

COMPLETION NOTICE
**SA ¶4(p) Evaluate applicability of NEEAR Great Lakes data
to inland waters (P28)**

Summary of the Study

The study, *Applicability of Great Lakes NEEAR Dataset to Inland Recreational Water Criteria: Summary of Key Studies*, evaluates the applicability of NEEAR Great Lakes data to inland waters and assesses the similarities and differences between coastal freshwaters and inland freshwaters to establish if there are significant differences to justify additional studies to support applicability of criteria to inland waters. In order to conduct the evaluation, EPA reviewed thirteen reports and key peer-reviewed publications pertaining to the establishment of new or revised recreational water quality criteria appropriate to U.S. inland waters. The reports and articles provide (1) overall assessments/evaluations on whether criteria developed on the basis of studies of Great Lakes are applicable to inland waters; (2) findings concerning differences in the microbial ecology, fate, and transport of indicators in inland and Great Lakes waters; and (3) discussions of likely differences in implementing new or revised criteria to inland and Great Lakes, including indicator detection and monitoring schemes. The study also includes information pertaining to coastal marine waters where reviewed materials included such discussions. The study also provides a discussion of current ongoing and future research EPA is pursuing and planning, along with the suggested research provided by each report's authors.

Summary of Findings

Data and health effects relationships developed in the NEEAR epidemiology studies for Great Lakes waters which are primarily affected by publicly owned treatment works (POTW) effluent are generally believed to be applicable to inland waters primarily affected by POTW effluent.

Potential differences between coastal freshwaters and inland freshwaters could be evaluated by the following short-term studies:

- Identify and quantify human pathogens in animal feces
- Examine relationships between qPCR and culture-based FIB
- Optimize and anchor QMRA models to observed health effects data obtained from epidemiology studies and develop QMRA tools for implementation of new recreational water quality criteria.

Findings based on EPA's review of the thirteen reports and key peer-reviewed publications are listed below:

- Fecal pollution source is the main driver of health risk at inland and Great Lakes/coastal sites, before specific setting (e.g. physical and biological processes). This observation is consistent with findings from quantitative microbial risk assessment (QMRA) studies and the limited number of epidemiology studies conducted in both inland and coastal settings and for sites with different fecal pollution sources.
- Application of Great Lakes/coastal water-based criteria to inland recreational waters is expected to result in sporadic, mild illness at rates no higher and probably lower than those experienced in Great Lakes/coastal waters.
- Indicator decay rates fall within comparable ranges between the Great Lakes and inland waters.

- Resuspension mechanics of sediment and soil-associated indicators and pathogens differ for Great Lakes /coastal and inland waters. Resuspension might be more important in inland waters because turbulent shear at the sediment-water interface results in large loads of suspended organisms and particles and because dilution is lower than that of resuspended indicator organisms at Great Lakes/coastal sites.
- For inland waters, the ratio of qPCR counts of indicators to culture counts of indicators likely differs from that typical of Great Lakes/coastal sites because of differences in age of fecal pollution, presence and concentration of chlorinated secondary effluent, and exposure of fecal pollution to solar radiation.

This study has been completed as of December, 15, 2010.