

# Measuring Water Ingestion Among Water Recreators

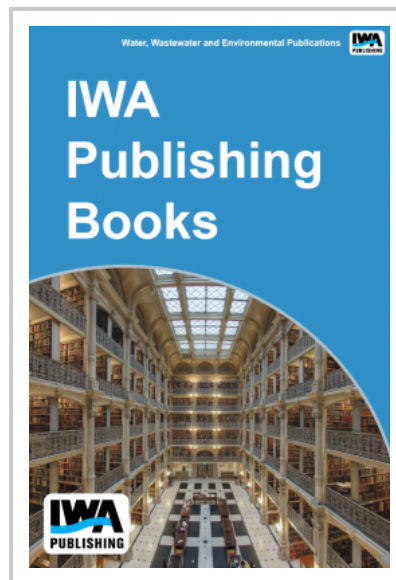
Ambient water quality criteria for recreational waters have been established based on epidemiologic studies of swimmers at beaches. Waters that cannot be used for full contact water recreation (swimming) might support the safe use of limited contact water recreation activities (such as paddling, rowing and fishing). It is not known how the volume of water ingested during full contact activities compares to that during limited contact activities. If that were known, such information could be used to estimate health risk and potentially support the development of site-specific water quality standards to protect the health of “on the water” recreators.

A research team at the University of Illinois at Chicago School of Public Health evaluated rates of water ingestion during a variety of water recreation activities using survey research and environmental chemistry methods. The design of the study was based on work performed by a US EPA research group. Data from 662 participants was used to estimate the occurrence and volume of water ingestion. Despite numerous efforts to optimize method performance, the primary chemical analysis approach for measuring a tracer of pool water (cyanuric acid), high performance liquid chromatography with diode array UV spectrometric detection, generated data that was not of the quality expected. The state-of-the-art measurement technique, high performance liquid chromatography coupled with tandem mass spectrometry was used to estimate translation factors for calculating ingestion volume based on self-reported ingestion information. The translation factors were used to estimate ingestion rates from all study participants.

The results identify three categories of recreational activities based on the occurrence and magnitude of water ingestion. . Swimmers were found to ingest water more frequently and in larger average volumes than canoers and kayakers, who in turn ingestion water more frequently and in larger volumes than those who wade/splash or fish. Canoers and kayakers who do not capsize ingest water about as frequently and in similar volumes to those who fish or wade/splash. Canoers and kayakers who do capsize swallow somewhat less frequently and in reduced volumes compared to swimmers.

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**Publication Date:** 29/06/2011

**ISBN13:** 9781843396192

**eISBN:** 9781843396192

**Pages:** 90

## Print:

**Standard price:** £0 / €0 / \$0

**Member price:** £0 / €0 / \$0

## eBook:

**Standard price:** £28 / €38 / \$50

**Member price:** £21 / €29 / \$38