



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2003DE25B

**Title:** Characterization of autochthonous viral communities in estuarine waters

**Project Type:** Research

**Focus Categories:** Ecology, Surface Water,

**Keywords:** biodiversity, estuaries, viruses, aquatic communities

**Start Date:** 06/01/2003

**End Date:** 02/28/2004

**Federal Funds:** \$ 1500.00

**Matching Funds:** \$3000.00

**Congressional District:** At large

**Principal Investigators:** Wommack, Eric

**Abstract:** The discovery and later acknowledgement that viruses are the most abundant class of microorganisms in aquatic environments is perhaps the best example of our ignorance as to the true nature of microbial communities. Viruses are now known to be the most abundant life-form within natural waters. In productive estuarine waters typically the abundance of virus-like particles exceeds coexisting bacterial and phytoplankton abundance by greater than 10 fold. In the years since this epiphany, we have learned that in some environments viral infection accounts for a significant proportion of daily bacterial mortality; making viral lysis the most efficient means of transforming biomass into dissolved organic matter. Moreover, as viral infection is generally very host-specific, this process may be important in shaping the composition and diversity of co-existing plankton communities. To date the majority of viroplankton studies have concentrated on methods development; simple enumeration and observational studies; and, to a more limited extent, examination of viroplankton diversity and community structure. In only a few cases, mainly focusing on enumeration, have viroplankton populations been examined in the context of an annual cycle. Noting the general acceptance that viruses are a dynamic component of marine microbial communities, it is surprising that detailed intra-annual observations of viroplankton production, diversity and community structure have never been undertaken. This oversight may be due a previous lack of well founded methodologies for such

examinations. The result of this oversight is ignorance of the extent to which virioplankton activity influences the productivity and diversity of co-existing bacterio- and phytoplankton host communities over annual cycles.

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