

High-Temporal Resolution Capabilities Discussion

1400 Overview (Joe Salisbury, Wonkook Kim)

1410 Questions (Antonio Mannino, Maria Tzortziou, Chuanmin Hu, ZhongPing Lee, Joe Salisbury)

High-Spatial Resolution Capabilities Discussion

1450 Overview (Arnold Dekker)

1500 Questions (Nima Pahlevan, Joe Ortiz, Chuanmin Hu, ZhongPing Lee, Eric Hochberg)

Combined High-Spatial/High-Temporal Resolution Capabilities

1540 Overview (Maria Tzortziou)

1550 Questions (Arnold Dekker, Nima Pahlevan, Joe Ortiz, Chuanmin Hu, ZhongPing Lee, Eric Hochberg, Joe Salisbury, Antonio Mannino, Wonkook Kim)



What geostationary data brings to the table:

- More data and far less bias in averaging
- Particle and solute dynamics in complex advective regimes (sediments, phytoplankton. pollution)
- Growth and decline of biogeochemical stocks e.g. $\delta_{\text{STOCK}} / \delta\tau$
- Variable illumination and phytoplankton responses



Temporal resolution requirements (From Arnold's Talk)

Within hours: algal blooms, flood events with associated influxes of high nutrient, high coloured dissolved organic matter and suspended sediment loads into reservoirs, estuaries or coastal seas or with tidal or wind driven events.

Within days: pollution events, dredging effects etc.



Discussion notes

What can we presently cannot do with LEO measurements

- Lose dynamics – photoadaptation, diel migration, C stock change over diurnal cycle
- 14-d frequency jeopardizes field validation campaigns
- What is missing in terms carbon cycling? What's the uncertainty from LEO?
- Remove clouds to enable higher frequency measurements
- Lee et al. less accurate PP (up to 40% lower versus Polar)
- Cannot capture nor quantify exchange of tidal wetlands with estuary in terms of C and materials



High spatial resolution: Arnold's overview

- CEOS feasibility study 2018
 - Take aways: spectral and spatial resolution are the core sensor priorities; radiometric resolution and range and temporal resolution needs to be as high as is technologically and financially possible
 - 17 m ideal compromise for global coverage and covering enough lakes, rivers, delta's, estuaries, lagoons, as well as suitable for seagrass, macro-algae and coral reefs



High Spatial resolution: Discussion points

End user requirements are extremely diverse. How to hit the sweet spot of time, space, spectral, radiometric and cost cap.

What is low/medium/high spatial resolution? We have a terminology problem that needs to be defined irrespective of personal bias/expertise

Should a system of EO satellites for aquatic ecosystems all have the same specifications or should we aim for a mix (multi, hyper, fine to medium spatial resolution?)

Algorithms and science data systems to utilize high spatial, temporal and spectral require new/improved algorithms and processing approaches

The community would greatly benefit from a simulated dataset (global, high spatial (SBG?), spectral (SBG?), hourly), which to my knowledge does not exist