**Prediction of marine phytoplankton bloom using maritime observatory sensors and spatial remote sensing.**

**Introduction**

In the marine environment, Algal bloom, identified by rapid accumulation and increase concentration of the microalgal population. Blooming which usually occur due to exceed in nutrients, affect the environment and may cause a dramatic depletion from oxygen shortage, reduction in light and excretion of harmful toxins that may affect the whole trophic levels.

Algae can be considered to be blooming at concentrations of hundreds to thousands of cells per milliliter (though concentrations may reach millions of cells per milliliter) or by chlorophyll A measurement higher than …...

Chlorophyll A (chlA) is the main pigment in all photosynthetic organisms and can be used as an indicator of Algae or phytoplankton which can be monitored routinely by sensors of remote sensing. The chlA which excited at 440 nm and emitted light at 680 nm can be measured by spectrometer or fluorometer. These measurements can be indirectly measured as chlA concentration (ug/L). The concentration of chlA per cell can be correlated to cell size but can also be affected by other physiological and environmental factors such as light intensity, nutrients and cell vitality and may be different between organisms.

Phytoplankton growth varies seasonally. In high latitudes, **blooms peak in the spring and summer**, when **sunlight increases** and the relentless **mixing of the water** by winter storms subsides. Different phytoplankton species and genre which are dominant during the year may be affected differently by environmental factors and nutrients.

**Winds** play a strong role in the distribution of phytoplankton because they drive **currents** that cause deep water, loaded with nutrients, to be pulled up to the surface.

In many coastal regions, **southerly winds** cause this coastal upwelling in late summer and autumn. As upwelling brings nutrient-rich water up to the surface, phytoplankton blooms often appear at this time.

The [National Centers for Coastal Ocean Science](http://coastalscience.noaa.gov/) conduct extensive research on harmful algal blooms (HABs). Scientists use a range of technologies to predict where and when HABs are likely to form and how they will affect the areas where they occur (ref)

The East Mediterranean Levant is highly oligotrophic (low in nutrient) and massive blooms are less frequent….however rapid algal growth indeed occurs and understanding the biotic and abiotic factors leading to these extreme growth may be valuable.

As most of marine environment studies, algal blooming models are usually focused on the largescale and try to find correlation to seasonality and major environmental signals. However understanding changes and processes at the microscale levels (hours), may explicit this complicate system and give more precise prediction within few hours to one day, which can be very beneficial for fisherman, swimmers and other.