ICAP-Multi Model Ensemble Preliminary Analysis











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Experience has shown that ensembles of independent models tend to outperform their members for events forecasting and climatological baselines provided: •Models are independent •Model errors are similar •No weighting!

An ensemble is a good way to gauge how well the community is doing and where problem areas exist.





- NRL is warehousing all the world's global aerosol forecast data to feed the ICAP multi-model ensemble. UKMO is hopefully coming soon.
- While July 2011-Dec 2012 is our focus, we are still collecting data.
- Thanks to Hogan and Mclay we have a much more contiguous NOGAPS ensemble.

NIASA also has rerup for the MME



Typical products







ICAP Multi-model ensemble: How do models compare on average?





- Often large differences between individual events.
- Most models underestimate dust/smoke and overestimate sea salt AOT.
- Large differences between species in heterogeneous environments.
- Tendencies to tune the climatological averages and the MME mean.



^{0.16} 0.04 0.64 1.28 Dointwice AOT Maximum and Minimum (EEO nm)

The first 24 hours: All models underestimate AOT





Biases in Time



Sahelian Africa, India and Southeast Asia are the three big trouble spots.

As a fractional bias, marine environment is also problematic.









Other Uses Example: November 29 2012 Dust AOT: 72 hour forecast of eNAAPS

Monday 26 November 2012 00UTC Meteorological Ensemble eNAAPS-NAV Forecast t+072 Thursday 29 November 2012 00UTC Valid Time Oust 0.8 Aerosol Optical Depth at 550nm (µ in red)



Divergence in models tells us when and where to look at satellite imagery

11/27 Dust enhancement



Plots Generated Monday 3 December 2012 20UTC NRL/Monterey Aerosol Modeling NOT OFFICIAL FNMOC NAAPS RUN

Monday 26 November 2012 00UTC 1 Thursday 29 November 2012 00UTC Valid Time Dust Aerosol Optical Depth at 550nm

Monday 26 November 2012 00UTC NAAPS Forecast t+072



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Multi-Proceeding Manades - 5 Proceeding - 541 5 Store Allo Manades - Annual Manades Plats operatives Proceeding - Store Proceeding - 424 2 2 20 11, 1952 (Proceeding Activity Activity)



Ensemble products ready for the web?



eNAAPS on aerosol page



NRL Monterey NAAPS Forecast This page is an official U.S. Navy site and is intended as an internal research and development testbed. ald not be breated as operational forecasting tooks NOT OFFICIAL FINNOC NAAPS Privacy Policy Disclaimer Marine Neteorology Division (Code 7500) U. S. Navy Navy Recruiting Navy FOIA ONR Main Lating / ENAAPS RAV Ensemble East Asian Total Aerosol Ophtal Depth this i next Monday 11 March 2013 00UTC ENAAPS-NAV Forecast t+024 012 538 624 030 042 648 554 060 042 648 052 075 076 086 072 076 086 072 078 086 010 016 102 108 114 120 Tuesday 12 March 2013 00UTC Valid Time TOTAL Aerosol Optical Depth at 550nm (nMEM = 20) 00.11 dost dost unake testel tital global 254 368*E 1701

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NOT OFFICIAL FNMOC NAAPS RUN

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Plots Generated Wednesday 11 March 2013 22UTC NRU/Monteres Aerosol Modeling

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2.5

5.0

ICAP-MME on unadvertised page eNAAPS mean & deterministic, ECMWF, JMA, NASA, NOAA (dust), now BSCC-NMMB (dust), UKMO (dust coming)



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NRL Monterey NAAPS Forecast





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Sunday 10 March 2013 dBUTC XXM Forecast 1+054 Tuesday 12 March 2013 0BUTC Web Time TOTAL 5.1 Antonio Optical Depth at 550nm (universit) (INEX = 6.)



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