Introduction From The Organizing Committee

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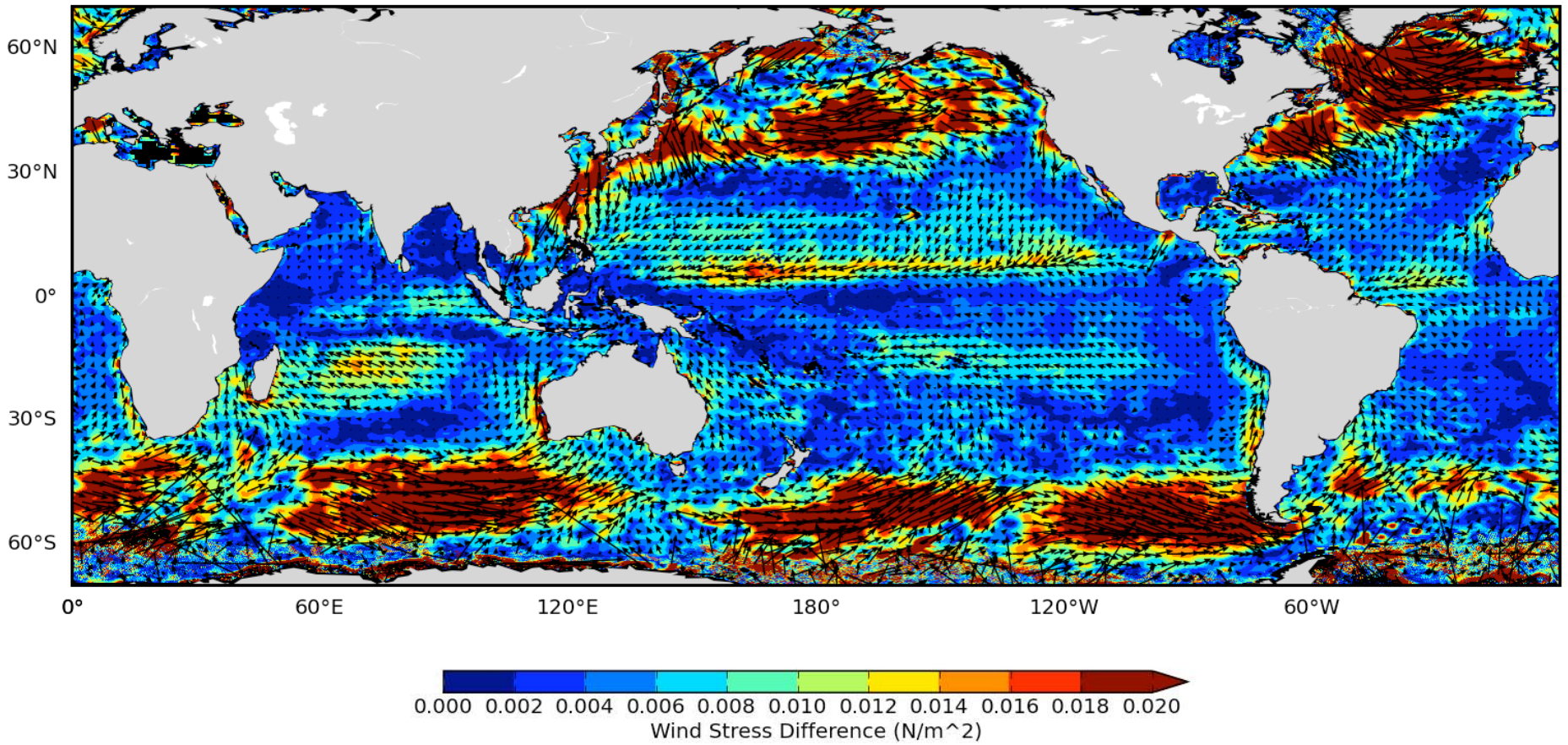
TERMS OF REFERENCE

- **Goal:**
  - To build a community of scientists working on global surface vector wind fields over the ocean to further scientific cooperation and practical application of ocean winds to societal problems.
- **Purpose:**
  - To continuously examine and improve the range and quality of ocean vector wind products available to the community.
  - To assure that scientific input is provided to development of a high quality climate record for winds over the ocean.
  - To stimulate innovation of applications using ocean vector winds for scientific and societal problems.
  - To provide scientific guidance for the development of the CEOS Ocean Vector Winds Satellite Constellation
  - To improve the user community's knowledge of strengths and weaknesses of ocean vector wind products for their applications

The Main Challenges In Satellite OVW Measurement

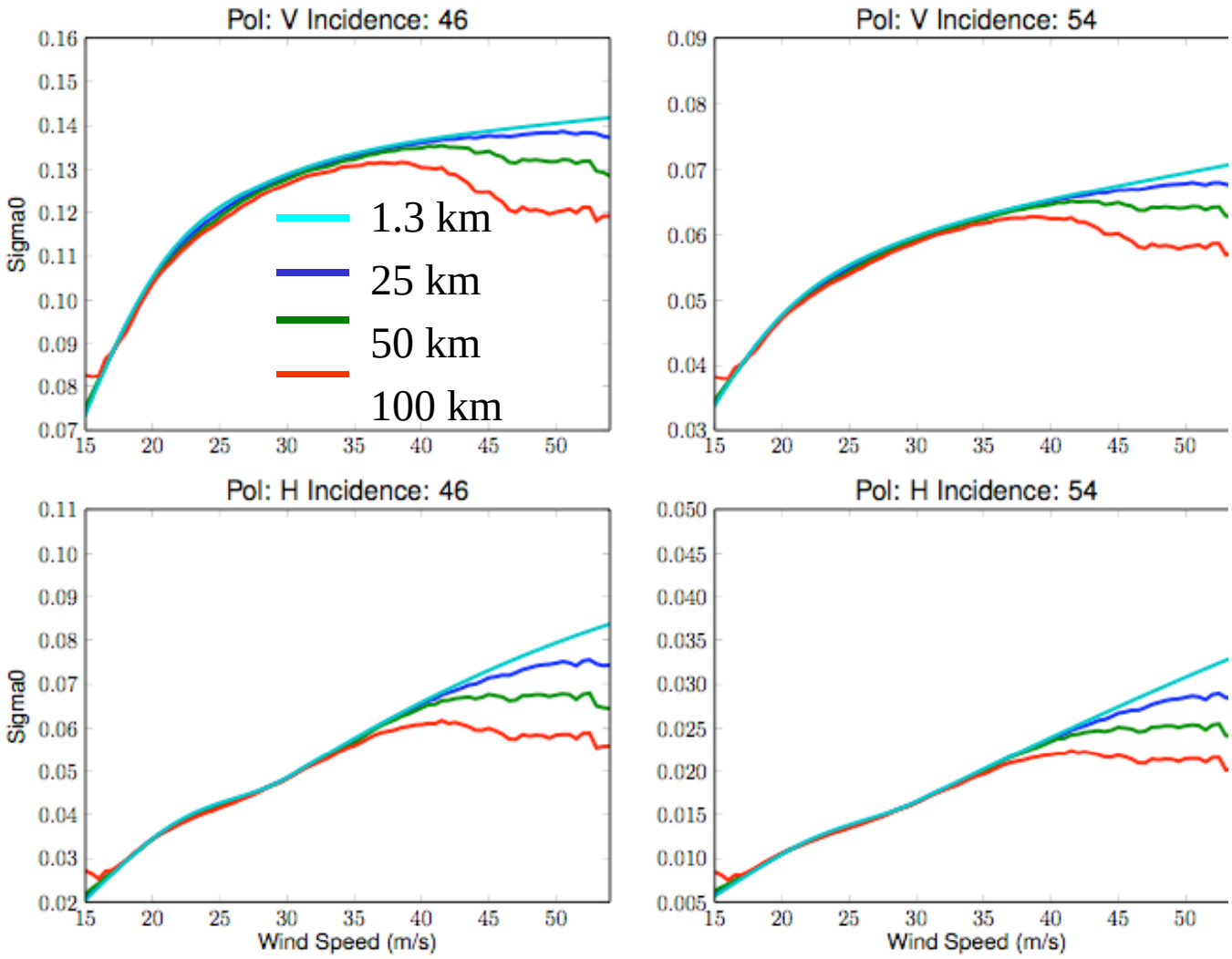
- **Availability** of data (as near real time as possible),
- **Intercalibration** of wind and wind stress (vector and scalar) sensors and **continuity** of data records,
  - Accuracy of wind and stress curl and divergence
- **Insufficient sampling** of natural variability
  - Diurnal and inertial cycles
- **Insufficient resolution** and near coastal data for non-SAR instruments
- **Rain** contamination (all-weather retrievals)
- Accuracy for **high wind speeds** (>17ms^{-1}).
- Climate studies also require very small **calibration drift**; otherwise the challenges are similar for science and operations.
- Develop **international standards** for OVW products and their characterization;
- Encourage the **development of applications** exploiting the timely and high spatio-temporal resolution OVWs

Intercalibration vs Diurnal Cycle
(QuikSCAT – ECMWF) minus (ASCAT – ECMWF)



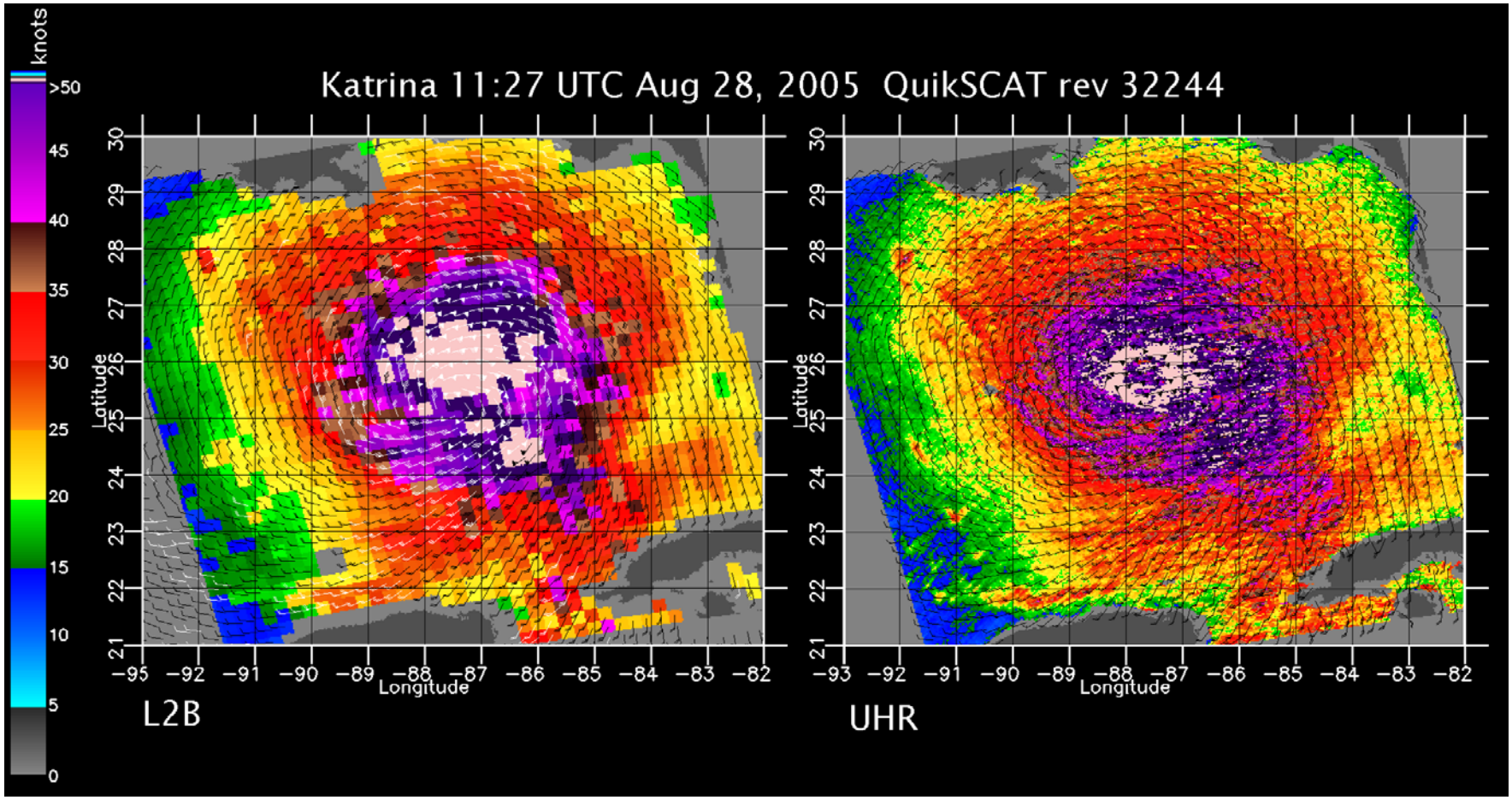
Graphic from Ernesto Rodriguez and colleagues

Calibration, Hurricanes & Footprint Size



Graphics from Ernesto Rodriguez and colleagues

Different Retrieval Techniques



QSCAT L2B
25 km product

BYU Ultra High Resolution
Approximately 5km resolution

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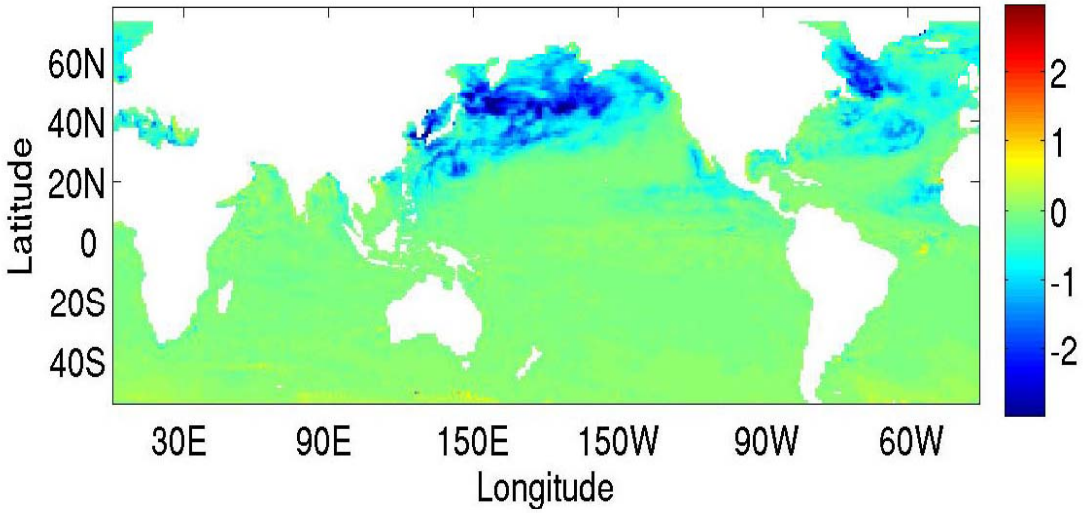
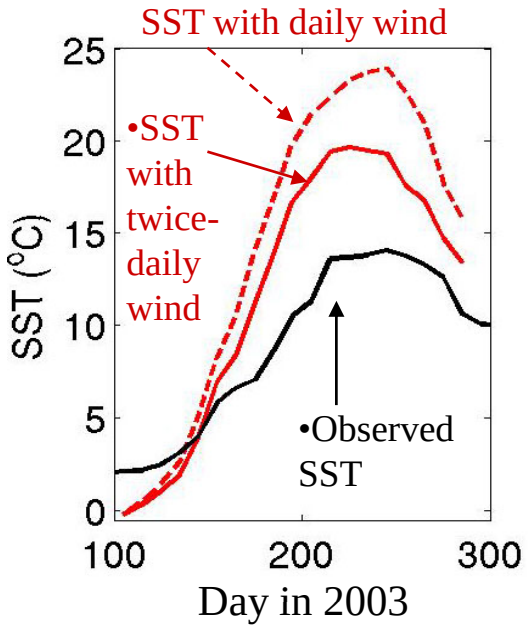
bourassa@coaps.fsu.edu

Graphic from David G. Long
The Florida State University

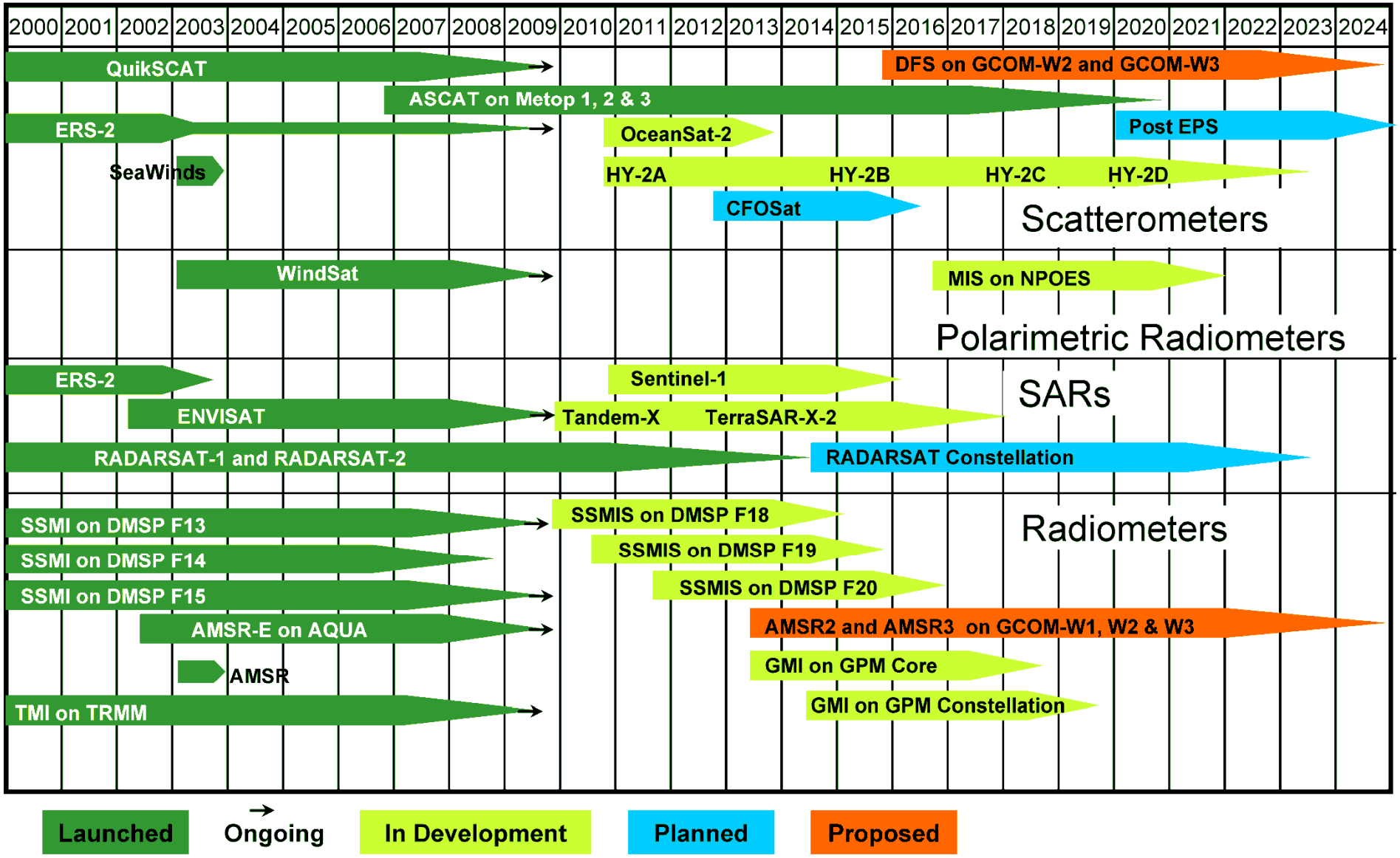
Diurnal Forcing and Ocean Mixing

Graphics from Tong Lee and W. Timothy Liu





- Change in SST with
  - Twice daily forcing (from QSCAT & ADEOS2 period)
  - Daily wind forcing (24 hour smoothing)
- Change in mixed layer depth influences the SST
- Ideally satellite orbits will be optimized to improve sampling


2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024
QuikSCAT
DFS on GCOM-W2 and GCOM-W3
ASCAT on Metop 1, 2 & 3
ERS-2
OceanSat-2
Post EPS
SeaWinds
HY-2A
HY-2B
HY-2C
HY-2D
CFOSat
Scatterometers
WindSat
MIS on NPOES
Polarimetric Radiometers
ERS-2
Sentinel-1
SARs
ENVISAT
Tandem-X
TerraSAR-X-2
RADARSAT-1 and RADARSAT-2
RADARSAT Constellation
SSMI on DMSP F13
SSMIS on DMSP F18
Radiometers
SSMI on DMSP F14
SSMIS on DMSP F19
SSMI on DMSP F15
SSMIS on DMSP F20
AMSR-E on AQUA
AMSR2 and AMSR3 on GCOM-W1, W2 & W3
AMSR
GMI on GPM Core
TMI on TRMM
GMI on GPM Constellation
Launched
Ongoing
In Development
Planned
Proposed

The Way Forward

- Data policy
  - Free and timely access to observations
- Calibration and validation of each spaceborne observing system
  - E.g., QuikSCAT, ASCAT, ISRO Scatterometer
  - Agreed definition for data products
  - The definition of mutually agreed format(s) and inter-calibrated data product(s)
- Support for continued and coordinated data collection by all agencies to prevent a climate data gap (Continuation of ASCAT and OceanSat series)
- Harmonization of launches and orbits to optimize coverage in space and time
  - Continuity of types of observations

The Way Forward

- Development and demonstration of systems capable of collecting improved observations (new technology & combined observing techniques
  - Enhanced capabilities
    - higher resolution
    - closer to the coast
    - improved all-weather and
    - all-wind-regime capabilities (low speed and high speed)
  - Examples
    - Dual Frequency Scatterometer (DFS)
    - eXtended Ocean Vector Winds Mission (XOVWM)
- Continued efforts to improve wind & stress products