

INVITED SPEAKERS' ABSTRACTS

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Linking the biology of key species with ocean biogeochemistry

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Comparatively few genera and species of phytoplankton are responsible for the bulk of the primary production in the ocean. The factors selecting dominance of these key species are largely unknown and, in view of the wide range of environmental conditions under which blooms of the same species are commonly encountered, cannot be attributed to physico-chemical conditions, i.e. bottom-up factors, alone. The accumulation rate of cells of a population represents the balance between growth and mortality rates. There is growing evidence that factors regulating mortality rates are responsible for the ultimate size that species populations attain. As natural mortality cannot be replicated under laboratory conditions, detailed studies of ecological processes in the field supplemented by long-term observations and in situ fertilization experiments will be necessary to identify the suite of factors that lead to dominance of one or several species populations over the others. Powerful new methods and instruments enable processes to be addressed at the species level under field conditions. So the species approach to plankton ecology and ocean biogeochemistry is now tractable. Clearly, a better understanding of the ecology and life cycles of such key species will provide the ecological information necessary to model current biogeochemical cycles and provide new biological proxies to interpret the sediment record.