

**For nearly 2 decades researchers have worked to resolve the role of viruses in the ecology of natural systems. Foremost amongst these environments have been the oceans: we now know that viruses are important agents of mortality in aquatic environments. However, we remain in the dark still as to the who, what and when of virus activity. Using molecular tools, we have set forward to study a series of viruses, including the marine giants (the *Mimiviridae*) in their natural habitats in order to begin to shed light on how specific virus-host relationships influence the overall function of aquatic systems.**