



Water Quality Standards

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Clean Water Act

Section 101(a)(2) goal

Waters of the nation suitable for fishing
and swimming by 1983

Water Quality Standards

- Designated uses (e.g., primary contact recreation)
- Criteria to support uses (bacterial indicators)
- Antidegradation statement to protect existing water quality

Previous Studies

- 1968 – NTAC recommendation based on PHS studies in 1940's and 1950's
- 2300 total coliform – measurable GI illness converted to fecal coliform using a 1:5 ratio
- Result – 200 fecal coliform/100 ml of values (geometric mean over 30 days); 400 fecal coliform/100 ml (no more than 10% of samples)
- 1976 – EPA recommended these values

EPA Recommendations -1986

- Revised criteria based on studies with:
 - more intensive sampling;
 - multiple freshwater and saltwater sites;
 - several illnesses surveyed; and,
 - multiple indicators measured in water.

1986 Recommendations - continued

- Criteria based on correlations between illness and indicator density
- *E. coli* (freshwater): 126 cfu/100 ml ($r = 0.8$)
- Enterococci (saltwater): 33 cfu/100 ml ($r = 0.75$)

Risk

- Function of dose/response and exposure
- Risk level - EPA recommends between 8-10 illnesses/1000 swimmers

Control Chart Concept

	geometric mean	single sample	CL
infrequent use	126 cfu/100 ml (<i>E. coli</i>)	575	95%
light use		409	90%
moderate use		298	82%
high use		235	75%

EPA's Current Recommendation

- 1986 criteria
- 25 states have adopted *E. coli* criteria for inland waters
- Beach Act of 2000 – EPA promulgated criteria for marine, estuarine and Great Lakes

Current Activities

■ 2007 Experts Workshop

- representation from states and federal agencies, academia, and public interest groups
- report available from EPA website
<http://www.epa.gov/waterscience/criteria/recreation/>
- report includes recommendations for near-term needs (2-3 years) for research

Current Activities - continued

- Research will support development of new criteria by 2012
 - risk to human health from animal waste
 - indicators of human v. animal waste
 - significance of regrowth
 - new methods for other indicators

Recent Study

- Conducted by EPA's Office of Research and Development
- Used rapid method: less than 2 hour qPCR
- Association of qPCR and gastrointestinal illness confirmed in Great Lakes