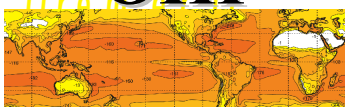
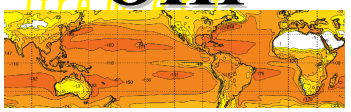


OHF : WP3 Status

Product Generation, Inter-Comparison and Uncertainty Characterizations

- WP31: Sensitivity studies and algorithm improvement
- WP32 : Use improved retrieval methods for wind speed and humidity
- WP33 : Evaluation of data sets, Error characterization
- WP34 : Ensemble generation
- WP35 : Consistency checks (“Cage Studies”)
- WP36 : Sensitivity Examinations



OHF : WP31 Status

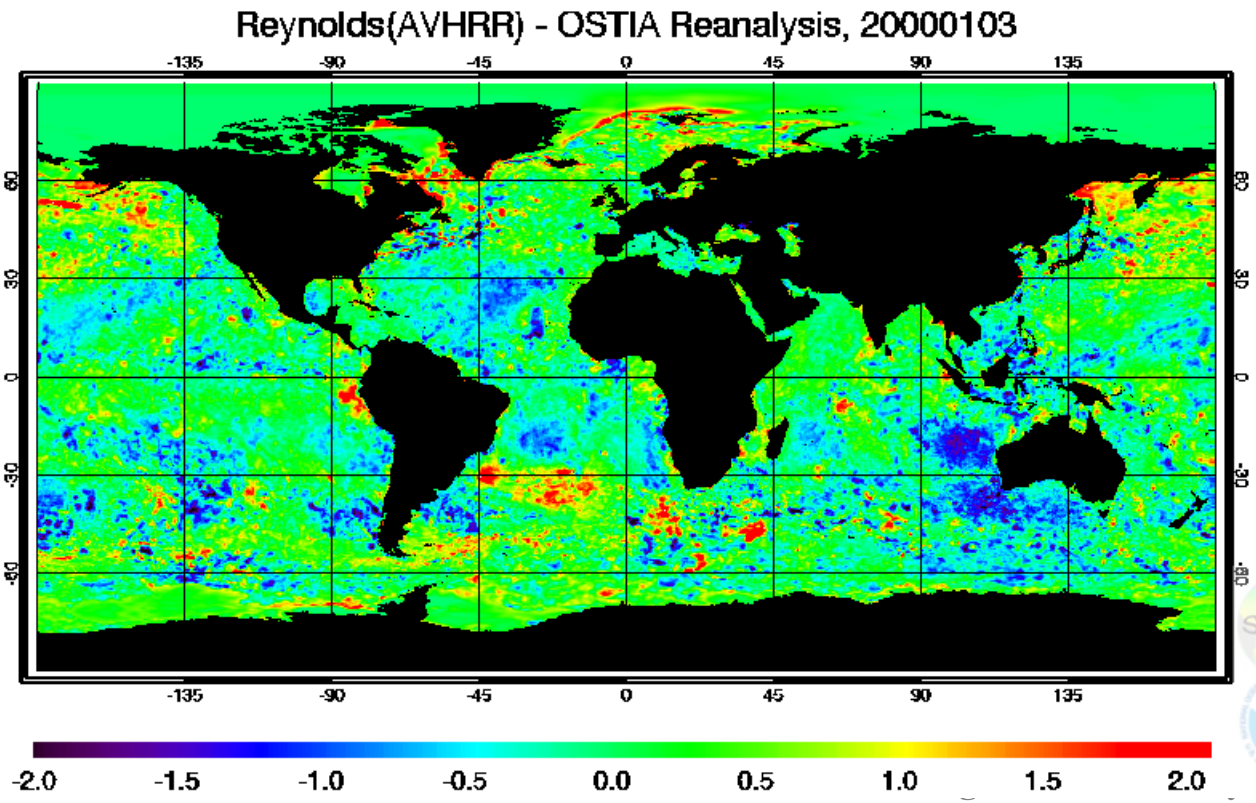
Sensitivity studies and algorithm improvement

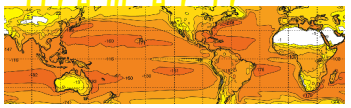
Tasks:

- **Provide** recommendation on how best to use SST CCI data in LHF and SHF flux calculation (UR)
- **Assess** impact of improved SST data (including ESA CCI sea surface temperature). Calculation of LHF and SHF based on ESA CCI SST. Calculation will be performed over global ocean at daily time scale and with a spatial resolution of 0.25° over a short period (2-3 years). (A. Bentamy – IFREMER)
- **Assess** impact of sea state on flux parameterization. Calculation of LHF and SHF based on SWH data. Calculation will be performed over global ocean at daily time scale and with a spatial resolution of 0.25° over a short period (2-3 years) (A. Bentamy – IFREMER)
- **Assess** impact of improved retrieval methods for wind speed and air humidity. Calculation of LHF and SHF based on newly processed winds and air humidity. Calculation will be performed over global ocean at daily time scale and with a spatial resolution of 0.25° over a short period (2-3 years). (A. Bentamy – IFREMER)
- **Assess** impact of improved flux parameterizations : analysis of the new bulk parameterization (e.g.Fairall et al,, 2011) impact on flux estimation over global ocean and over some specific regions such as the North Atlantic and tropical areas (A. Bentamy – IFREMER)
- **Assessment** of sensitivity of probability density functions to perturbation of inputs and different algorithms for flux computation. Quantitative estimate of sensitivity of global, regional and local energy fluxes to different types of errors, characterization of skills of generated product (local/regional/global) budgets, variability on different time scales. (S. Gulev – IORAS)
- **Generation** of a "best" turbulent fluxes time series over three years (A. Bentamy – IFREMER)

Product Generation : Sea Surface Temperature Issue

- HR SST V2 (Reynolds *et al*, 2007)
  - Sea Ice Free Global Daily-analysis / 0.25°×0.25°
- CCI SST
- Sea Ice Free Global Daily-analysis / 0.05°×0.05°





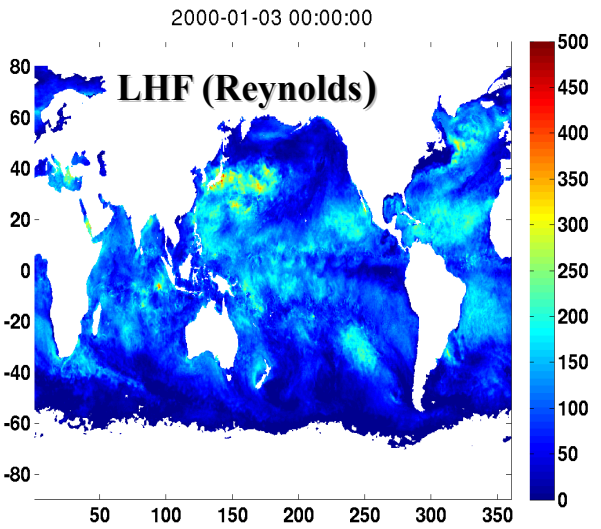
WP31.2 : impact of improved SST data

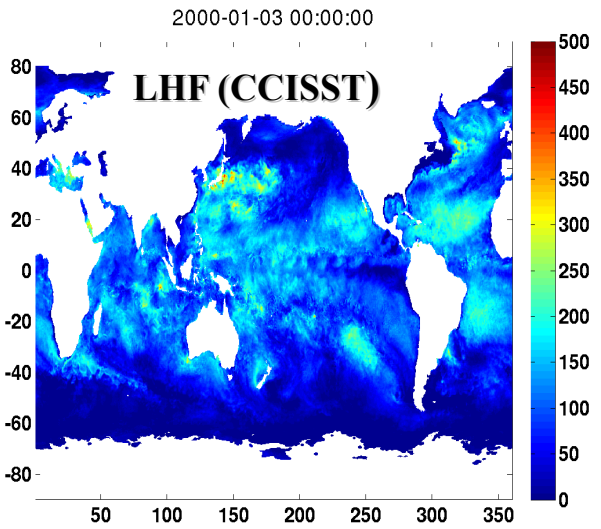
(including ESA CCI sea surface temperature).

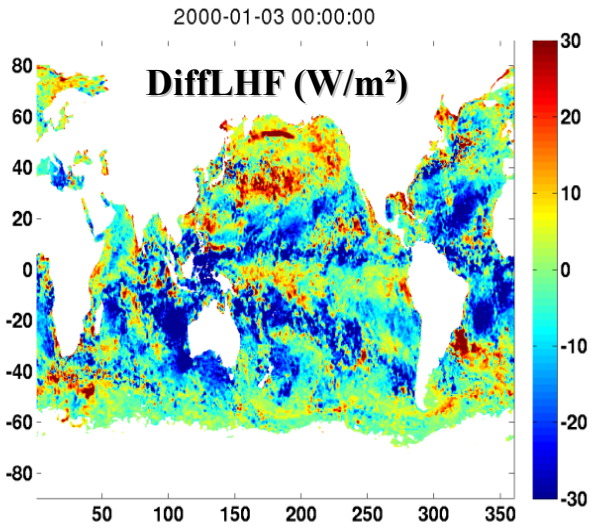
- **Wind :**
  - QuikScat retrievals (V3 (Fore *et al*, 2011)) including (Bentamy *et al*, 2012) results
- **Specific Air Humidity : New release**
- **Air Temperature:**
  - Corrected Era Interim
- **Sea Surface Temperatures**
  - HR SST V2 (Reynolds *et al*, 2007)
  - CCI SST

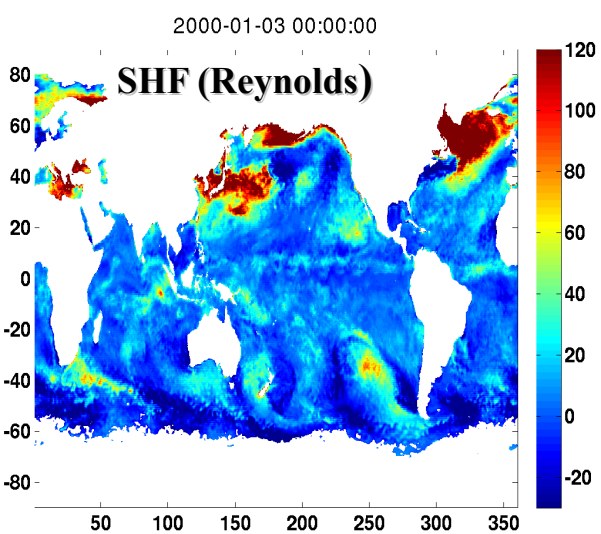
Objective Method (Bentamy *et al* , 2013) **Calculations of Global Daily 0.25°x0.25° Flux Analyses.**

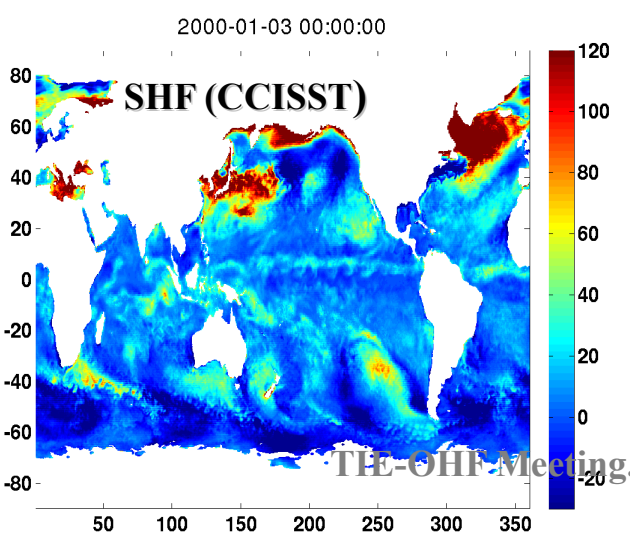
Product Generation
Examples of 03 January 2000

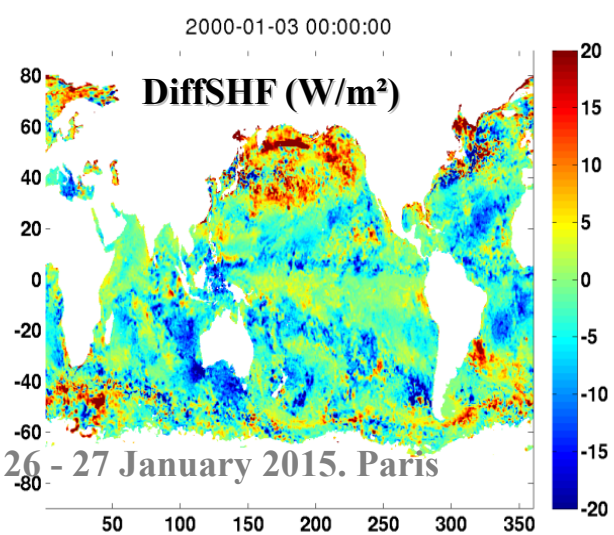


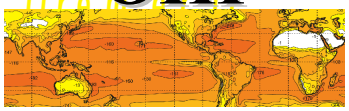




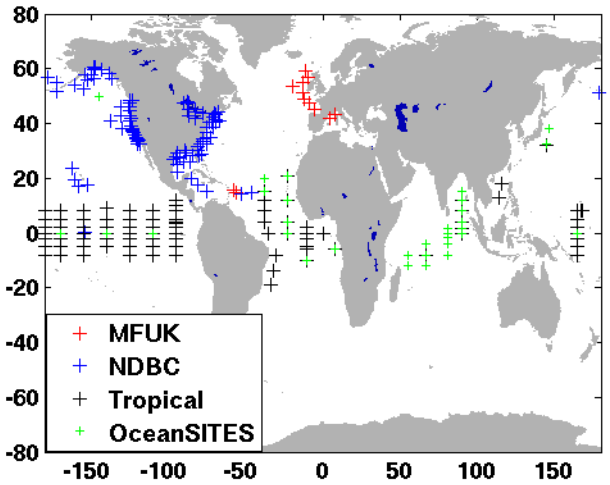








OHF : WP31 Status



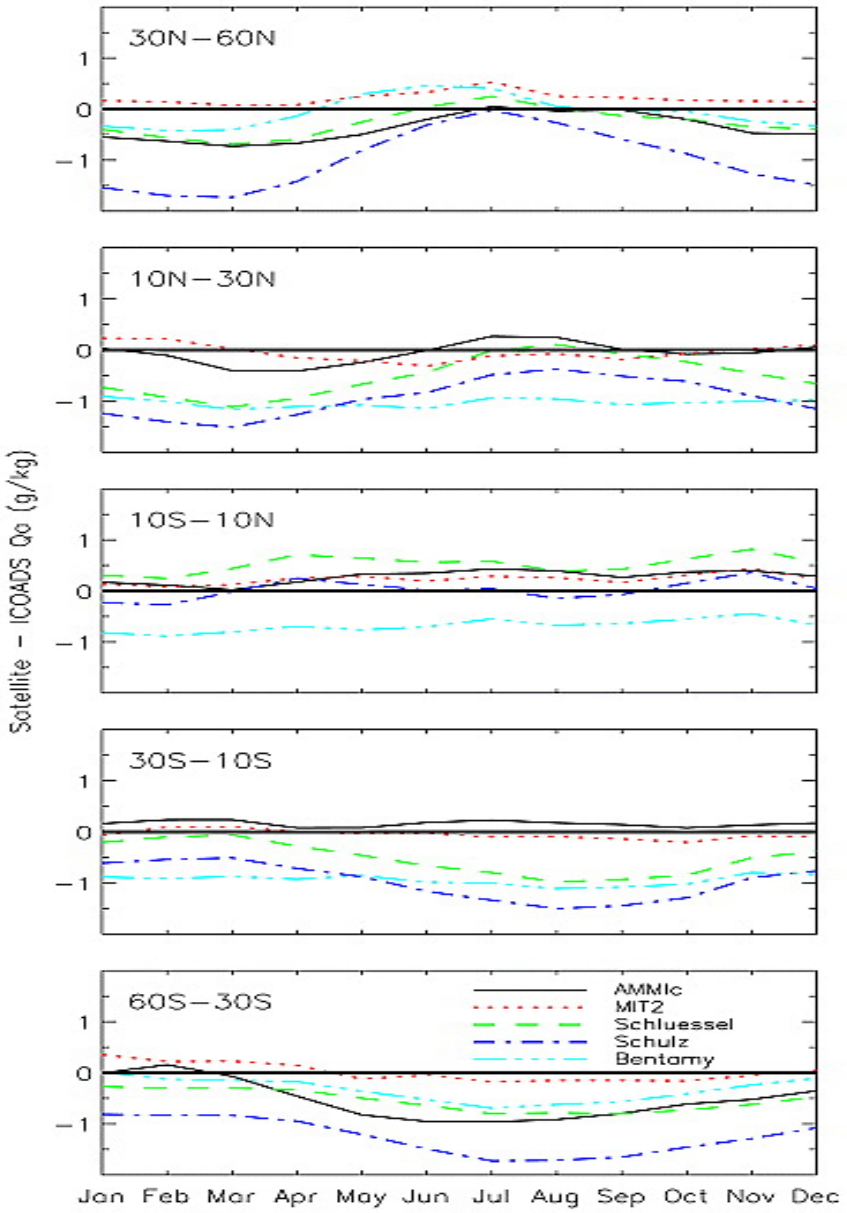
➢ Assessment of SST impact on Flux Quality: OceanSites Comparisons

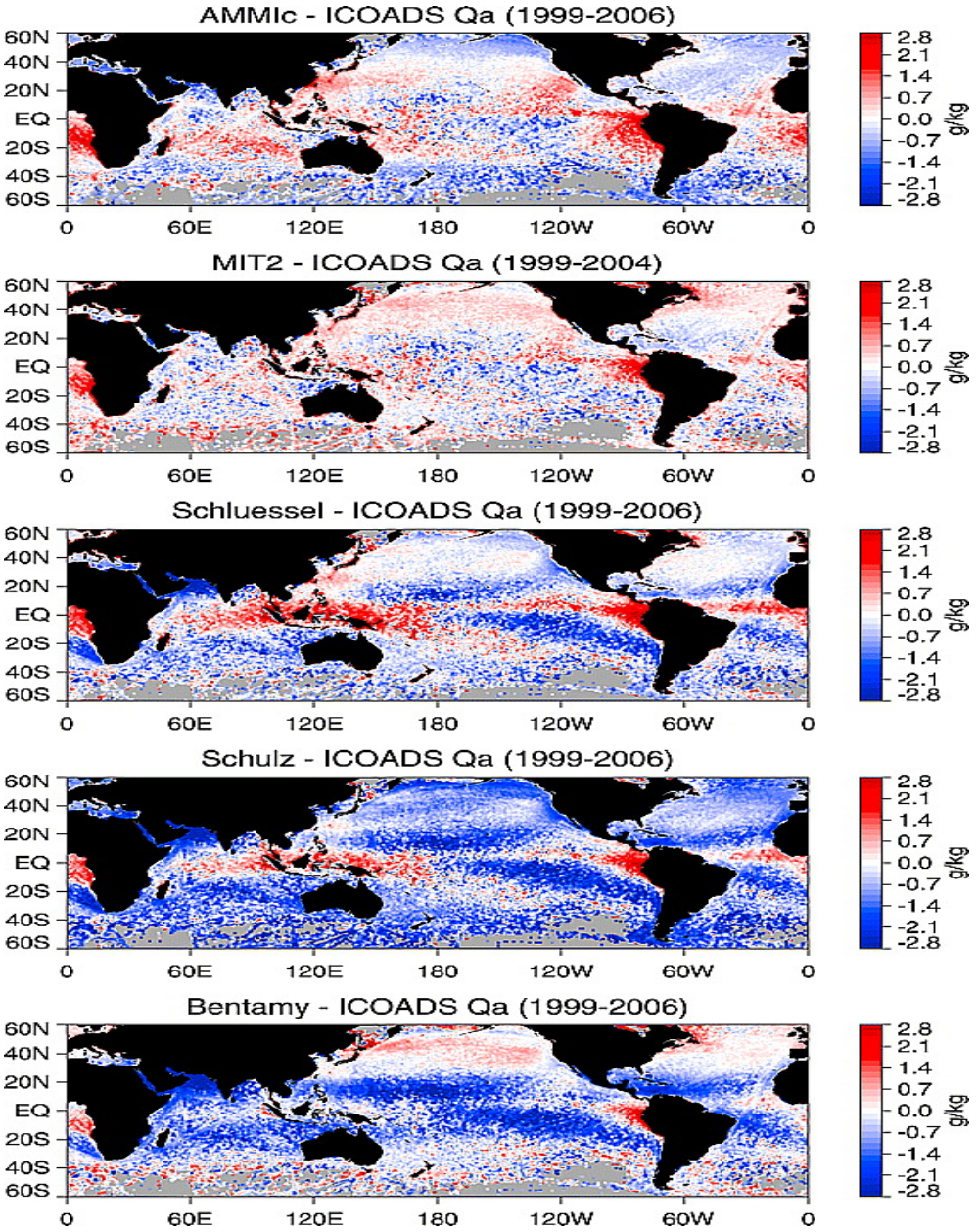
Statistic Parameters	Product	*W10*	*Qa*	*SST*	*Ta*	*τ*	*LHF*	*SHF*
Bias	IFREMER (***Reynolds***)	-0.20	-0.03	0.17	-0.11	0.00	3.41	1.98
	IFREMER (***CCISST***)			-0.02			-2.90	0.33
Standard deviation	IFREMER (***Reynolds***)	1.19	0.63	0.44	0.65	0.02	25.62	7.43
	IFREMER (***CCISST***)			0.29			26.49	7.60
Correlation	IFREMER (***Reynolds***)	0.86	0.94	0.98	0.94	0.86	0.86	0.76
	IFREMER (***CCISST***)			0.99			0.85	0.77

OHF : WP31 Status

- **WP31.4** impact of improved retrieval methods for wind speed and air humidity. Calculation of LHF and SHF based on newly processed winds and air humidity.

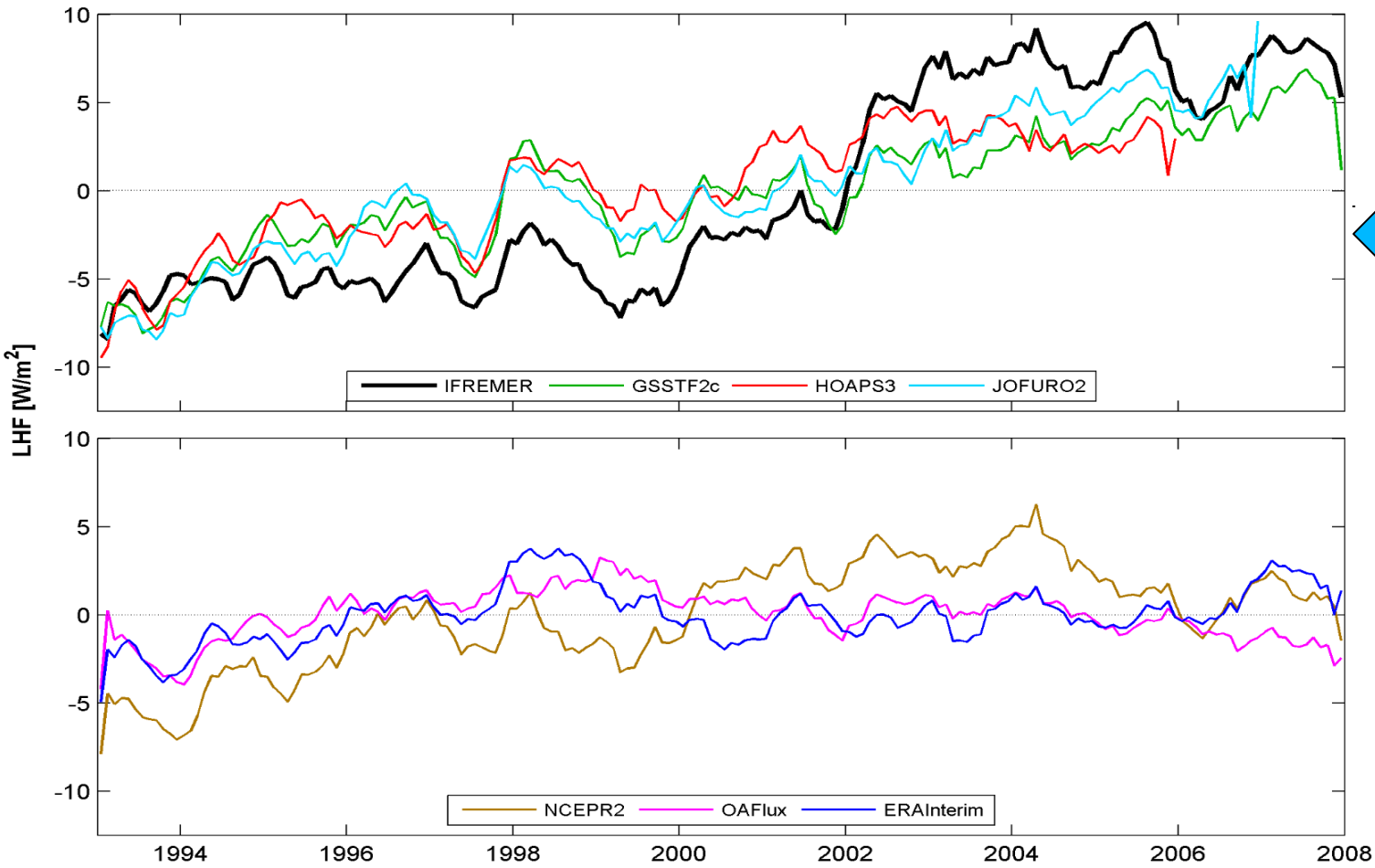
Improved multisensor approach to satellite-retrieved near-surface specific humidity observations (Jackson *et al*, 2009)



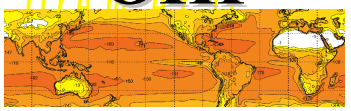


Motivation

LHF Anomaly (Mestas *et al*, 2014)



Wind Consistency Issue



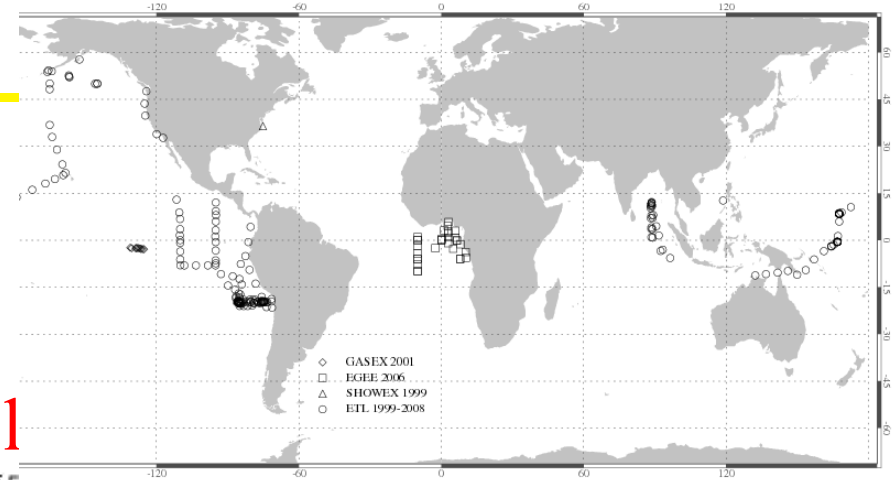
- **Wind** :
  - QuikScat retrievals (V3 (Fore *et al*, 2011))
  - Objective method (Bentamy et al, 2012)
- **Specific Air Humidity :**
  - $qa_{10} = f(\mathrm{Tb}, \mathrm{SST}, Ta)$ (Bentamy *et al*, 2013)
  - Tb are from SSM/I F10 – F15

Product Generation : Specific Wind and Air Humidity Issues

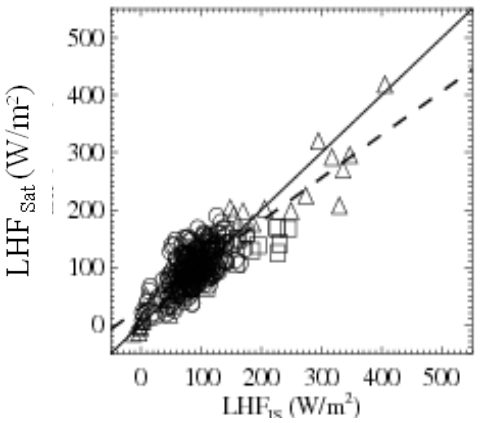
- **Consistency** (Fundamental Climate Data Record (Sapiano *et al*, 2013))
  - Tb are from Univ. Colorado / NOAA/NESDIS
- **Reprocessing**
  - $qa_{10} = f_1(\mathrm{Tb}_{19V}) + f_2(\mathrm{Tb}_{19H}) + f_3(\mathrm{Tb}_{22V}) + f_4(\mathrm{Tb}_{37V}) + g(\mathrm{SST}) + h(\Delta T)$
  - Calibration based on collocated Tb and qa_{10} from ICOADS and buoys (Bentamy *et al*, 2014)
- **New release of Daily Turbulent Fluxes : 1999 - 2009**

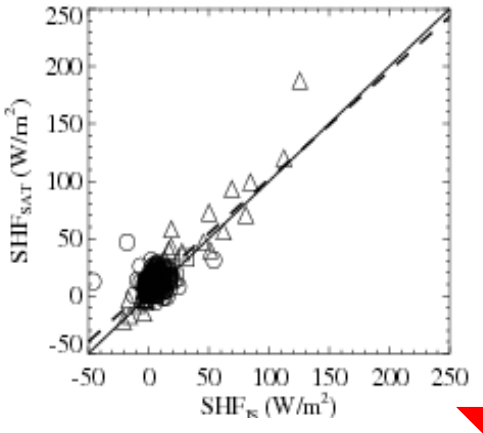
Assessment of the Turbulent Flux Accuracy

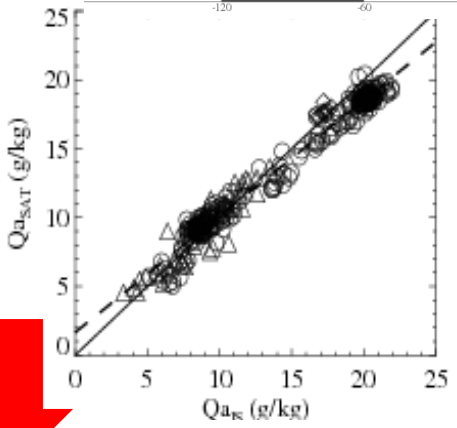
- Spatial and temporal Collocation of Daily Estimates

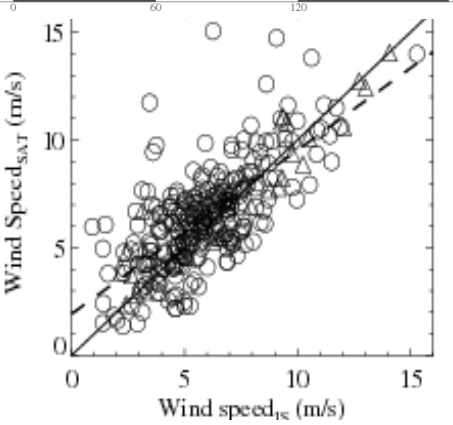


In-Situ / Satel





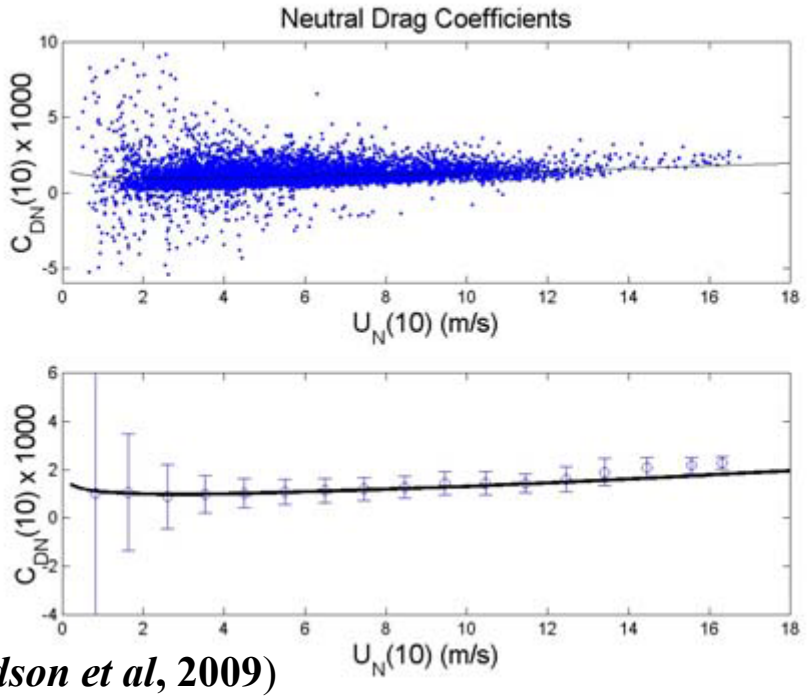




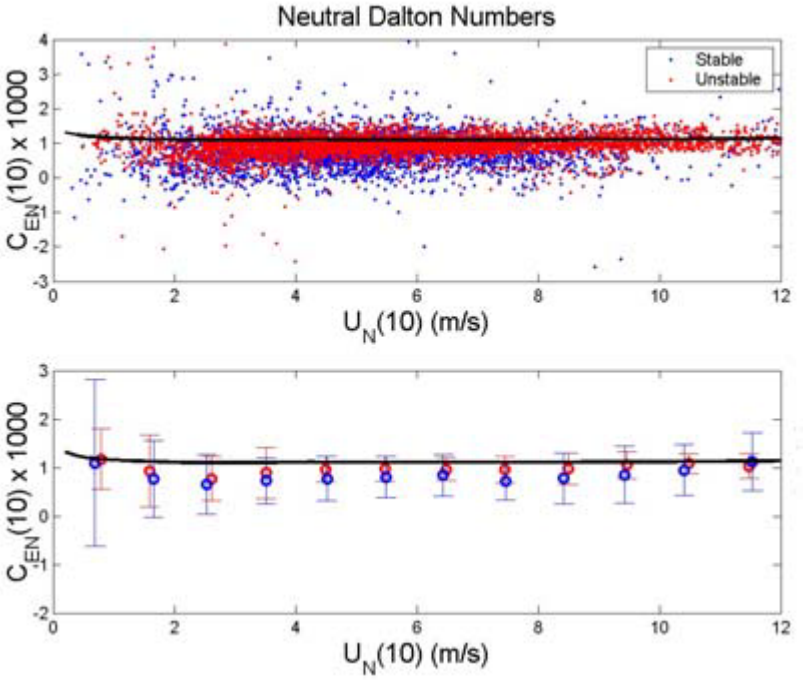
		LHF (W/m²)		SHF(W/m²)		Stress(10^{-3}N/m²)	
		Bias	SDE	Bias	SDE	Bias	SDE
	Ifremer	-6.0	31.5	-1.9	11.9	-7.5	23.3
Brunke *et al*, 2011	ERA-I	17.6	34.7	2.7	14.2	-2.3	43.3
	CFSR	19.3	44.8	-0.3	22.6	4.8	89.1
	HOAPS	1.7	50.3	-1.4	18.1		
	OAFLUX	11.6	41.0	2.2	18.1		

OHF : WP31 Status

- **WP31.5 : impact of improved flux parameterizations : analysis of the new bulk parameterization (e.g.Fairall et al,, 2011) impact on flux estimation over global ocean and over some specific regions such as the North Atlantic and tropical areas.**

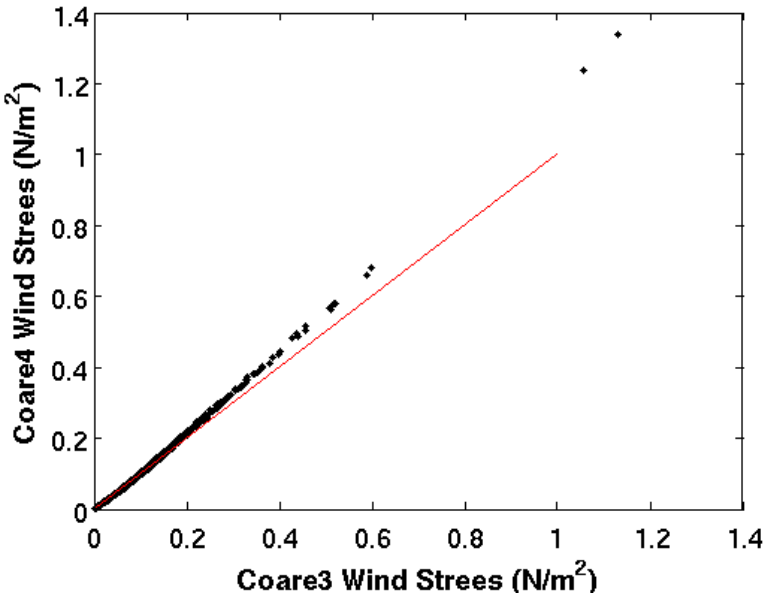


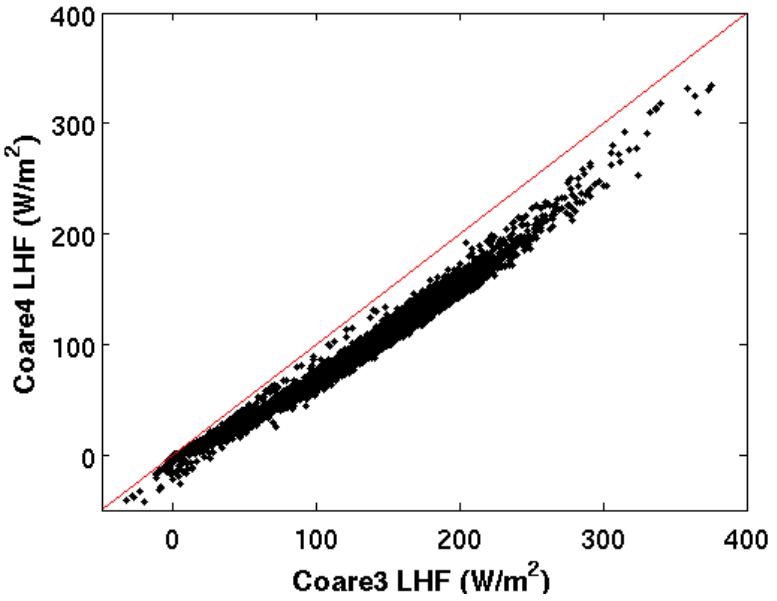
(*Edson et al*, 2009)

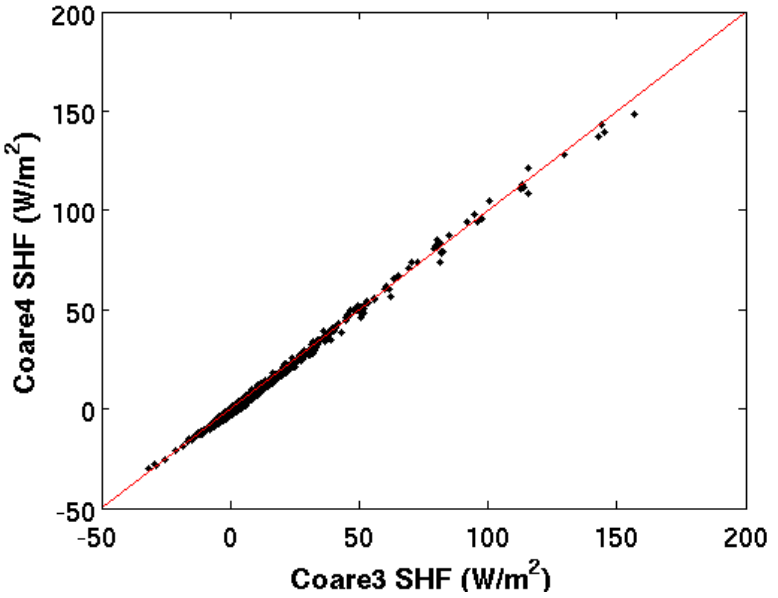


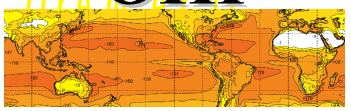
WP31.5: Assessment of bulk parameterization

- COARE3.2 and COARE4.0 parameterization Comparisons:
- Using OceanSites Measurements









OHF : WP3 Status

Product Generation, Inter-Comparison and Uncertainty Characterizations

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