

The Influence of Light Absorbing Aerosols on the Radiation Balance Over Central Greenland

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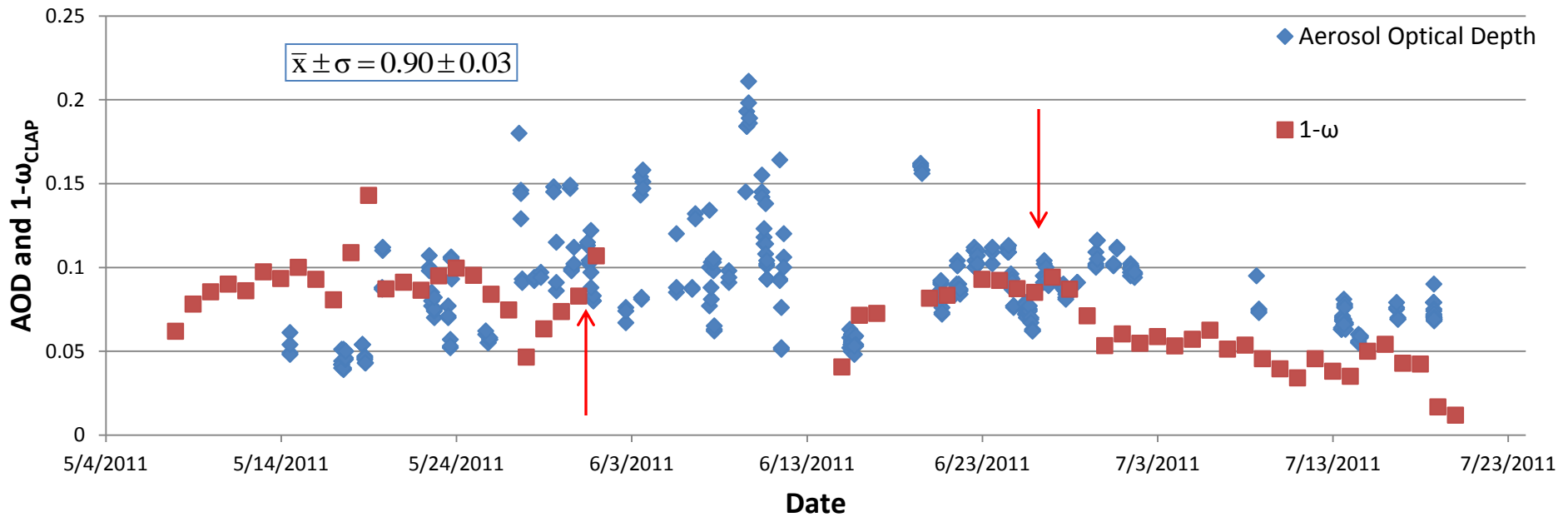
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Important Questions

- **What is the sign and magnitude of the direct aerosol radiative forcing over central Greenland at the surface and at the top of the atmosphere?**
- **How do changes in the surface albedo affect the direct aerosol radiative forcing?**
- **Which sources and source regions contribute to the aerosol loading over central Greenland?**

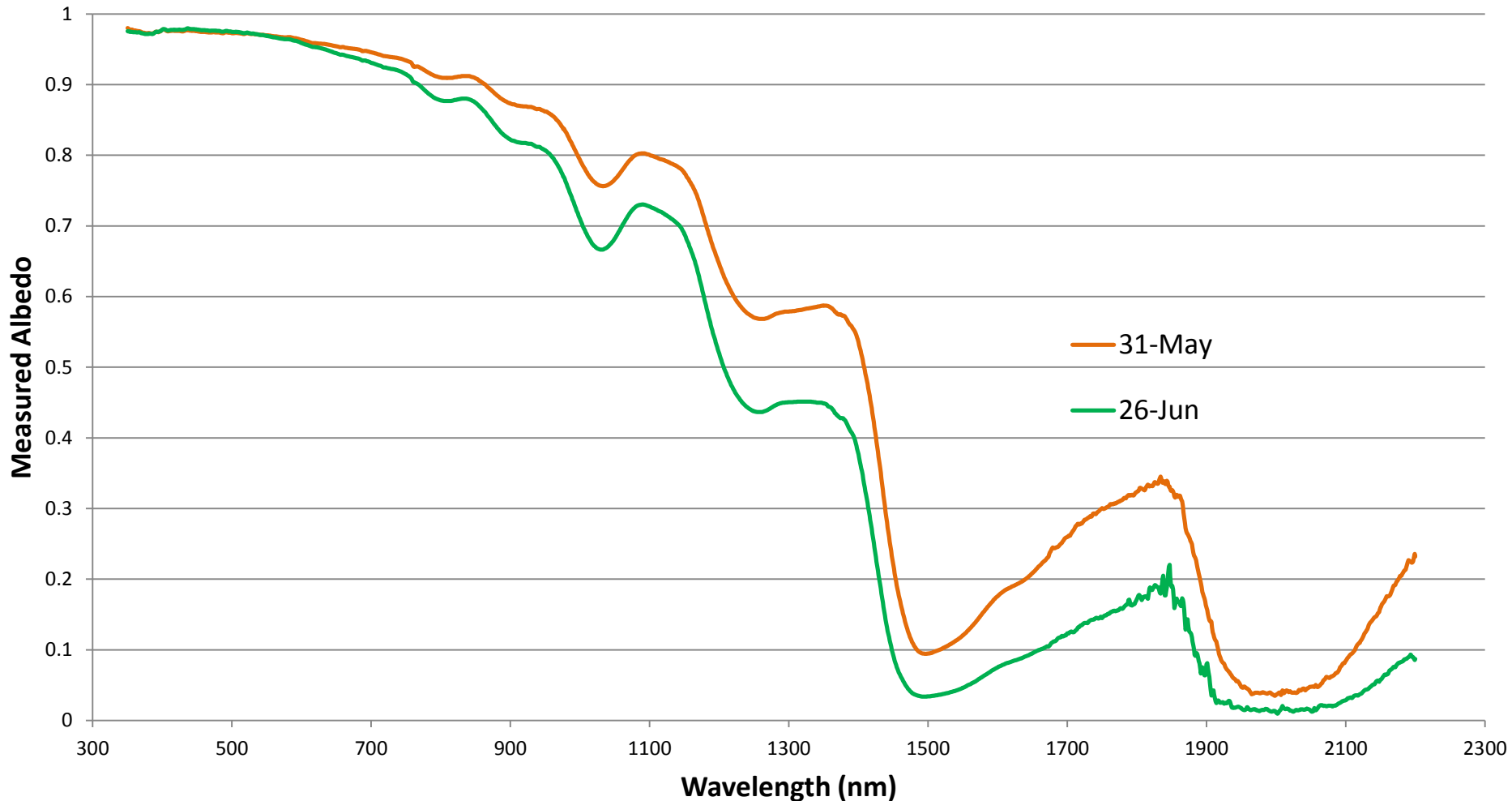
Results: Real-time Aerosol Measurements

AOD (500 nm) and $1-\omega_{\text{CLAP}}$ (550 nm)

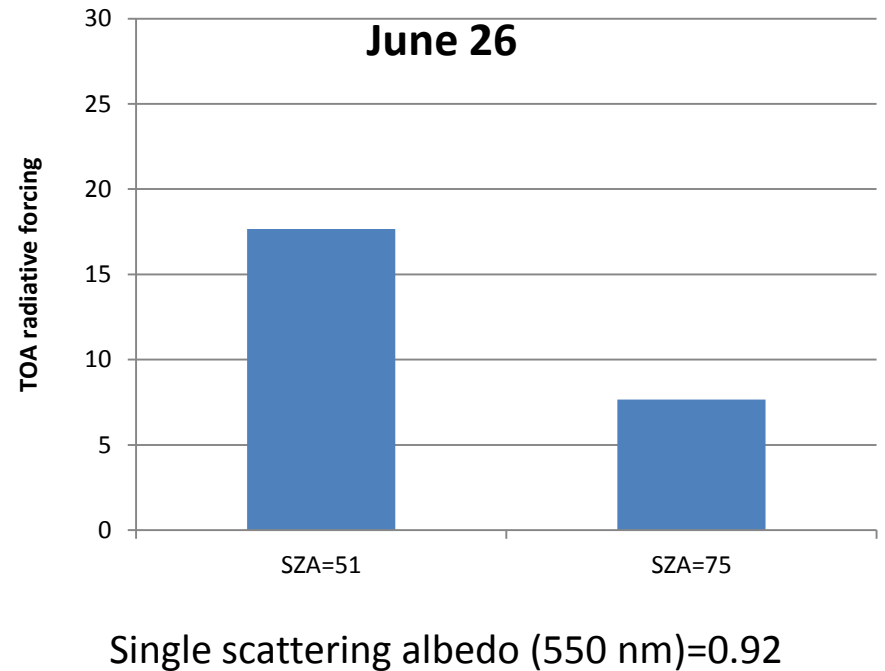
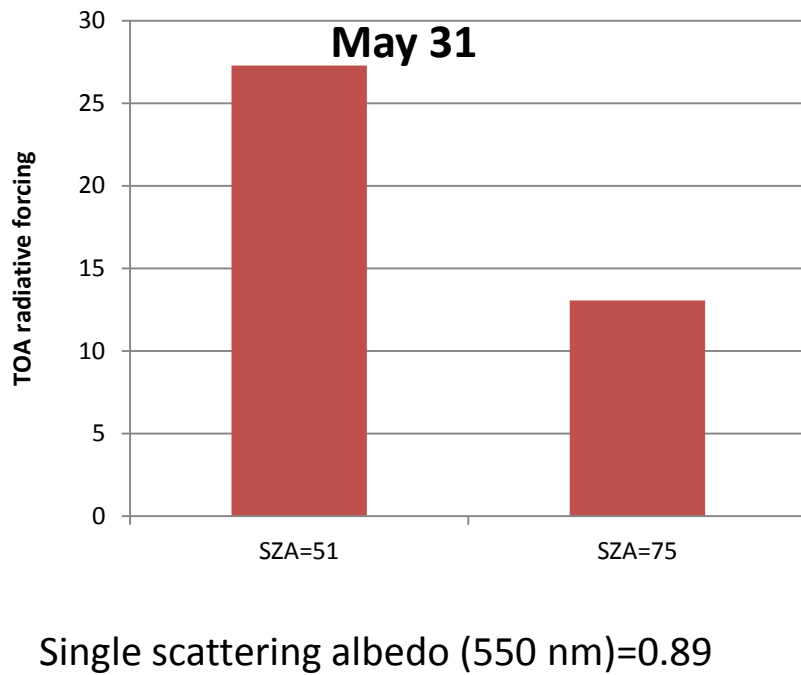


Results: Variability in Spectral Albedo

Measured Spectral Albedo for May 31 and June 26



Results: Assessment of TOA radiative forcing



Aerosol optical depth (550 nm) = 0.1

Differences in TOA forcing are due to a combined effect of spectral surface albedo and single scattering albedo

Future Work

- **Estimate the seasonal direct radiative forcing effect since 2011 (Gatech/NOAA/GAW data)**
- **Figure out how to include cloud/aerosol forcing (NSF pending proposal with NOONE/NENES relying heavily on ICECAPS data)**
- **Determine overall influence of aerosols on climate over Greenland**