

## Comment on "Coastal Water Quality Impact of Stormwater Runoff from an Urban Watershed in Southern California"

With interest we read the paper by Ahn (1) et al. concerning the impact of stormwater runoff on coastal water quality in Southern California. We would like to draw attention to similar work that has been done by us and others prior to Ahn et al.'s publication that must have escaped their attention. The data by other scientists in the field, as well as data presented in their own study, do not support the conclusions by Ahn et al.

Ahn et al. compiled descriptive observations over a short two week time period and concluded that surf zone contamination is confined to "a fairly limited stretch of the beach (<5 km around the river outlet)"; however, data from their study (Figure 3) do not support their conclusion. In all four satellite images it is clear that coastal water quality can be impacted for well over 30 km. Interestingly, we investigated exactly the same study site (2) and our detailed statistical analysis of two years of precipitation, river discharge, and coastal water quality data indicate that storm events contaminate beaches over 8 km from the original discharge point—a significant difference. Yet even further, research conducted at the same site by the corresponding author of the Ahn et al. manuscript, also does not support their finding (3); the authors reported pollution from the Santa Ana River as "frequently contaminating >5 km of the surf zone", which is consistent with our work. When considering potential human health impacts from polluted coastal waters, the difference between <5 km and >8 km would affect millions of people who visit Huntington and Newport Beaches, two of the most heavily used beaches in the country. The relationship between stormwater runoff and coastal water contamination in Southern California has also been studied by other researchers as highlighted by two directly relevant papers by Noble et al., 2003 (4), and Ackerman and Weisberg, 2003 (5). As a result of their incomplete literature review, Ahn et al. draw conclusions based on their limited observations that are not supported by other more comprehensive, analytical studies.

The abstract and manuscript of Ahn et al. questions the human health significance of the pollution they witnessed, at times exceeding the water quality standard by 500%. It might be of interest to the authors that their study site was the location of an extensive epidemiologic investigation which documented a direct association between adverse health effects and exposure to contaminated coastal waters, with a significant dose-response relationship (6). Another study conducted a few miles to the north also found a significant human health impact from exposure to urban runoff (7). And further, decades of epidemiological studies conducted around the world have consistently reported a direct and measured dose-response relationship between recreational marine water pollution and risk for a wide range of illnesses. These epidemiology studies have been validated by several meta-analyses (8-11). If the authors are concerned about public health effects from coastal water pollution, we would suggest they review and cite the dearth of literature directly relating to this field.

Given that the majority of the references in this article are from the same research group, we are concerned that the article appears to be an incomplete and a one-sided citation of published research which is a disservice to the field. Absent are references to the large body of research showing the connections between urbanization and increasing pollution levels in associated waterways, and the significant impacts of water pollution on public health. Significantly, the absence of a reference to this groups own previous work begs the question as to redundancy of the current work. With the goal of advancing this field, we encourage the researchers to adequately reflect the current state of research with proper literature analysis.

### Literature Cited

- (1) Ahn, J. H.; Grant, S. B.; Surbeck, C. Q.; Digiacomo, P. M.; Nezhlin, N. P.; Jiang, S. Coastal water quality impact of stormwater runoff from an urban watershed in southern California. *Environ. Sci. Technol.* **2005**, *39*, 5940-5953.
- (2) Dwight, R. H.; Semenza, J. C.; Baker, D. B.; Olson, B. H. Association of urban runoff with coastal water quality in Orange County, California. *J. Environ. Res.* **2002**, *74* (1), 82-90.
- (3) Kim, J. H.; Grant, S. B.; McGee, C. D.; Sanders, B. F.; Largier, J. L. Locating sources of surf zone pollution: A mass budget analysis of fecal indicator bacteria at Huntington Beach, California. *Environ. Sci. Technol.* **2004**, *38*, 2626-2636.
- (4) Noble, R. T.; Weisberg, S. B.; Leecaster, M. K.; McGee, C. D.; Dorsey, J. H.; Vainik, P.; Orozco-Borbon, V. Storm effects on regional beach water quality along the southern California shoreline. *J. Water Health* **2003**, *1* (1), 23-31.
- (5) Ackerman, D.; Weisberg, S. B. Relationship between rainfall and beach bacterial concentrations on Santa Monica Bay beaches. *J. Water Health* **2003**, *1* (2), 85-89.
- (6) Dwight, R. H.; Baker, D. B.; Semenza, J. C.; Olson, B. H. Health effects associated with recreational water use in urban vs rural California. *Am. J. Public Health* **2004**, *94* (4), 565-567.
- (7) Haile, R. W.; Witte, J. S.; Gold, M. The health effects of swimming in ocean water contaminated by storm drain runoff. *Epidemiology* **1999**, *10*, 355.
- (8) Saliba, L. J.; Helmer, R. Health risks associated with pollution of coastal bathing waters. *World Health Statistics Q.* **1990**, *43*, 177.
- (9) Pruss, A. Review of epidemiological studies on health effects from exposure to recreational water. *Int. J. Epidemiol.* **1998**, *27* (1).
- (10) Zmirou, D.; Pena, L.; Ledrans, M.; Letertre, A. Risks associated with the microbiological quality of bodies of fresh and marine water used for recreational purposes: Summary estimates based on published epidemiological studies. *Arch. Environ. Health* **2003**, *58* (11), 703-711.
- (11) Wade, T. J.; Pai, N.; Eisenberg, J. N. S.; Colford, J. M., Jr. Do USEPA water quality guidelines for recreational waters prevent gastrointestinal illnesses? A systematic review and meta-analysis. *Environ. Health Perspect.* **2003**, *111* (8), 1102-1109.

### Ryan H. Dwight\*

Coastal Water Research Group  
Costa Mesa, California 92627

### Jan. C. Semenza

School of Community Health  
Portland State University

ES060553V