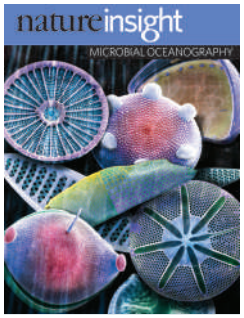

Cover illustration
The silicon structure of the cell walls of various diatom species. (Diatom images courtesy of R. Crawford and F. Hinz. Artwork by N. Spencer.)

MICROBIAL OCEANOGRAPHY

It is now commonly accepted that the world is changing as a result of human activity. The rise in atmospheric carbon dioxide — which increases the amount of CO_2 dissolved in the ocean and reduces the pH of the water — as well as higher temperatures will probably have a detrimental effect on the oceans' ecosystems. To predict future changes, we need to understand the chemistry and biology of the marine world at present.

The smallest but arguably most important inhabitants of the ocean are the microorganisms. These organisms are at the bottom of the marine food web, they outnumber all other marine species by orders of magnitude, and are therefore central to all nutrient cycles. But their small size, the inaccessibility of their habitats, the diversity and interdependence of microbial communities, and our inability to adapt them to life in the laboratory have made them difficult to study.

Advances in large-scale genomic analyses have circumvented some of these problems and have allowed us to determine the composition of microbial communities, as well as their activity at a particular site at a given time. Robotic devices can now also incorporate time series and spatial gradients.

These efforts have provided us with interesting and surprising insights into microbial life in the ocean. In many cases, however, they have also revealed how little is known. This Insight provides a snapshot of today's research efforts in the field of microbial oceanography. It suggests that future work might not only uncover unexpected and unusual species, habitats and interactions, but also help us to understand and respond to the challenges of global change and its effect on human life.

Claudia Lupp, Senior Editor

COMMENTARY

REVIEWS

nature insight