**Coliphage as Fecal Indicator Viruses in Recreational Water and Shellfish**

Co-Conveners: Drs. Rachel Noble, Mark Sobsey, and Jill Stewart, UNC Chapel Hill Institute of Marine Sciences and UNC Chapel Hill Gillings School of Global Public Health Department of Environmental Sciences and Engineering

Monday, May 18th, 8:30 am to 4:30 pm, as part of the UNC Water Microbiology Annual Conference at the Friday Center, Chapel Hill, NC

Human pathogenic enteric viruses such as adenovirus, enterovirus, and norovirus, are prominently found in human sewage, and have been identified as important causative agents of gastroenteritis in humans from exposure to contaminated recreational waters and consumption of contaminated shellfish. Human pathogenic enteric viruses have very low infectious doses (as low as 1-10 virus particles), are highly transmissible, and have biochemical characteristics that permit them to persist in coastal receiving waters and shellfish, making these viral pathogens a serious concern. Previous work has suggested that currently utilized fecal indicator bacteria (FIB), such as *E. coli* and Enterococcus, do not adequately predict the presence of human viral pathogens in receiving waters that are contaminated with human sewage, meaning FIB are ineffectual proxies for pathogenic viruses. To date, methodological limitations prevent the desired multiple target viral pathogen analysis that could provide vital information for controlling specific viral pathogens of concern. A range of issues prevent human viral pathogens from being easily and directly quantified in sewage effluent, stormwater, and coastal receiving waters. Coliphage (bacteriophage that infect *E. coli* bacteria) have been previously cited as having potential to be used as fecal indicator viruses (FIV). Coliphage benefit from being quantifiable in a range of water types, and specific subgroups of coliphage (e.g. F+ coliphage) have been identified as having significant relationships to human health outcomes in recent epidemiological studies conducted in Southern California. Based upon the previously raised issues, federal agencies and groups including USEPA, FDA, and ISSC have highlighted possible routes forward to include coliphage in water quality and shellfish harvesting water quality management plans, including the possible development of new coliphage-based criteria for recreational waters, and new regulations regarding shellfish harvesting water closure areas based upon coliphage. This side event is being convened on the topic to accomplish the following objectives:

1) Provide an overview of current activities of federal agencies on the topic of coliphage and coliphage related water quality management strategies,

2) Provide a state of the science review, covering a range of topics of international interest on coliphage, and human enteric viral pathogens,

3) Identify, using a structured, prioritized, and facilitated approach, the existing data gaps to implementing water quality management strategies,

4) Identify short-term and long-term strategies to satisfy data gaps.
Target Audience: All professionals interested in water quality policy development and management in relation to microbial contaminants; including but not limited to federal agency personnel, regulatory agency representatives, wastewater discharge groups, academic scientists and researchers, and environmental consulting groups, including those concerned with wastewater discharge infrastructure, disinfection, and water quality modeling.

Schedule:

8:30 AM: Welcome and Charge to Participants

Policy Review:

8:45 AM: Sharon Nappier, USEPA Office of Water, “Use of Coliphages to Evaluate Ambient Water Quality”

9:10 AM: Ken Moore, Executive Director ISSC, “Utilization of Male Specific Coliphage in the National Shellfish Sanitation Program”

State of the Science Presentations:

9:35 AM: Huw Taylor, University of Brighton, “Application of bacteriophages as indicators of fecal contamination: An update from Europe”

10:00 AM-10:30 Break

10:30 AM: Kati Bell, CDM Smith, “Treatment Systems and Coliphage: State of the Science”

10:50 AM: John Griffith, Southern California Coastal Water Research Project, “Relationship between coliphage and GI illness in swimmers at three California marine beaches”

11:10 am: Panel Discussion, Facilitated by Noble and Blackwood

Panel members: Nappier, Moore, Taylor, Bell, Griffith, Stewart, and Sobsey

12:15 PM: Lunch

1:15-2:30 PM: Facilitated Information Gathering and Advancement of Science (Sobsey and Stewart)

Identifying and prioritizing data gaps according to methods, sources, and water types.

Synergies among agency goals.

BREAK

3:00-4:30 PM: Satisfying Data Gaps and Future Path.