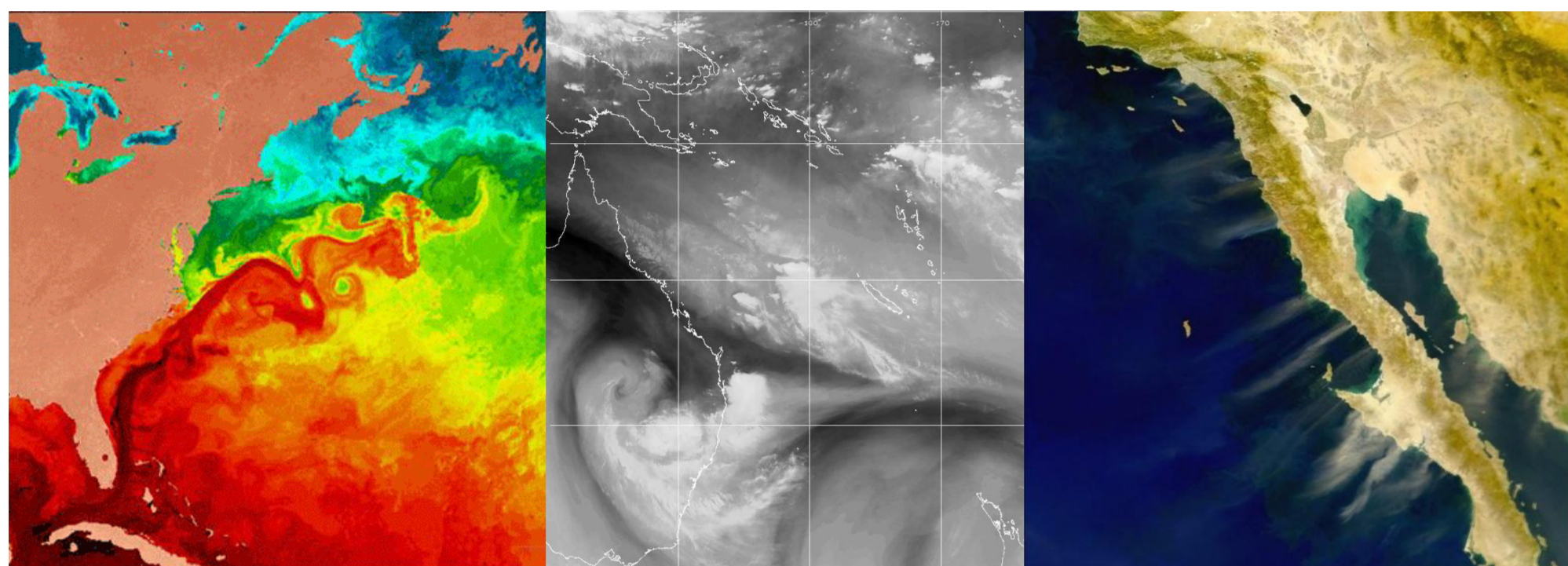


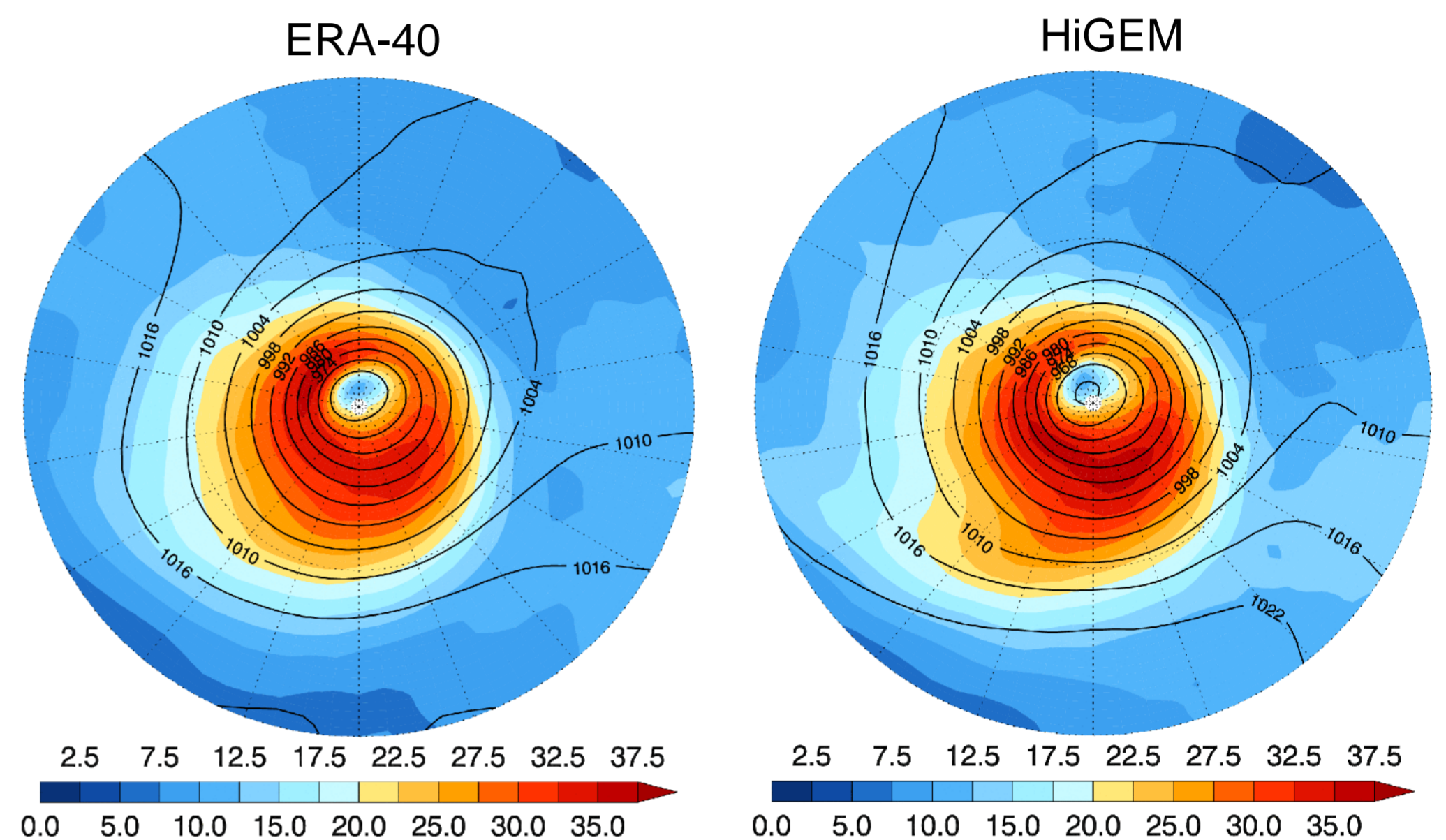
Len Shaffrey, Pier Luigi Vidale, Marie-Estelle Demory, Jen Catto, Jane Strachan
NCAS-Climate, University of Reading

The impact of resolution on climate prediction

- To inform adaptation to climate change, we need climate predictions at regional scales for the next few decades.
- Will increasing the resolution of coupled climate models improve the representation of regional climate and weather?



The representation of weather systems in climate models

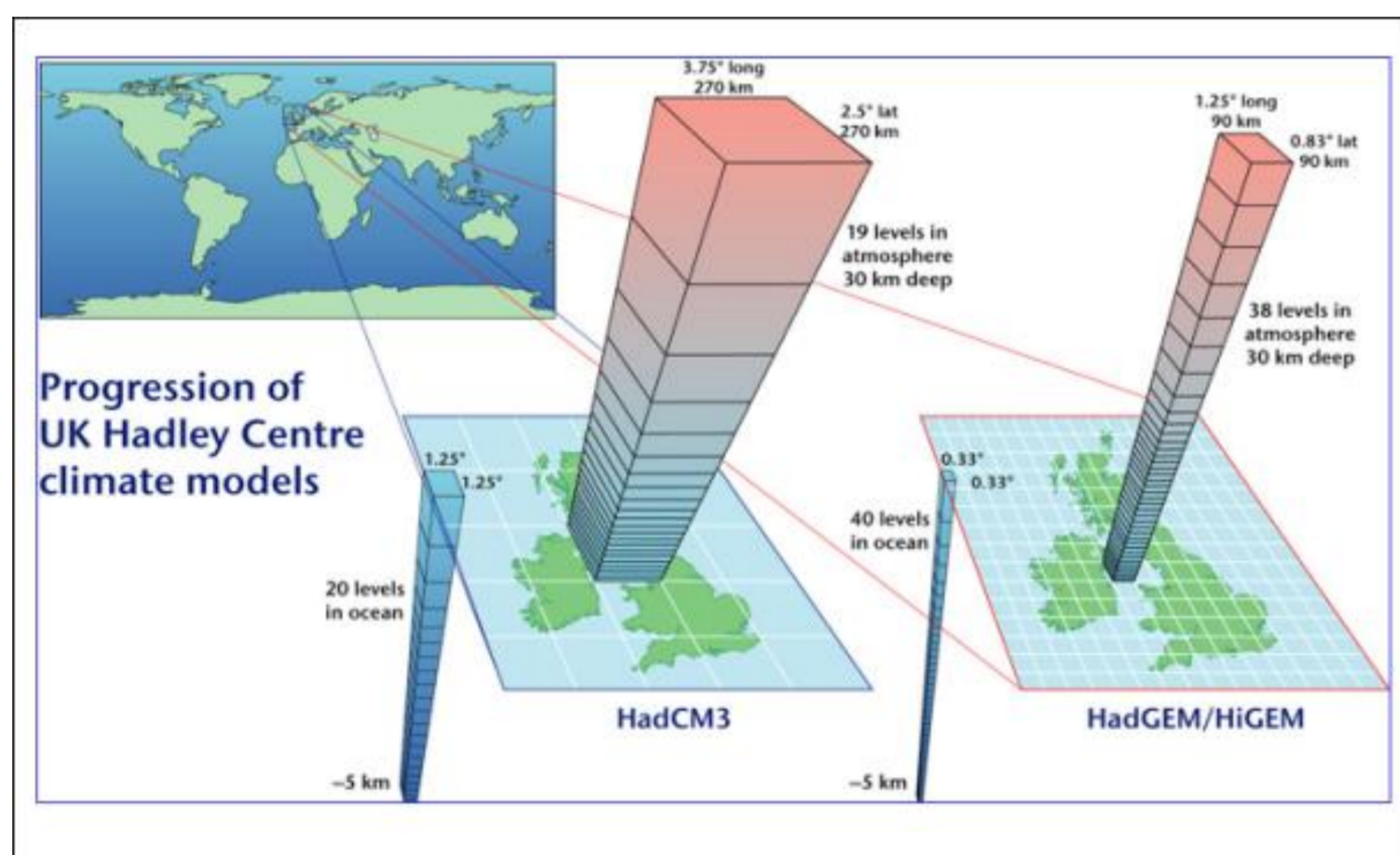


If we are to have confidence in the ability of coupled climate models to predict regional climate and extremes, it is essential that they can faithfully represent weather systems.

The figures above show the composite structure (windspeed in colour, Mean Sea Level Pressure in contours) of the 50 most extreme NH extratropical cyclones from observations (ERA-40, left) and HiGEM (right). HiGEM is capable of capturing the spatial structure of these intense storms.

HiGEM: A higher resolution coupled climate model

HiGEM is a high horizontal resolution version of the Met Office Hadley Centre climate model, HadGEM1.

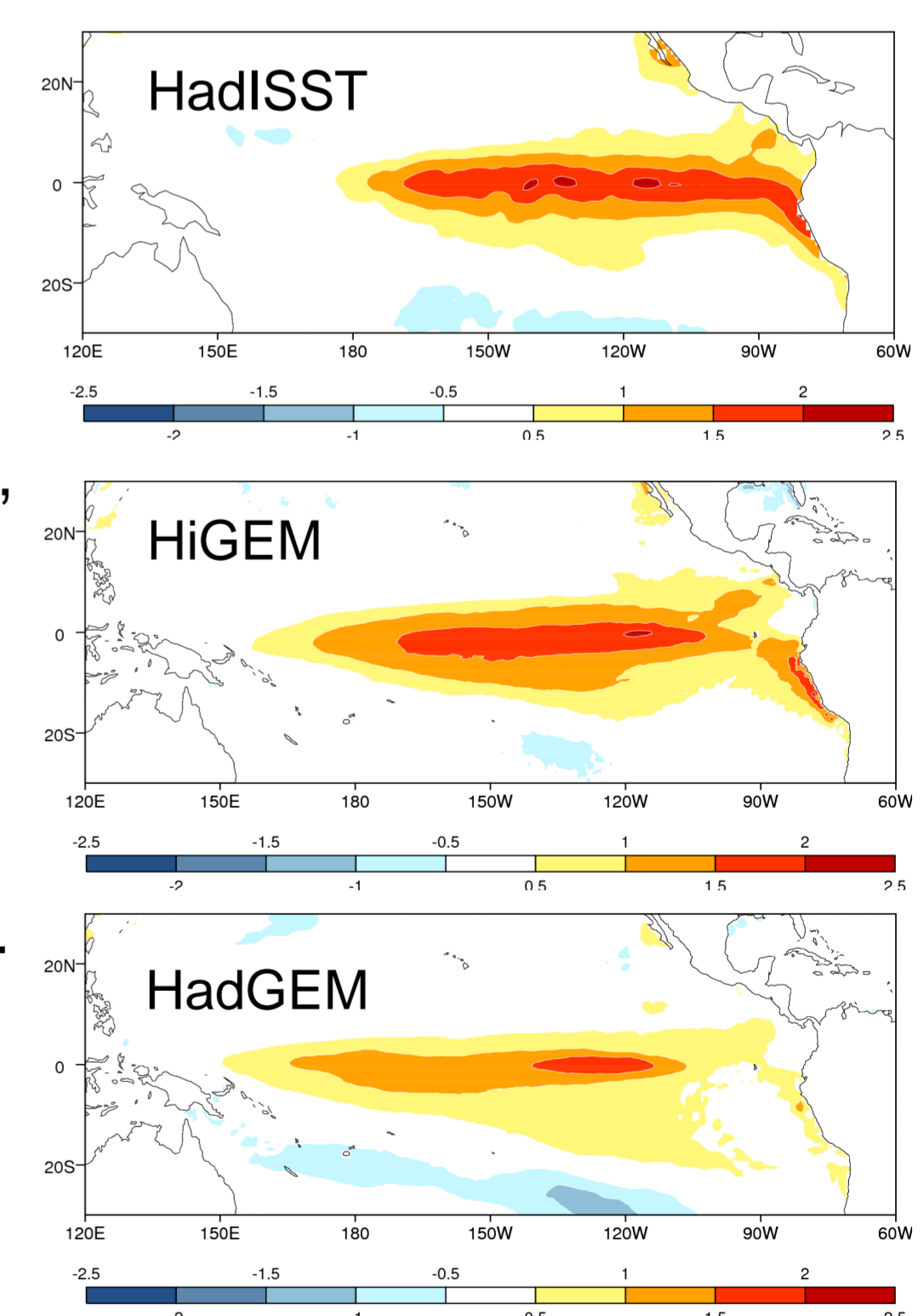


In the atmosphere, the horizontal resolution has been increased to 1.25° longitude by 0.83° latitude. In the ocean, the horizontal resolution has been increased to 1/3°x1/3° globally, an eddy permitting ocean resolution. There are 38 levels in the atmosphere and 40 levels in the ocean. For more details see Shaffrey et al. (2009), *J. Clim.*, 22, 1861-1896.

An even higher resolution atmospheric model, NuGAM, has also been developed.

The impact of resolution on climate and climate variability

Increasing the resolution dramatically improves the representation of El Niño. The figures on the right show the DJF composite sea surface temperatures for El Niño years, from observations, HiGEM and the lower resolution model HadGEM. The improvement arises since HiGEM can resolve oceanic tropical instability waves (Roberts et al. 2009, *J. Clim.*, in press).



Find out more...

Contact: **Pier Luigi Vidale**, p.l.vidale@reading.ac.uk
<http://www.higem.nerc.ac.uk/>