

Using smartphones to measure optical properties

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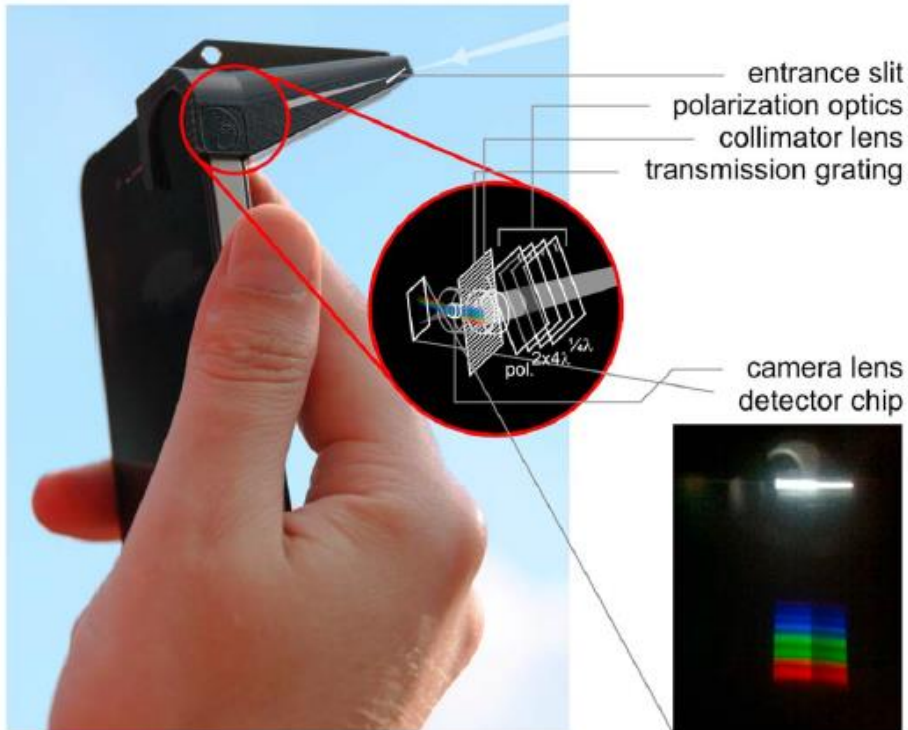
If you want a chance to get one of eight 18% gray cards, download the Albedo App now (Apple or Google App store).

We will ‘play’ with this app at the end of my short presentation.



Using smartphones to measure optical properties

iSPEX (for iOS)



8000 built & distributed
3 crowd sourcing events in the Netherlands:

7/8/2013: 6007 measurements

7/9/2013: 1546 measurements

9/5/2013: 2444 measurements

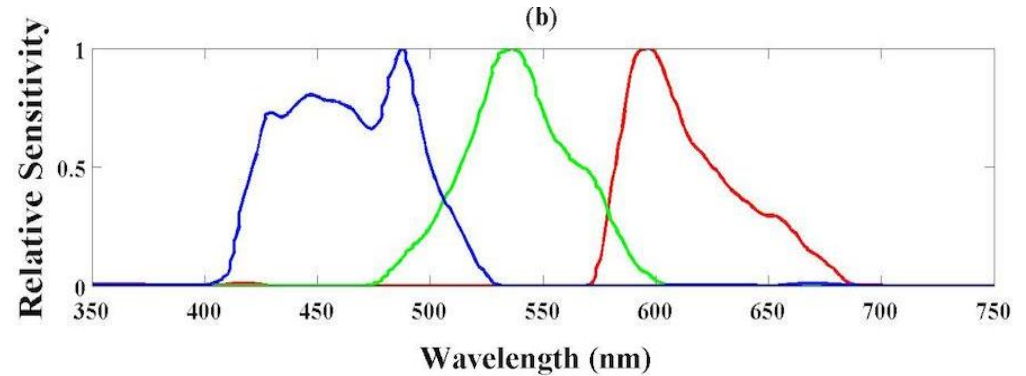
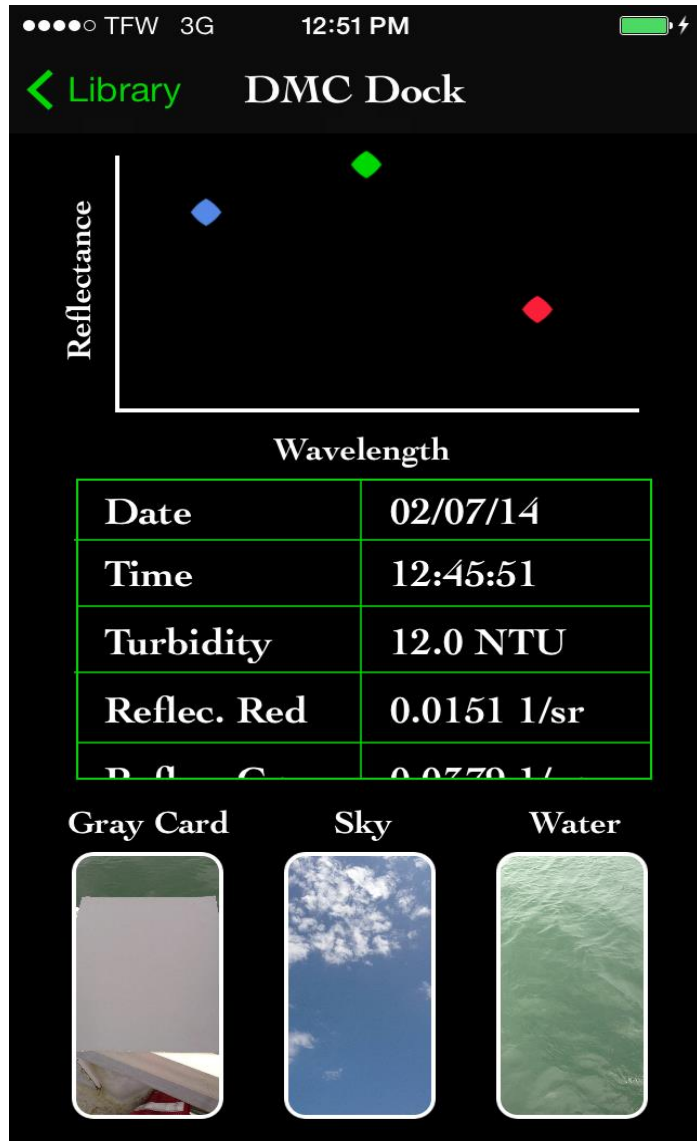
Yielded results on atmospheric conditions and aerosols properties consistent with AERONET & MODIS but at a significantly finer spatial scale.

For more: [GRL article by Snik et al., 2015](#)

Principle: The degree of linear polarization (DoLP) of the cloud-free sky can be measured as a function of wavelength and, by pointing the phone at different directions in the sky, as a function of scattering angle. The DoLP as a function of both wavelength and scattering angle yields unique information on fundamental aerosol properties (concentration, PSD, composition)

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HydroColor (for iOS and Android)



Uses a gray (18%) card to obtain the reflectance in three broad bands (RGB), following Mobley, 1999.

Camera spectral sensitivities are very similar as they try to mimic the human photopic response.

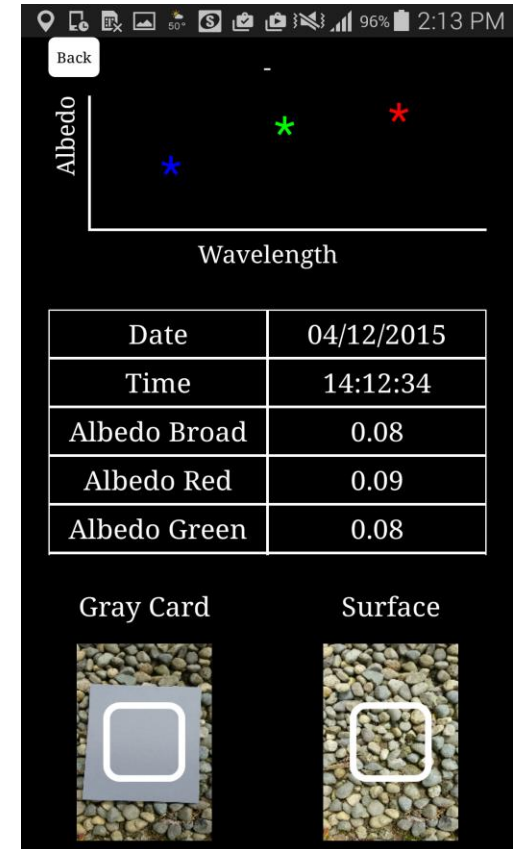
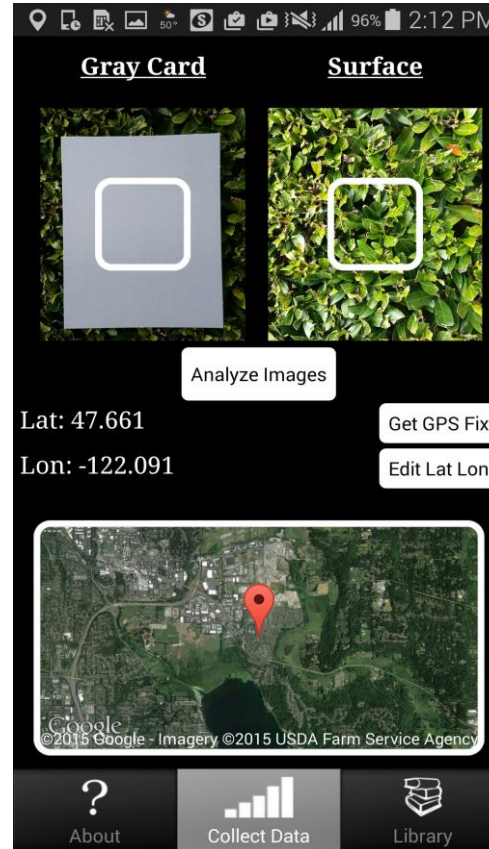
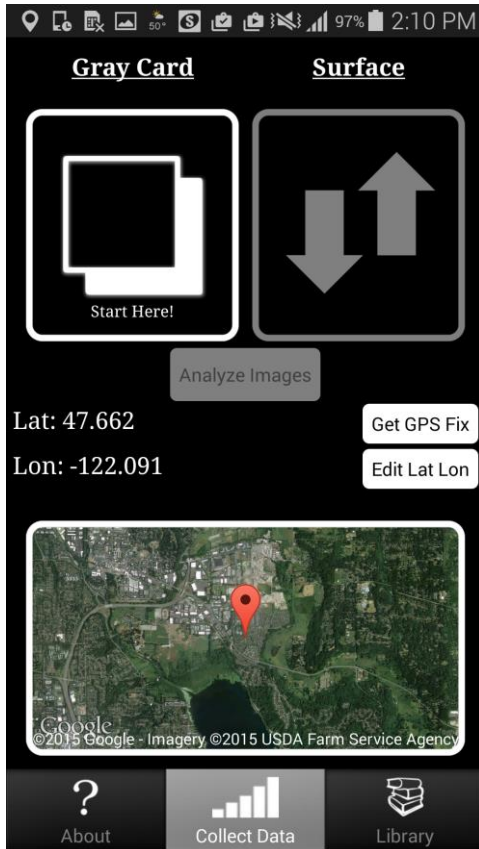
Currently used by citizen scientists in Maine (MVLMP) to monitor lakes and in coastal waters the SF Bay California (USGS).

(Still) Working with Globe.gov to implement a cyber infrastructure.

Playing with the new Albedo App

Using a gray card determine the albedo of a surface.

Make sure surface and gray card are similarly illuminated



How do values compare across different phones and users?