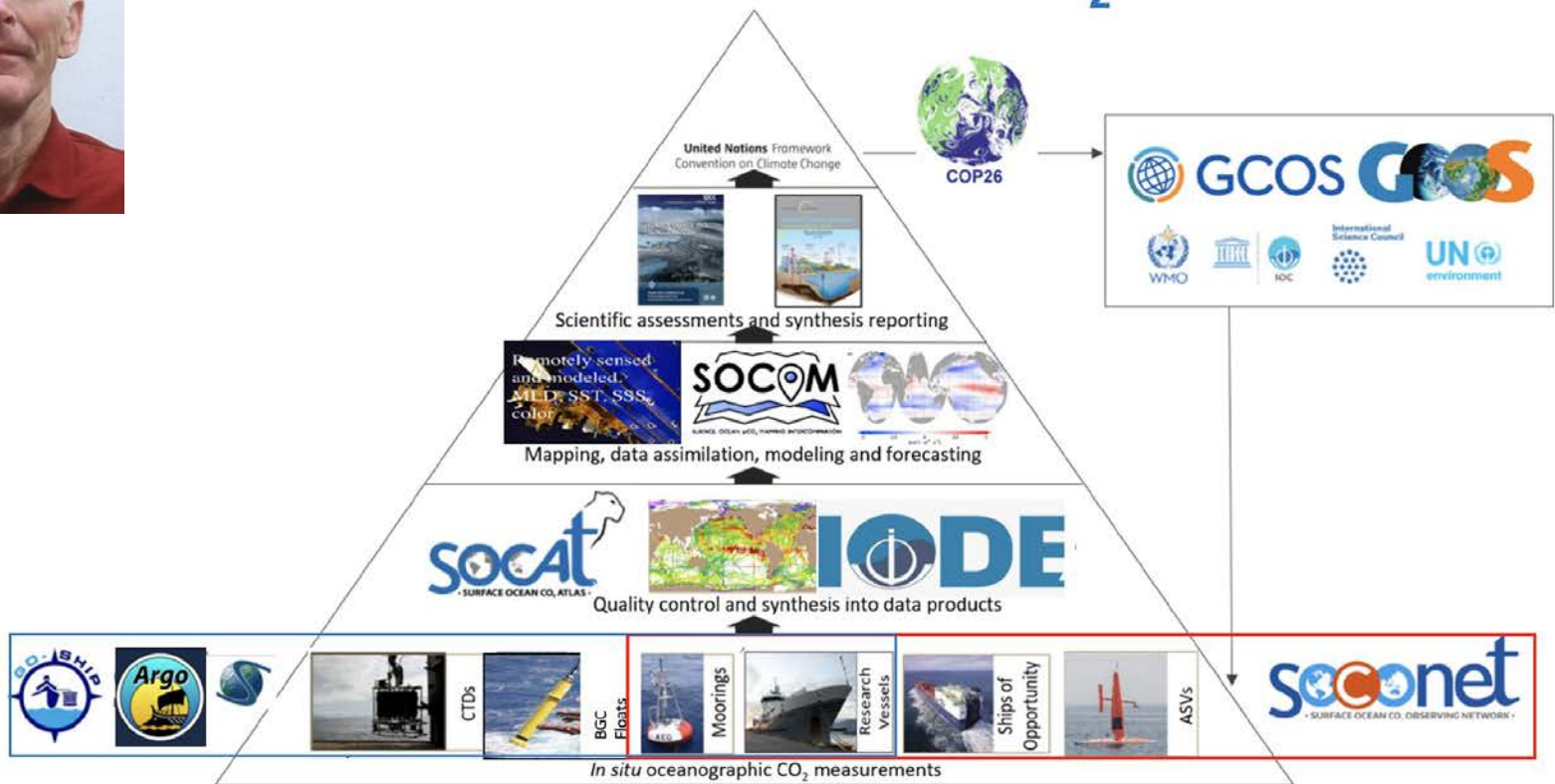


A Global Surface Ocean Carbon Dioxide (CO₂) Network to quantify ocean CO₂ uptake on seasonal timescales in near real-time



Rik Wanninkhof, Senior Scientist NOAA/AOML



The Value Chain of Surface Ocean CO₂ Measurements

(Modified from Bakker; and Guidi et al. (2020) Big Data in Marine Science. EMB Future Science Brief 6, 10.5281/zenodo.3757793)



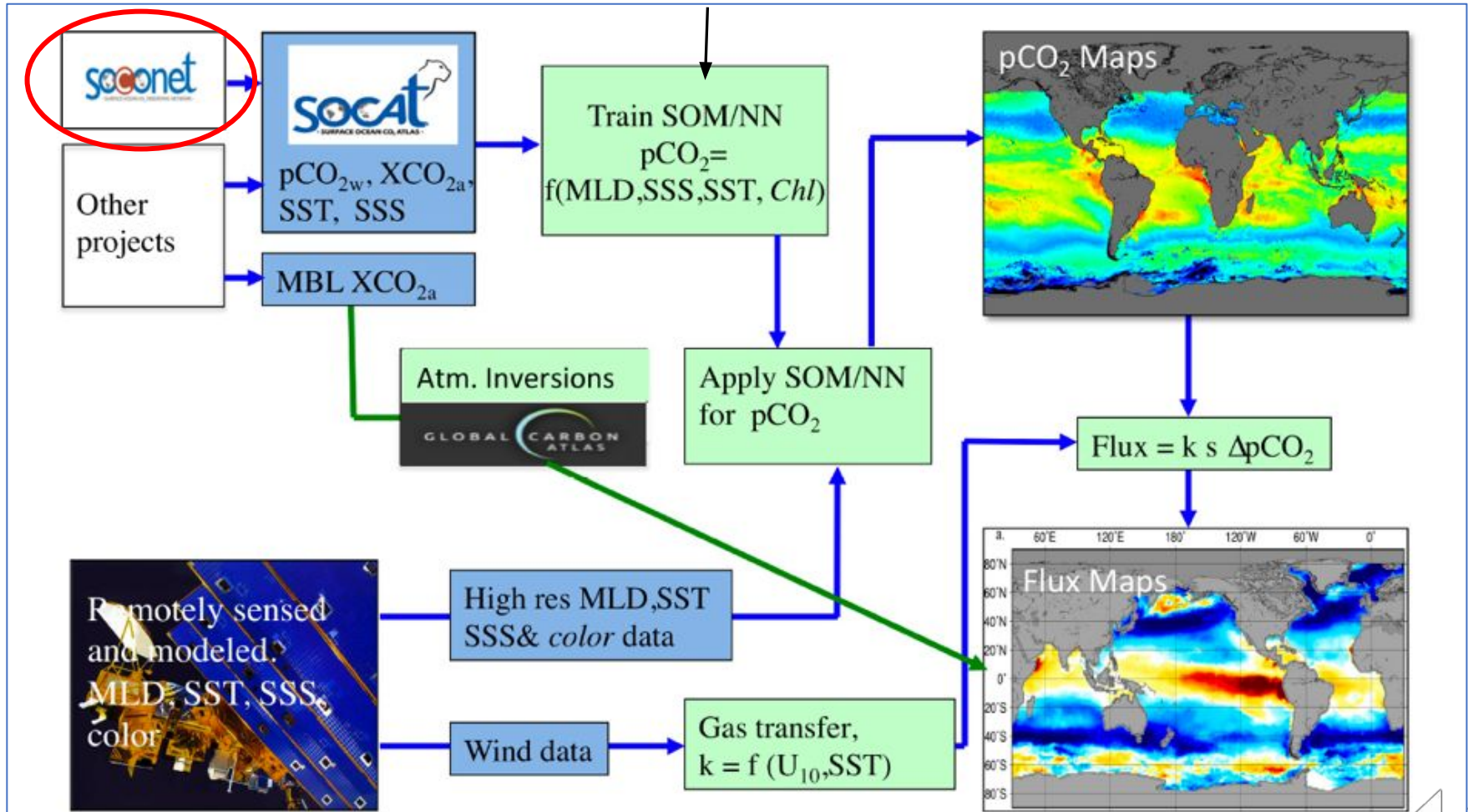


Rick Spinrad, NOAA Administrator
Session: the future of climate modeling
(COP26 November, 2021)



Surface Water CO₂ Observing System

The SOCONET Network as part of the CO₂ observing system

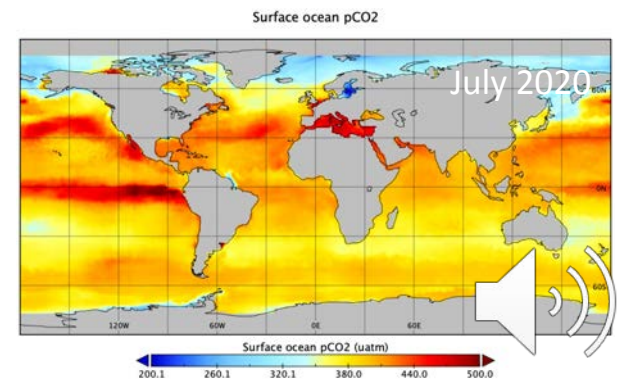
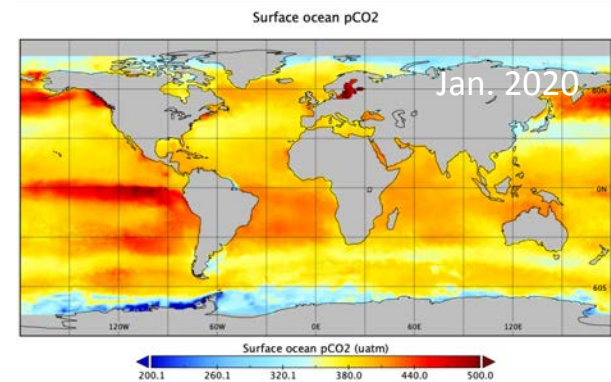
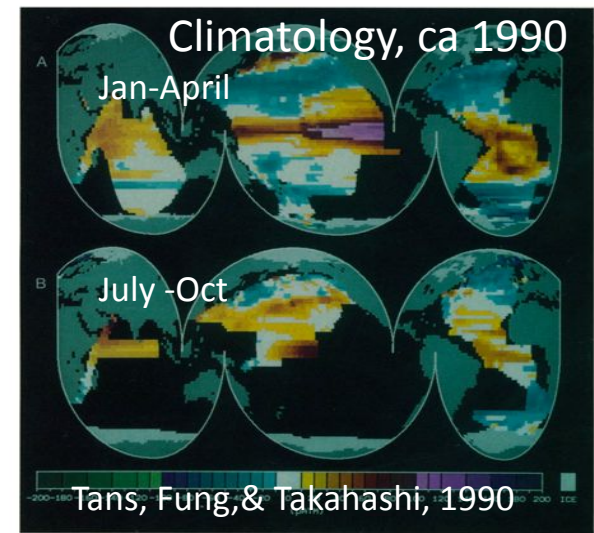


Improved products over time

- NOAA has sponsored underway CO₂ measurements from research ships for over 30 years
- GOMO provides sustained funding for SOOP, Moorings, (and ASVs) (≈ \$2 M/yr)
- Coordinated data ingestion, QC and distribution through SOCAT
- Contributes to the UN SDG 14.3 (reduce OA)
- Data is used to create monthly flux maps with machine learning techniques
- Used in global and regional assessments (IPCC, RECCAP)

But.....

...



Discrepancies with models and data-based products require better data

- Need an operational system to assure continuity, high quality
- Areas requiring further research: Decadal variability and Magnitude of sink
- Urgency- decisions on climate mitigation, marine carbon dioxide removal, ocean health and emission reduction require a trustworthy observation based air-sea CO₂ flux product

A Surface Ocean CO₂ Reference Network, SOCONET and Associated Marine Boundary Layer CO₂ Measurements

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