

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.

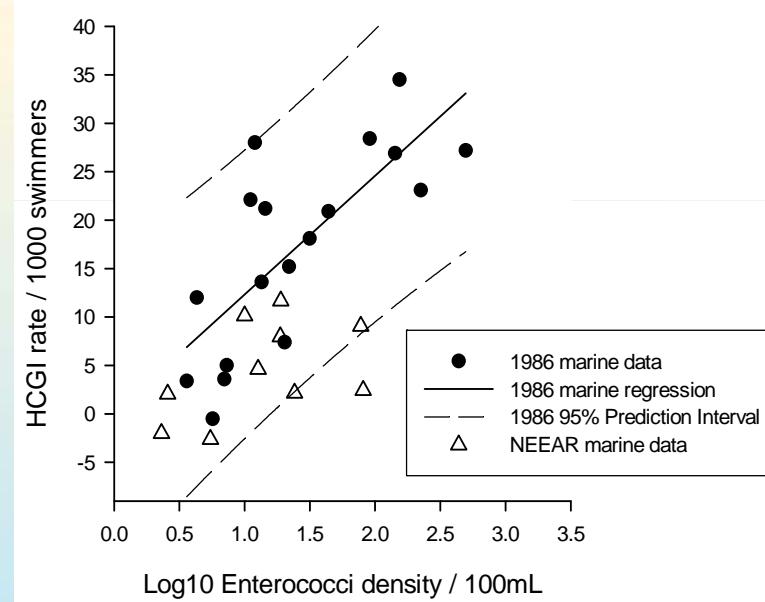
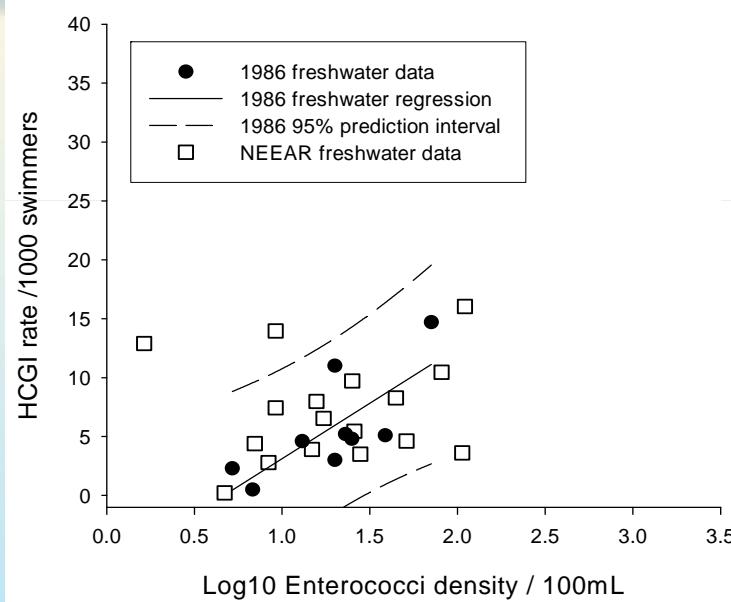
# Current Thinking (2)

- 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)

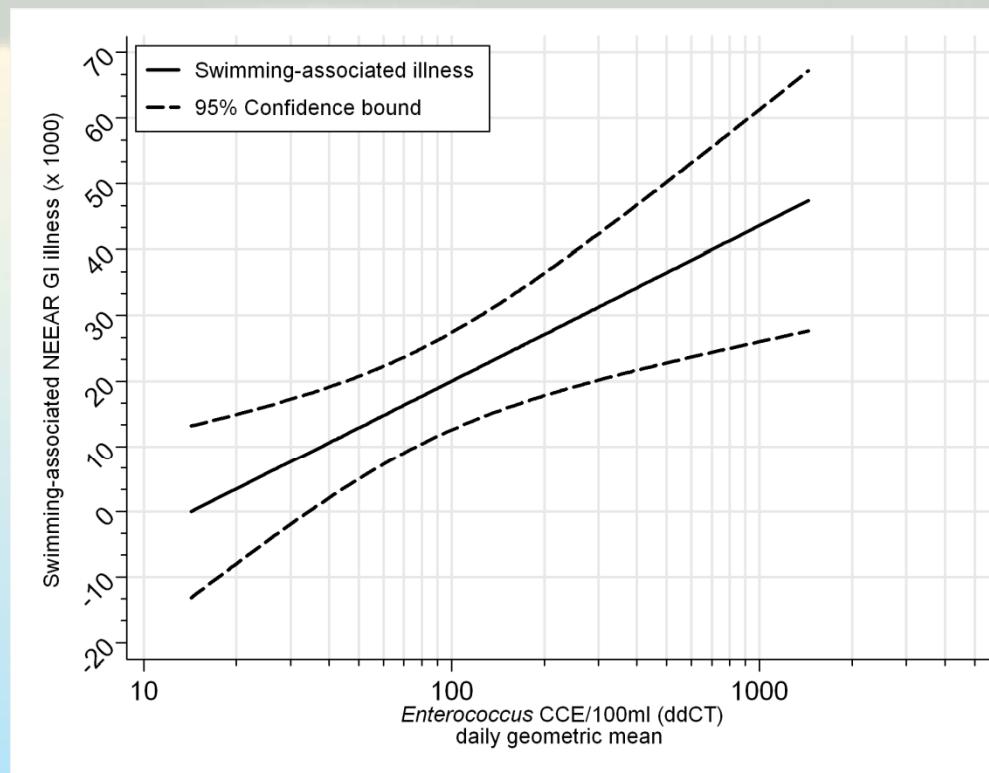
- Criteria supported by EPA and non-EPA studies.
- Used general population epidemiological curve (central tendency of the data).
  - Consistent with 1986 criteria approach.
- NEEAR data allowed for a refinement of illness rate levels associated with water quality.
  - Marine and Freshwater (8 HCGI/1000 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 75<sup>th</sup> percentile STV should trigger beach notification.

- Other CWA Programs:

- Magnitude: GM and the estimated 75<sup>th</sup> 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 75<sup>th</sup> 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/](http://water.epa.gov/grants_funding/beachgrants/)
    - Grants information
    - Beach Guidance Document
    - Local beach information
  - <http://water.epa.gov/lawsregs/lawsguidance/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