# **Evaluation of blended wind products and its implications for off-shore wind power estimation**

## Synopsis:

### **Conclusions:**

#### Table 1. Difference in processing between CCMP2 & CCMP3

CCMP2	CCMP3
ERA-Interim 10-m winds as background	ERA5 10-m neutral winds as backgro
N/A	Wind speed histogram adjustment t correct ERA5 bias in high winds (bein too weak)
N/A	Surface current effect included using OSCAR surface currents

#### Table 2. Comparison between CCMP2 & CCMP3 with buoy winds for all wind speed

	Buoy vs. CCMP2	Buoy vs. CCMP3
Corr Coef	0.91	0.91
STD Diff	1.36 m/s	1.32 m/s

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CCMP Version 2 (CCMP2) is generated by the Remote Sensing Systems. CCMP Version 3 (CCMP3) is being developed with a number of improvements. estimation (Fig.2 & 3). Wind power density is computed as  $E = \frac{1}{2}\rho W^3$  where W is wind speed,  $\rho$  is air density.

• CCMP3 has better agreement with the independent buoy winds (especially for higher winds) and results in generally larger wind power estimate, see Tables 2 & 3, Fig. 2. Correlation maps of estimated wind power with various climate-mode indices (Fig. 3) show regional patterns varying with climate variability. These relationships provide sources of predictability of wind power for management purpose on regional basis. They can be used to evaluate climate-model counterparts.



	Buoy vs. CCMP2	Buoy vs. CCMF
Corr Coef	0.41	0.61
STD Diff	2.78 m/s	2.54 m/s

• The Cross-Calibrated Multi-Platform (CCMP) wind analysis synthesizes satellite & buoy winds used to fill observational gaps.

CCMP2 uses ERA-Interim 10-m winds as the background to fill observational gaps. CCMP3 uses ERA5 10-m neutral winds, adjusted for estimated effect of ocean-surface currents using the OSCAR product. Because ERA5 winds have low bias in higher wind conditions, CCMP3 mitigated this by matching method (see Carl Mears' poster in this session). Also see Table 1. Here we compare CCMP2 and CCMP3 that withheld buoy winds during the analysis. We evaluate them using independent buoy wind data from 48 stations around the US (Fig.1) and discuss the implications for off-shore wind power