

## Data Management Plan for the NSF project OCE-0928819 “**Phytoplankton Traits, Functional Groups and Community Organization: A Synthesis**”

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The project will collect from the literature a diverse set of phytoplankton traits such as nutrient- and light-utilization traits, temperature-related traits, maximum growth rates and cell sizes. For example, for light-related traits we will search the literature for published measurements of growth rate as a function of irradiance, measured on different phytoplankton species. We will collect data from experiments where monotypic cultures were grown without strong nutrient limitation, at least 4 unique irradiances were used, and the cultures were acclimated to the irradiance treatment before growth was measured. For the analyses we will exclude isolates from benthic, epiphytic, and ice environments, in order to focus on pelagic systems. When cell volume is not reported in the original study, when possible we will use a measurement of cell volume from a different study in our dataset that used the same species, or from a different study found in the literature.

We do not plan to exhaustively cross-reference our dataset against recent nomenclatural changes, but for older studies we will update species names such that all studies in the dataset that tested the same species are reported with a consistent name. When a name was changed the name used in the original study will be recorded as a “synonym” in a separate column.

When possible, we will record a strain identifier for each experiment, using an identification code from a large culture collection. Culture collection abbreviations include CCMP (National Center for Marine Algae and Protozoa), SAG (Experimental Phycology and Culture Collection of Algae at the University of Goettingen), CCAP (Culture Collection of Algae and Protozoa), UTEX (The Culture Collection of Algae at the University of Texas at Austin), RCC (Roscoff Culture Collection), NEPCC (Canadian Center for the Culture of Microorganisms), and PCC (Pasteur Culture Collection). A few commonly-studied isolates of *Synechococcus*, *Prochlorococcus*, *Trichodesmium*, and *Emiliana* are listed by the strain name given in the source publication.

To facilitate comparison of traits between taxonomic groups, we will also code each species according to the coarse taxonomic groups often used for phytoplankton. These include chlorophyte, chrysophyte, coccolithophore, cryptomonad, cyanobacteria, desmid, diatom, dinoflagellate, euglenoid, haptophyte (other than coccolithophores), pelagophyte, raphidophyte, and xanthophyte. We will also code whether the species was isolated from a freshwater or marine environment; estuarine species will be coded as marine.

For each trait collected, we will also document the context in which the trait was measured. For example, for nutrient utilization traits we also record, where possible, the temperature, light conditions, preconditioning history, growth medium, cell size, carbon content and the measurement protocol, as trait values are plastic and there are often multiple ways to assess the same parameters.

The collected trait information will be disseminated through supplementary information of our research publications (see below) and through data papers. The trait data collected should be useful for a wide range of researchers for parameterizing biological models, interpreting

phytoplankton distribution and genomic data and predicting phytoplankton community changes in the future.

While we initially planned to create a trait database, our research has shown that a fully operational searchable database is not warranted at present. The number of traits available is small enough to be distributed as data files.

Marine phytoplankton temperature trait data from the publication Thomas MK, CT Kremer\*, CA Klausmeier and E Litchman. 2012. A global pattern of thermal adaptation in marine phytoplankton. **Science** 338: 1085-1088.

Growth rates at different temperatures:

<http://www.sciencemag.org/content/suppl/2012/10/25/science.1224836.DC1/Thomas.SM.table.S6.csv>

Phytoplankton temperature traits and data sources:

<http://www.sciencemag.org/content/suppl/2012/10/25/science.1224836.DC1/Thomas.SM.table.S5.csv>