



Recent developments seasonal forecasting at the Met Office

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GloSea3

- Based on old version of climate model (HADCM3)
 - Break in chain between NWP, THORPEX and climate
 - Loss of advantages for model development (neither helps learn about growth of errors, nor gains from developments made in other configurations)
- Run 1st of month, with ensemble from perturbing SSTs and stresses around best guess

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GloSea4 prototype: Initialization

Forecast:

- *Atmosphere, land surface*: reconfiguration of NWP analyses
- *Ocean*: Data Assimilation based on Optimal Interpolation using NEMO-ORCA1L42. Daily cycle. Externally forced by NWP fluxes it assimilates satellite and in-situ ocean SST and ocean temperature and salinity profiles from the MetDB.

Hindcast :

- *Atmosphere, land surface*: reconfiguration of ERA-Interim reanalysis products (ERA-Interim anomalies + model climatology for soil moisture)..
- *Ocean*: ODA equivalent to forecast but run off-line. Daily cycle. Externally forced by ERA-interim fluxes it assimilates ocean SST from Pathfinder (satellite); ICOADS SST (in-situ); and subsurface data (EN3).

Alberto Arribas + team

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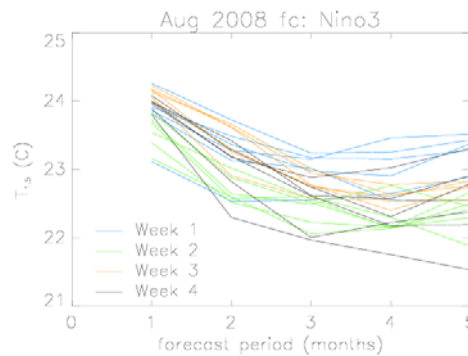
GloSea4 prototype:

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ICs: *Lagged approach* / **Model:** *Stochastic Physics (RP and SKEBv1.0)*

Resolution: *N96L38 – ORCA1L42*

Note: All members run in a particular week share the same IC and differ only because of stoch. Phys.



Hindcasts run in real time (so can update model more easily)

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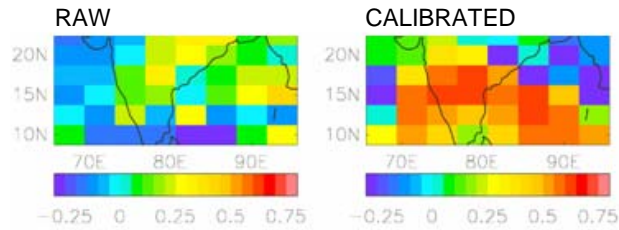


Post-processing

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Post-processing: Improved calibration

ACC of ensemble mean for precipitation



- Substantial potential to improve skill. Length of hindcast required currently under investigation
- Also work on spatial and temporal aggregation

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GloSea4. Recommendations for operational implementation

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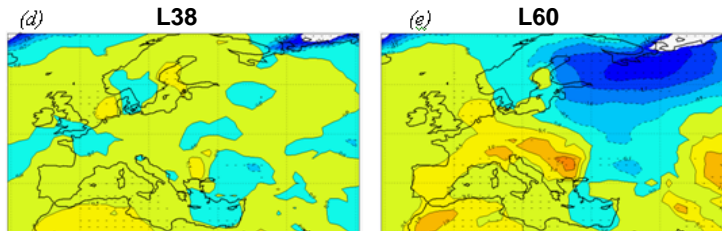
	Summer 2009	Future upgrade
System configuration	Fcst: 30 members Hcst: 15-yr (most recent years from ERA-Interim); 10 members	Fcst: 30 members Hcst: 20-yr; 10 members [cost incr.: x 1.3]
Model configuration and resolution	HadGEM3 N96L38+ORCA1L42	HadGEM3 N96L60+ORCA1L42 [cost incr.: x 1.6 (with same timestep)]
Initialization	Atmosphere: reconfiguration of NWP / ERA Ocean: DA: fix problems and improved covariances; improved mixing schemes [TKE] Sea-ice: Include assimilation	Coupled initialization as described in Anderson et al. (2008). Replacement of NEMO-OI by NEMOVAR
Representation of uncertainties	ICs: lagged approach Model:RP + SKEB2	Improvement of SKEB2
Post-processing	- GloSea3 calibration and display system - New calibration methods - Complete MO-EPS Integrated web display system	- Improvement of new calibration methods - Improvement of integrated display system
Computing cost	~1.5%	~3%

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GloSea4. Future resolution

Composites Nino-Nina. 1.5 m temp. (Figure by A. Marshall)



- European response to ENSO (negative NAO) better in L60.
- **Subject to cost and testing in seasonal suite move to resolve stratosphere**
- **Plan to develop N216 research system in collaboration with Korea/NERC but not operational implementation (yet) because of cost.**

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