

US EPA ARCHIVE DOCUMENT

2012 Draft Recreational Water Quality Criteria

Public Comments Due February 21, 2012

**Sharon Nappier
USEPA
January 25, 2012**



Water Quality Criteria Recommendations

- Intended to be used by states in adopting water quality standards to protect the designated use of swimming and similar water contact activities.
- Current recommendations are from 1986, and are based on protecting swimmers from exposure to water that contains organisms that indicate the presence of fecal contamination.
 - *E. coli* (freshwater), enterococci (freshwater and marine)
- State water quality standards are used to derive NPDES permit limits, to make listing decisions, to develop Total Maximum Daily Loads (TMDLs) and for beach monitoring and notification programs.

Chronology of Events (1)

- BEACH Act required EPA to conduct studies by October 2003, publish new or revised criteria by October 2005 based on these studies, and review every 5 years.
- In March 2007, EPA convened an Experts Workshop to discuss the state of the science and to obtain input on research needed for the next 2-3 years to develop the scientific foundation for the new criteria.
- In August 2007, EPA developed a *Critical Path Science Plan* identifying research studies to be completed.

Chronology of Events (2)

- In 2008, EPA entered into a Settlement Agreement and Consent Decree to conduct studies in support of criteria development. Many of the studies were from the *Critical Path Science Plan*.
- By December 2010, EPA completed research studies in accordance with Consent Decree and Settlement Agreement.
- Current date for new criteria is October 15, 2012, per Consent Decree.

Stakeholder Engagement (1)

- February 2008 (Washington, D.C.)
 - Introduced purpose, content & status of *Critical Path Science Plan*.
 - Received early input on scope of the criteria.
 - Received early input on inland waters research.
- October 2009 (Chicago, IL)
 - Provided a status update on research.
 - Discussed key elements of criteria -- rapid methods, sources of fecal contamination, and protection of children.

Stakeholder Engagement (2)

- March 2010 (Webinar) – recap of October 2009 meeting
- October 2010 (Webinar)
 - Provided status update on research.
 - Framed main issues associated with new criteria.
- June 2011 (New Orleans, LA)
 - Reported out EPA's research findings.
 - Presented the development of options for overall structure and content of new criteria.
- September 2011 (Webinar) - recap of the June meeting

Historical Perspective on Past Criteria Development (1)

- **1948** – U.S. Public Health Service epi studies found elevated GI illness when mean Total Coliforms exceeded 2300 CFUs/100ml.
- **1976** – EPA published recommendations for Fecal Coliform at 200 CFU/100ml.
 - Based on one water quality study in Ohio, EPA determined that 2300 CFU/100ml Total Coliforms was equivalent to 400 CFU/100ml Fecal Coliforms.
 - A 2X safety factor was applied, resulting in a Fecal Coliform criterion of 200 CFU/100ml
 - At the time, criteria was believed to represent ZERO risk.

Historical Perspective on Past Criteria Development (2)

- **1983/1984** – EPA epi studies determined that associations between GI illness and *E. coli* and enterococci are better indicators than Fecal Coliforms.
- **1986** – Criteria values were developed to be “as protective as” the 200 CFU/100ml Fecal Coliform criteria by maintaining the same water quality.
 - Criteria values were directly calculated by translating Fecal Coliform criteria to the current enterococci and *E. coli* criteria using ratios of observed water quality data from EPA epi studies.
 - Risk levels were THEN estimated using epi curves:
 - 8 Highly Credible Gastrointestinal illnesses (HCGI) /1,000 for freshwaters and 19 HCGI/1,000 for marine waters (assumes GI illness with fever).

Current Thinking (1)

- Recommend 304(a) criteria that apply to all waters.
 - Consistent with 1986 criteria.
 - Encourages consistency, as waters flow between states.
- Recommend culture methods for enterococci and *E.coli* in freshwaters, and enterococci in marine waters.
 - Carry forward the level of water quality protection afforded by 1986 criteria recommendations into 2012 criteria.

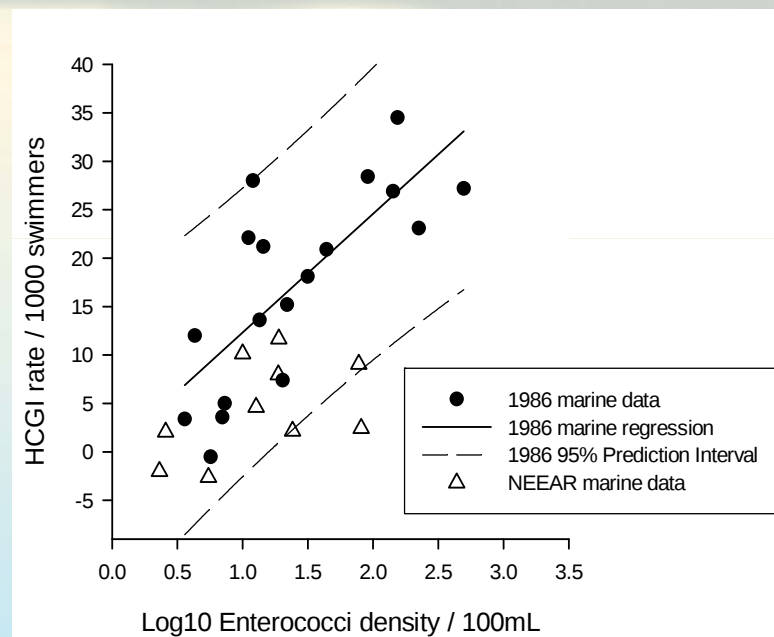
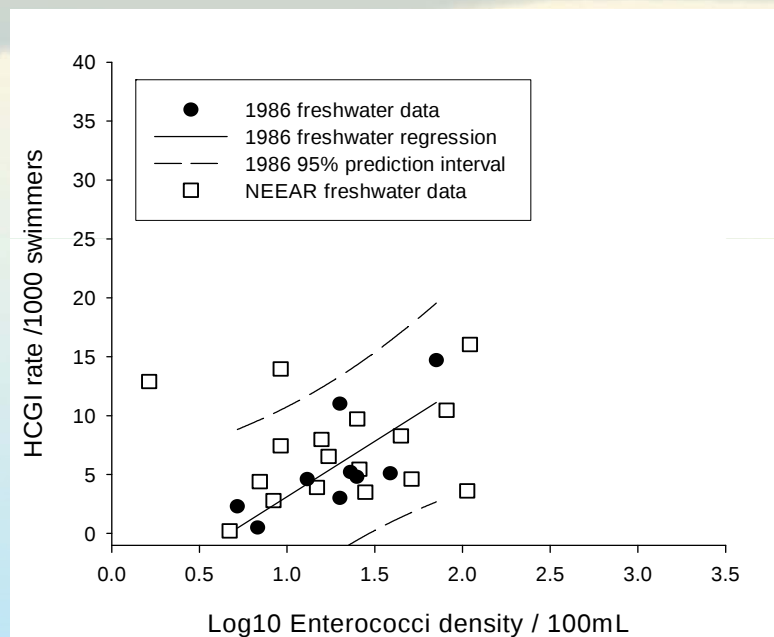
Current Thinking (2)

- Criteria based on studies at POTW-impacted sites.
 - National Epidemiologic and Environmental Assessment of Recreational Water Epidemiology (NEEAR) studies.
 - 4 Freshwater and 3 Marine water
 - Employed new definition of gastrointestinal illness that does not require fever (NEEAR GI or NGI).
 - A factor of 4.5X allows for translating between illness rate definitions.
 - Supported current culture criteria.
 - Provided basis for qPCR site-specific criteria values.

Current Thinking (3)

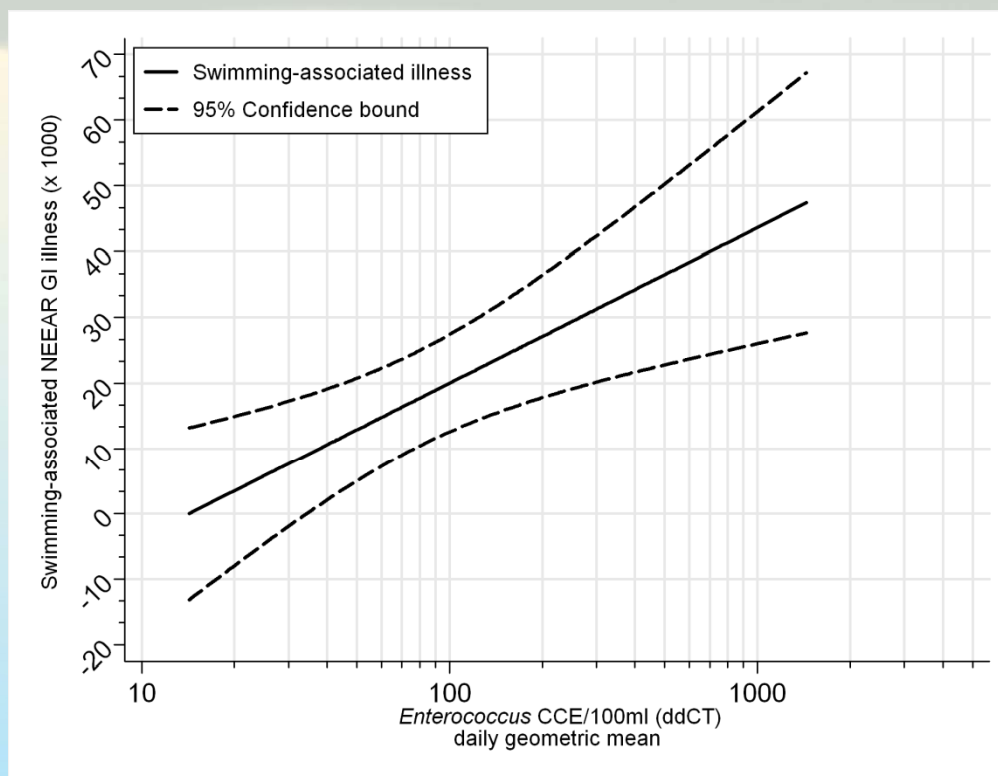
- Criteria supported by EPA and non-EPA studies.
- Used general population epidemiological curve (central tendency of the data).
 - Consistent with 1986 criteria approach.
- NEEAR data allowed for a refinement of illness rate levels associated with water quality.
 - Marine and Freshwater (8 HCGI/1000 swimmers).

Current Thinking (4)



NEEAR studies culture data aggregated by similar water quality and 1986 criteria data for (a) fresh water beaches and (b) marine water beaches.

Current Thinking (5)



Swimming-associated NGI illness and daily average *Enterococcus* qPCR Culturable Cell Equivalents (CCEs)/100ml. All subjects, marine and fresh water beaches combined (Intercept= -0.0273, Slope= 0.02364).

Current Thinking (6)

- Clarify the statistical expression of criteria construct.
 - Maintain Geometric Mean (GM) and an estimated upper percentile value.
 - Statistical Threshold Value (STV) is used instead to avoid confusion with historical applications of the Single Sample Max.
 - Eliminate “use intensity” range for consistency.
 - Identify explicit “magnitude,” “duration” and “frequency” aspects of criteria.
 - Clarify intended use for GM and STV for various CWA programs.

Current Thinking (7)

- Beach Notification:

- Any single sample above the estimated 75th percentile STV should trigger beach notification.

- Other CWA Programs:

- Magnitude: GM and the estimated 75th percentile STV regardless of the sample size.
- Duration: Recommend between 30 days and 90 days.
- Frequency:
 - *GM*: No excursions of the GM over duration specified in WQS.
 - *Estimated 75th percentile STV*: No more than 25% of observations exceed the STV over duration specified in WQS.

Current Thinking (8)

- Tools for site-specific assessment and management of waters:
 - *Enterococcus* qPCR method in freshwater and marine waters for beach monitoring.
 - The qPCR analytical approach offers a faster enumeration of the fecal indicator bacteria.
 - Recommended values are provided to develop site-specific criteria using the qPCR method.
 - Sanitary Surveys
 - Predictive modeling

Current Thinking (9)

- Tools for site-specific criteria derivation:
 - Epidemiology studies
 - Quantitative Microbial Risk Assessment (QMRA) with Sanitary Survey
 - Not able to recommend nationally applicable criteria values for different sources (e.g., gulls).
 - Novel Indicators or New Analytical Methods

2011-2013 Schedule

- Conducted Scientific Peer-Review of Draft Criteria:
 - Summer 2011
- Propose criteria (for scientific reviews) :
 - December 21, 2011 - February 21, 2012
- Sign for publication final criteria:
 - October 2012
- Final Technical Support Materials:
 - December 2013

For More Information

- EPA's Rec Criteria and Beach Web Pages

- <http://water.epa.gov/scitech/swguidance/standards/criteria/health/recreation/index.cfm> New!
 - Draft RWQC
 - Completed Research
 - Experts Scientific Workshop Report and Executive Summary
 - Critical Path Science Plan
 - Criteria Development Plan & Schedule
 - Consent Decree & Settlement Agreement
 - Literature reviews
 - Stakeholder meeting summaries
- http://water.epa.gov/grants_funding/beachgrants/
 - Grants information
 - Beach Guidance Document
 - Local beach information
- <http://water.epa.gov/lawsregs/lawguidance/beachrules/bacteria-rule.cfm>
 - BEACH Act rule
 - Technical fact sheets

To Submit Comments

- Go to <http://www.regulations.gov>
 - Search for EPA-HQ-OW-2011-0466.
 - Click on the ID column to sort the documents numerically.
 - The FR notice is document #0001 and the 2012 draft document is document #0002.

Contact Information

Rec_Criteria@epa.gov