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Monitoring and prediction of phytoplankton dynamics in the North Sea

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Propositions belonging to the thesis:

“Monitoring and prediction of phytoplankton dynamics in the North Sea”

By **Anouk N. Blauw**

1. Physical mixing and transport processes are important drivers of phytoplankton variability at various time scales (this thesis).
2. Nutrients and light are often good predictors of the spatial and seasonal distribution of total phytoplankton biomass and high biomass algal blooms (this thesis)
3. Understanding of harmful algal bloom dynamics is hampered by the lack of cost effective methods for measuring phytoplankton species composition at high temporal and spatial resolution, particularly for species that are toxic already at low biomass (this thesis).
4. Biweekly to monthly sampling is insufficient for understanding the processes driving algal blooms and changes in phytoplankton abundance (this thesis).
5. Combining monitoring methods with a high temporal and with a high spatial resolution, such as moorings and satellite remote sensing, helps to create a better understanding and predictability of algal bloom dynamics (this thesis).
6. The big data era may therefore yield much better understanding of processes that we can at present only speculate about.
7. While the predictability of phytoplankton in deterministic models is strongly affected by chaos (defined as “sensitive dependence on initial conditions”), in data-driven models sensitive dependence on definitions of model variables strongly affects their predictive power.
8. A quick statistical analysis yields a random pick from a landscape of results that you would get using a set of slightly different approaches; like one member from an ensemble forecast.
9. It does not matter how slowly you go as long as you do not stop (Confucius).
10. Phytoplankton rocks.