Scatterometer High Winds Workshop

December 9-10, 2015
National Hurricane Center

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Workshop Objectives

- How to best develop and validate high wind retrievals?
- What are the best sources of high wind "truth" and what are they really telling us?
- What's really happening at the air-sea boundary in these conditions?
- How to reconcile spatial resolution of the measurements with the spatial resolution over which the winds are actually occurring?
- What are the validation approaches and methodology for high winds and should standards be established?
- What are the next steps needed to advance our understanding of what's going on?
- …

The expectations of this workshop are not to solve all the open questions within two days, but to at least identify the issues and reach some sort of consensus on a path forward to resolve.

- **Wednesday – 09 December 2015**
- 09:00
  - Welcoming remarks and introduction (P.Chang/Z.Jelenak)
  - NHC perspective on high winds (J.Franklin, M.Brennan)
- 09:30
  - Scatterometer geophysical model function (GMF) summary - Brief overview of current GMFs being utilized (retrieval approach, validated wind ranges, etc.)
    - GMF introduction (Z.Jelenak)
      - KNMI approach (A.Stoffelen)
      - JPL approach (B.Stiles)
      - Remote Sensing Systems approach (L.Ricciardulli)
      - NOAA approach (S.Soisuvarn,Z.Jelenak)
      - IWRAP (J.Sapp, S.Frasier, J.Carswell)
      - SAR (R.Foster, A.Mouche)
    - Discussion
- 12:00-13:30 Lunch
- 13:30
  - High wind "truth" sources (strengths, weaknesses, what are they really telling us?)
    - GPS Dropsondes (R.Foster, C.Fairall)
    - SFMR (J.Carswell)
    - HWind (M.Powell, M.Kozar)
    - Others sources?
    - Discussion
- 16:30
- Summarize philosophical discussions topics from the day

- **Thursday – 10 December 2015**
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- 09:00
  - Review of previous day
  - The ocean surface
    - What's really happening down there? (D.Vandemark, J.Edson, J. Stopa)
    - Discussion
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- 11:30 – 13:00 Lunch
- 13:00
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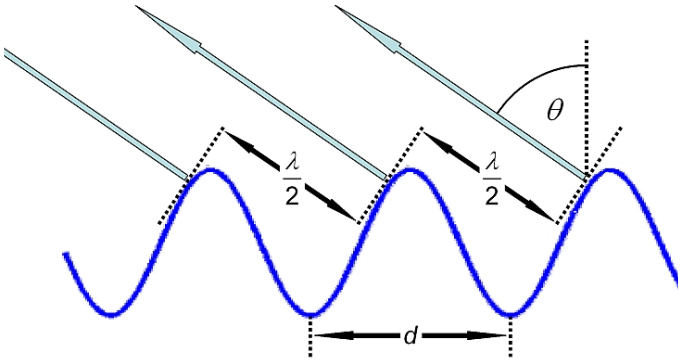
  - Scatterometer retrievals revisited – how high a wind should we expect to retrieve from current satellite scatterometers
    - Spatial scale considerations
    - Frequency/polarization sensitivities
    - Other limiting factors?
  - Next steps
    - How should we validate current/future high wind algorithms
    - Are there other validation sources/approaches that should be investigated or pursued further
    - Field experiments that could/should be leveraged?
    - Do we need to improve our understanding of the physics at the air-sea boundary and how?
    - Identify outstanding issues and possible resolution
    - Implications for future scatterometer systems
  - Wrap-up and assignments

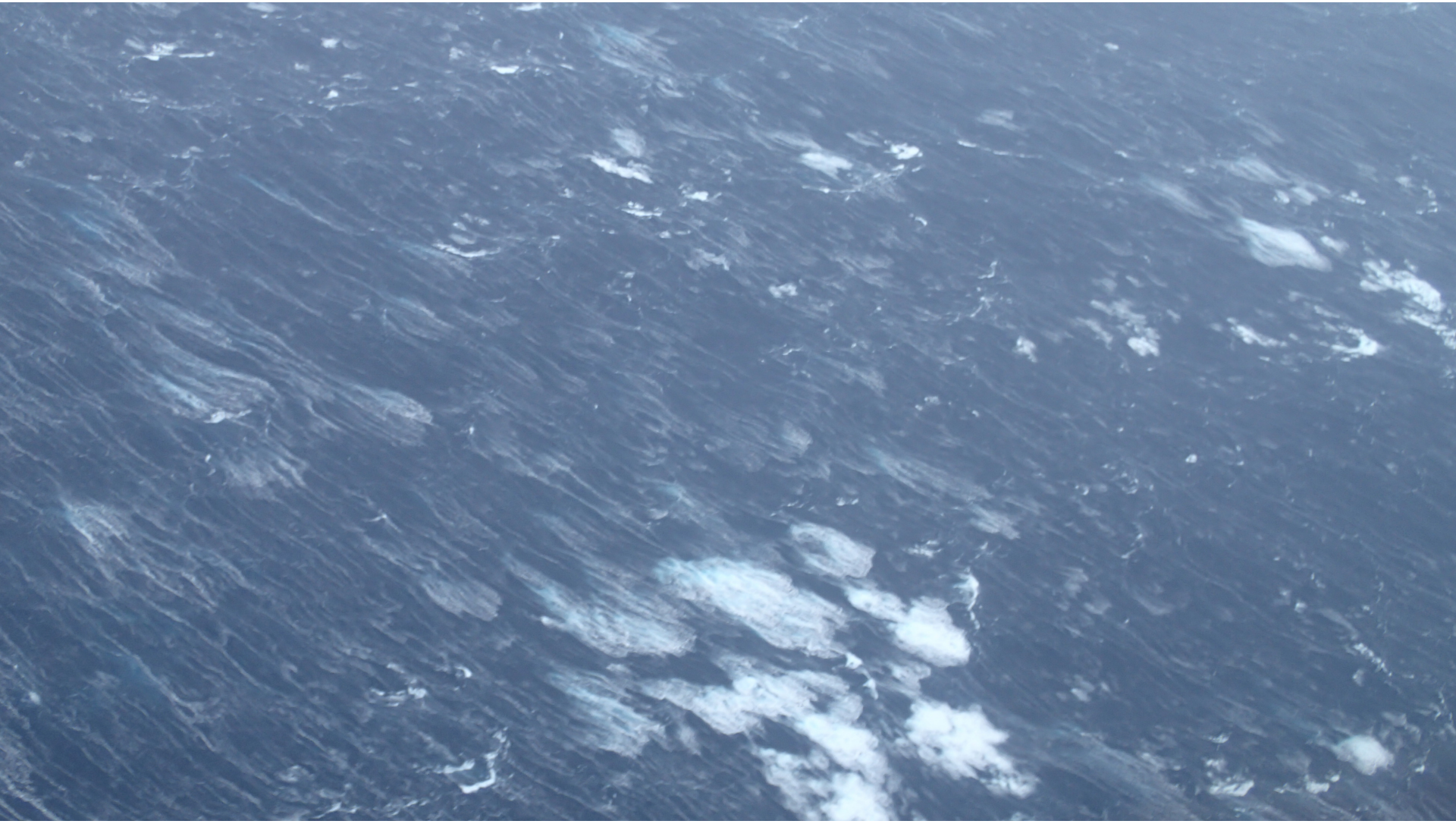
- 16:00 adjourn

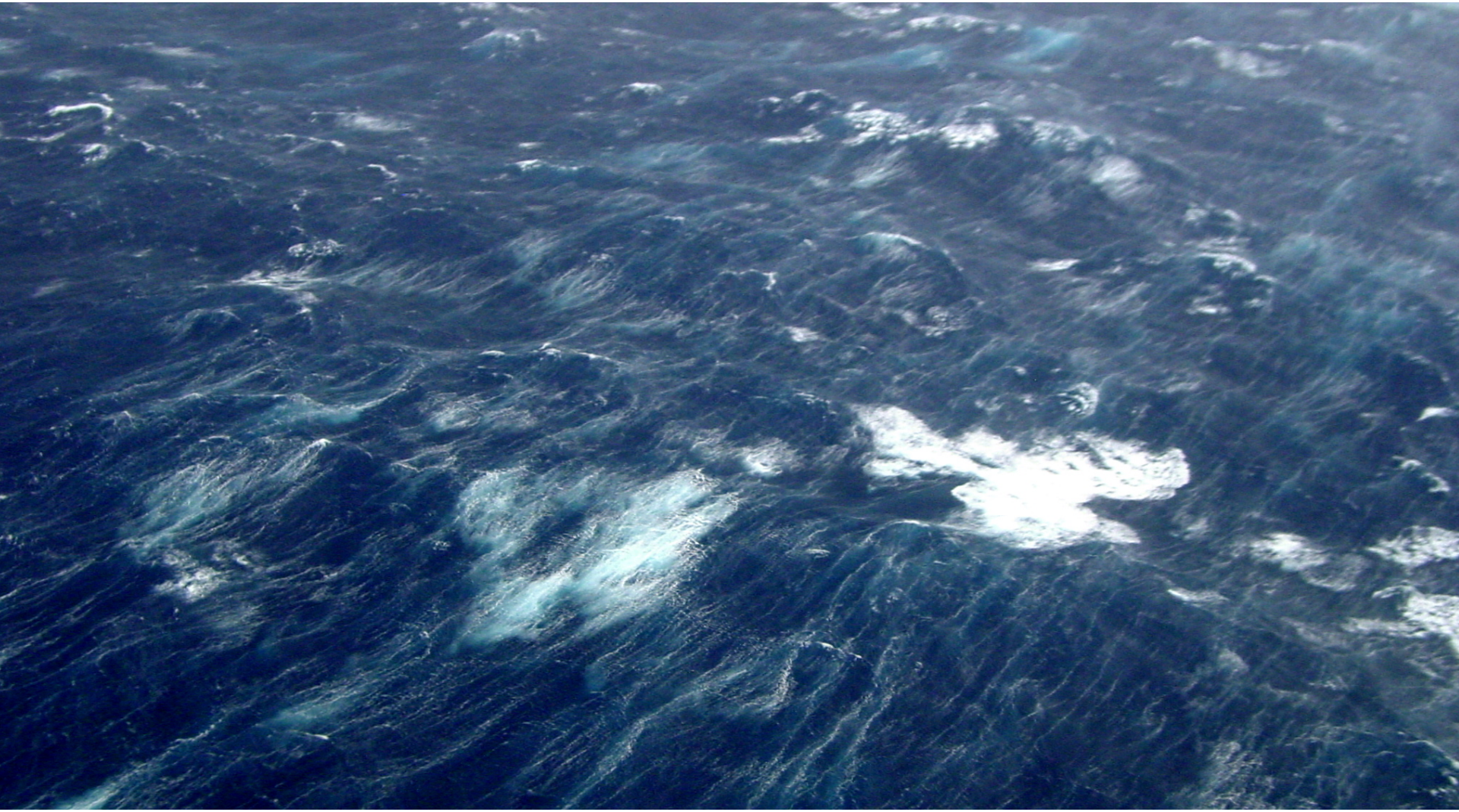
Wind Retrieval From Scatterometers A Simplistic Overview

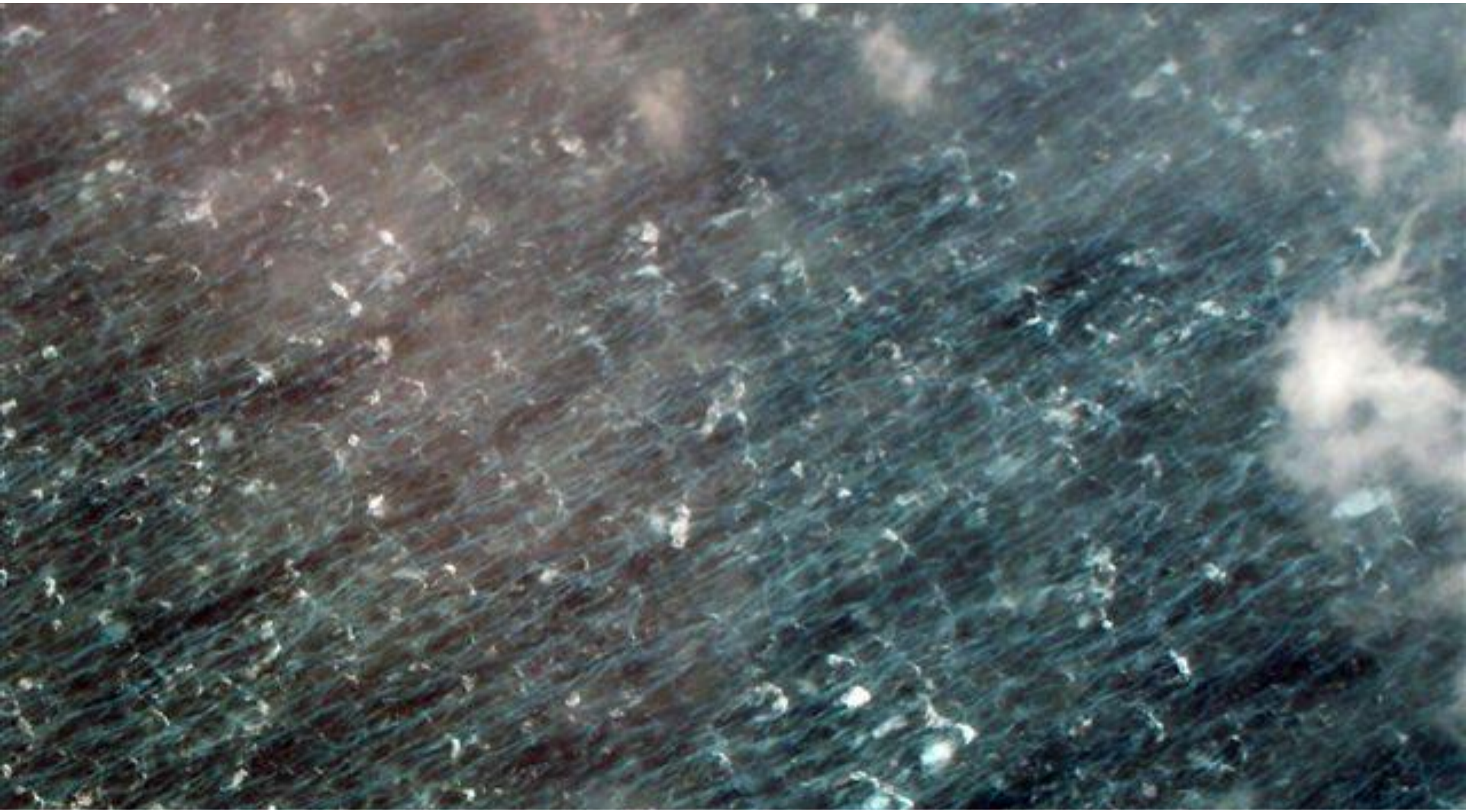
- Utilize the periodic nature of waves
  - Bragg Scattering
- Select a radar operating frequency for waves closely coupled to local winds (C-band and Ku-band)
- Develop empirical relationship between the radar measurements and local winds
- We can now retrieve the wind at the ocean surface
- BUT..
- What happens at very high winds when Bragg Scattering starts breaking down? (i.e., not necessarily the dominate scattering mechanism)
  - What are the radar measurements responding too and how does this relate to the winds?
  - The surface gets complicated...

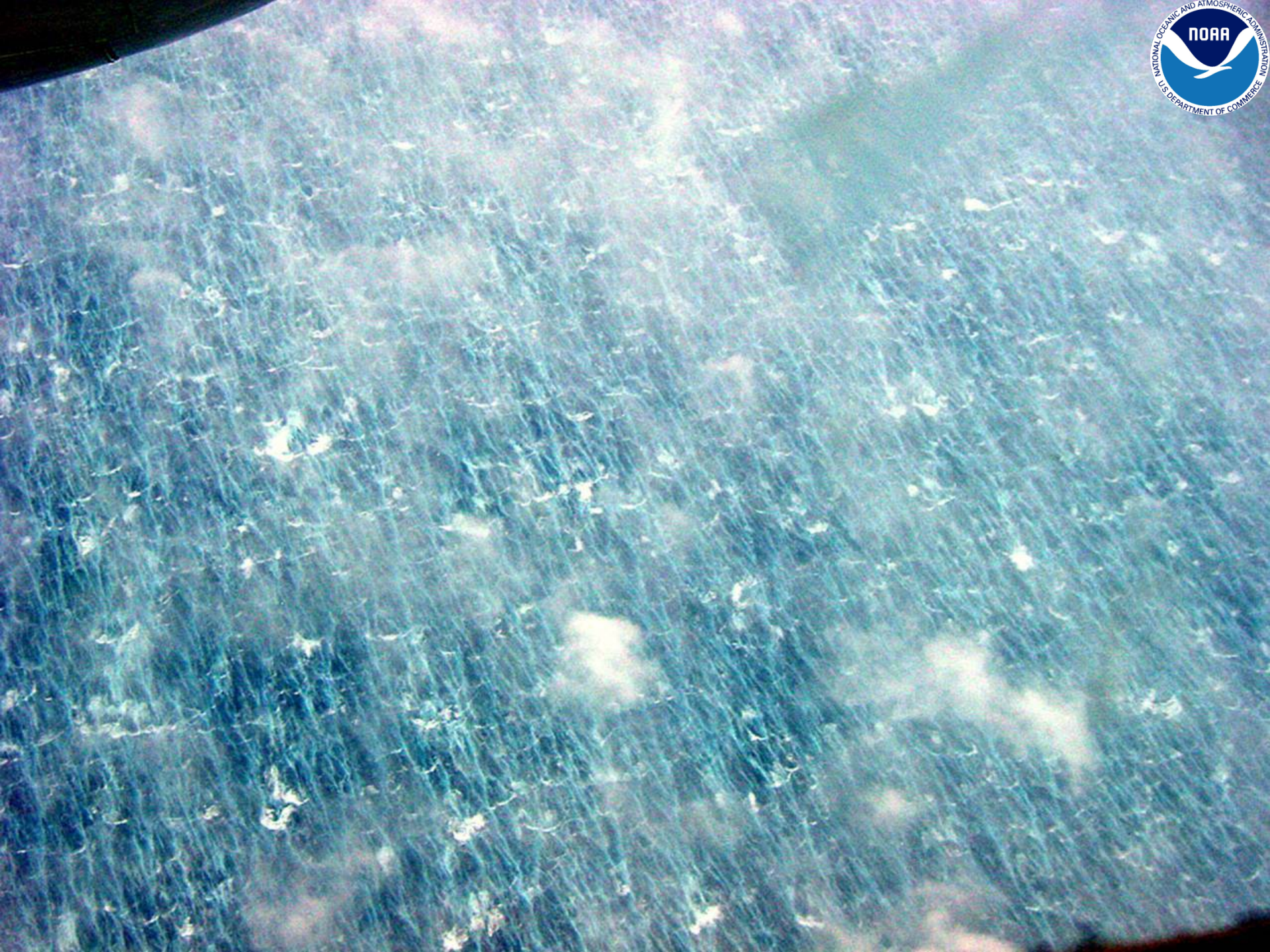


But this is what we have come together to discuss





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