A51D-0140

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Aerosol and Cloud Observations at an Ocean Platform

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CERES Ocean Validation Experiment(COVE) website: http://cove.larc.nasa.gov/

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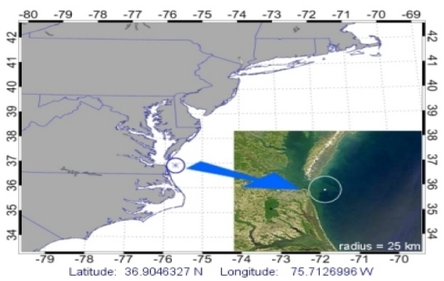


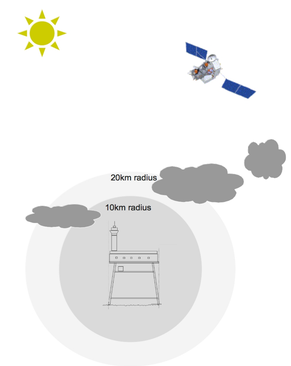
COVE is located approximately 25 km off the coast of Virginia Beach, Virginia

METHOD:

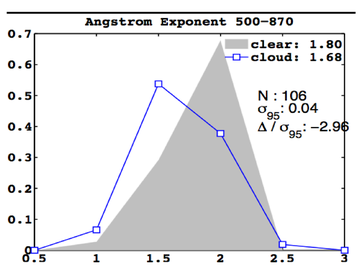
+GOES imagery provides cloud properties every 30 minutes.
+We use GOES images to find days that include clear scenes (cloud fractions < 5%) and cloudy scenes (cloud fraction > 50%) on the same day.
+We constrain the study to low-level clouds liquid clouds (Z < 2km), which are more sensitive to boundary layer aerosols than higher level clouds.
+We constrain the study to summers (June, July, August) in the years 2000-2007.

CONCLUSION:

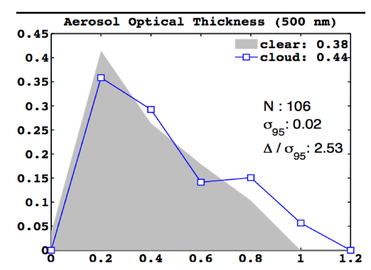
* **As clouds evaporate throughout the day, so do the aerosols.**
* **Larger aerosol particles, as indicated by the Angstrom Exponent, and Aerosol Optical Depth occur in cloudier conditions.**
* **Meteorology variables Relative Humidity and Temperature change significantly as illustrated by the delta/sig95 while Pressure,Wind Speed and Wind Direction do not.**



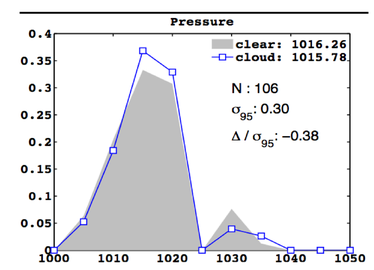
This cartoon illustrates how cloud products are derived in a 10 and 20 km grid centered at COVE. GOES-EAST VISST derived cloud products are computed from the individual pixel retrievals at both a 10 km (23 pixels) and 20 km (94 pixels) radius. GOES-EAST images are captured every half hour. Therefore, the cloud products will take into account the portion of COVE blocked due to clouds.



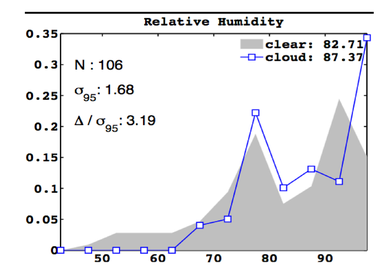
-2.96 indicates a significant decrease in AE, which indicates larger particles in cloudy conditions



2.53 indicates that the AOT is greater in partly cloudy conditions than clear conditions



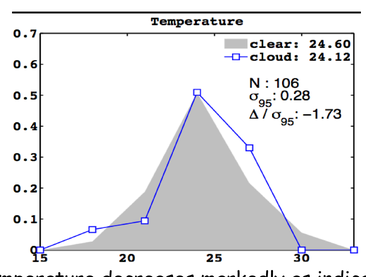
Pressure does not change much as indicated by delta/sig95



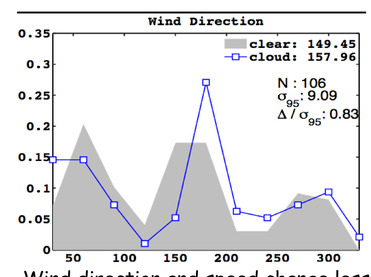
Relative Humidity increases significantly in cloudy conditions which is no surprise.

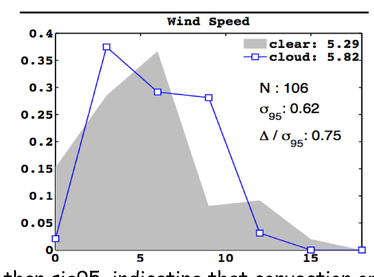
REFERENCES:

We thank AERONET and Brent Holben for their effort in establishing and maintaining the COVE site.
We thank the NASA Langley Cloud and Radiation Group led by Patrick Minnis.
Koren, I.,et al (2007), On the twilight zone between clouds and aerosols, *Geophys. Res. Lett., V(34), L08805*,doi:10.1029/2007GL029253.



Temperature decreases markedly as indicated by the delta/sig95.





Wind direction and speed change less than sig95, indicating that convection or system winds do not dominate