

Geostationary ocean colour: application potential in coastal waters

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Terms of Reference

- Interest of GEO orbit for ocean color (OC) science/operational
- Today's situation: space agency mission plans
- Complementarity between GEO and LEO
- Complementarity with other GEO observations
- Potential of GEO-OC sensor for other communities
- Specific requirements of GEO-OC observations?
- Target coastal or global
- Build international cooperation

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Previous ESF working group

[European Science Foundation position paper 12 on "Remote Sensing of Shelf Sea Ecosystems", <http://www.esf.org/research-areas/marine-board/publications.html>]

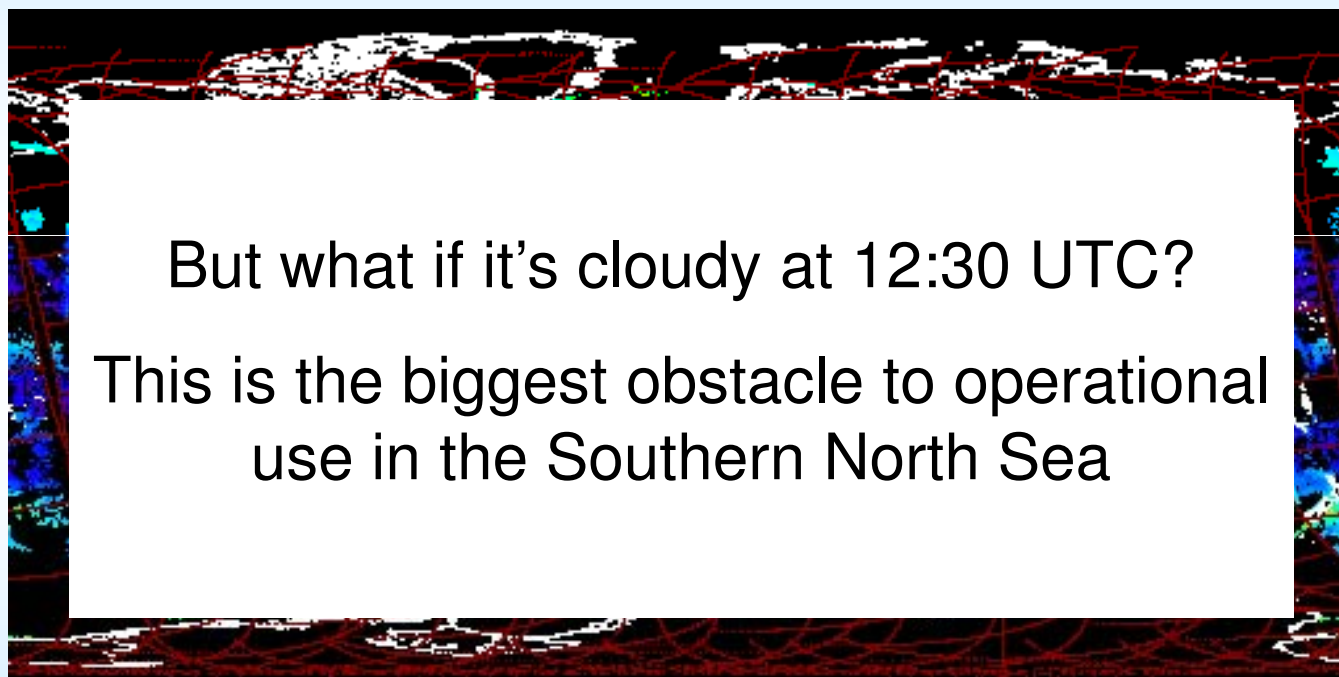
"Geostationary platforms with sufficiently sensitive sensors could offer a **dramatic improvement in the temporal resolution** of data at medium to lower latitudes.

For regions/periods with **frequent scattered clouds** this could mean the difference between a few images per month to a **few (composite) images per week**.

For cloud-free regions/periods it will be possible to follow in hitherto unimaginable detail the **dynamics of phytoplankton blooms**,
and **sediment transport**

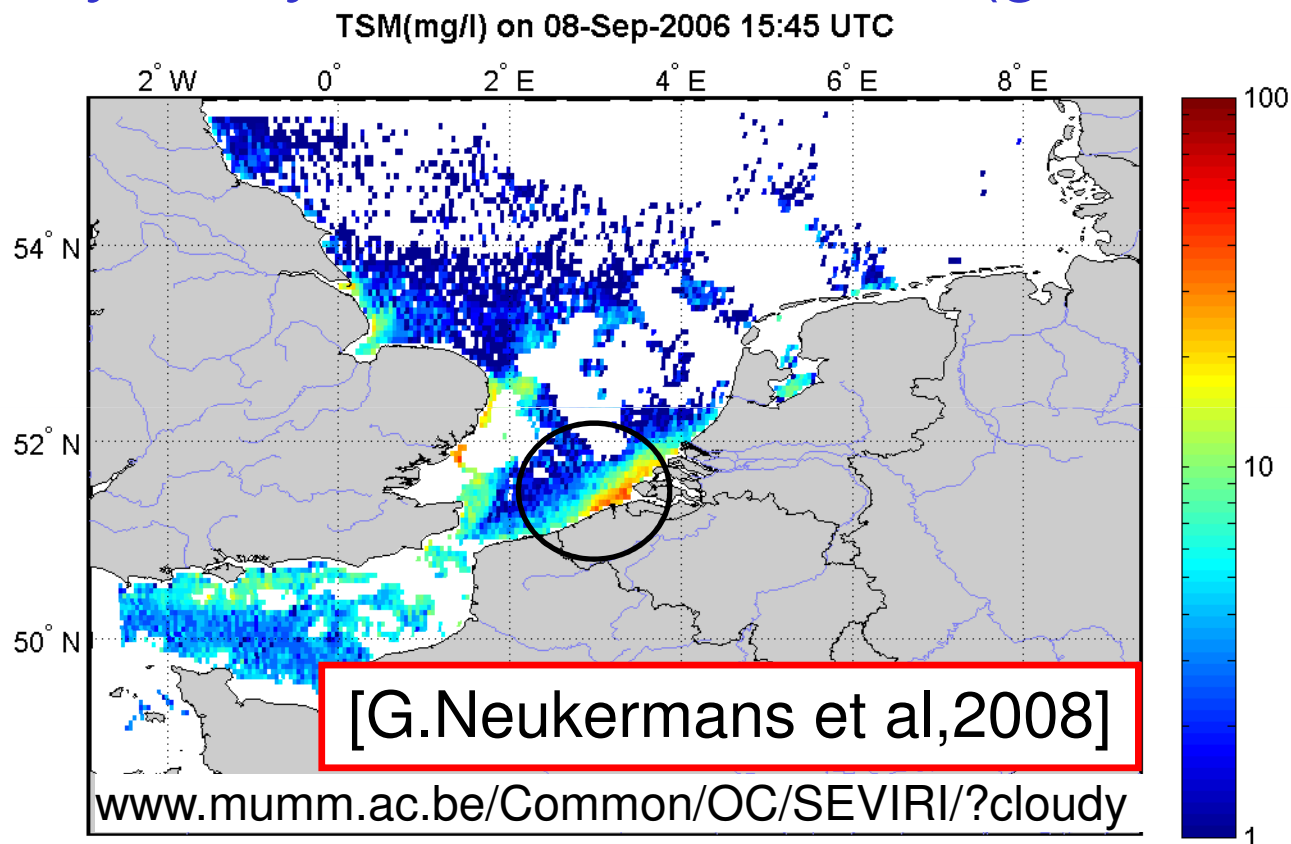
Satellites – polar orbit

- Near-polar, sun synchronous orbit (~700km) for regular global coverage e.g. MODIS-CHL 24.2.2007



- All current ocean colour sensors are in polar orbit: AQUA/TERRA-MODIS, ENVISAT-MERIS, SeaWiFS, ADEOS-POLDER/GLI, etc.

Feasibility study: TSM from SEVIRI (geostationary)



- MODIS cross-validation, HYGEOS improving atmospheric correction
- Can build up daily composite if cloudy (or daily variability if not)
- Constrain atmospheric correction via temporal coherency?

Potential for future geostationary ocean colour

- The feasibility of geostationary sensors for mapping TSM has been established
 - Great advantage over polar-orbiters in cloudy regions (up to 54 °N?) by drastic reduction of scattered cloud problem
 - Only way to capture high frequency variability (e.g. tidal/diurnal)
 - Suggests new ways of ocean colour data processing (temporal coherency of aerosols/TSM/CHL, BRDF analysis?)
- Place left for polar-orbiting sensors?
 - Easier and cheaper to design, build and launch
 - Global coverage including high latitudes, higher spatial res?
 - Cross-validation of GEO
- What about a slightly inclined GEO orbit to cover further North/South of equator [Hong-Rhyong Yoo]?