

From: robertc@harpub.com [REDACTED]
Sent: Monday, July 09, 2012 3:07 PM
To: Wessel, Ann (ECY)
Subject: formal comment on the proposed Dungeness Water Management Rule

Dr. Robert N. Crittenden
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July 9, 2012

Regarding: Formal Comment on the Proposed Dungeness Water Management Rule

Dear Ann,

Please consider this as a formal comment. Thank you.

Swift's Toewidth Method was used to estimate the flow in the small streams in the Eastern WRIA18, for which there were no stream gage data. However, there were several flaws in how that method was developed and applied, which render it scientifically invalid. There have been more recent studies of the flow in those streams, which may or may not replace the results from Swift's toewidth method. Nevertheless, to the extent that the proposed rule still rests upon the results of that method, that work needs to be replaced with something that is scientifically valid.

Swift's toewidth method and its application contain the following flaws:

1. It was originally developed using stepwise linear regression but there is not indication in their report that they discounted the alpha-levels for multiple comparisons. Although, that is a technical issue, it is a serious mistake. The result is that the model they developed has no scientific support.
2. They selected the rivers and streams they studied instead of randomly sampling them. Consequently, if their method was valid, it would only apply to those particular streams and rivers, rather than to streams and rivers in general.
3. Likewise, they selected the sites on those streams and rivers where they took measurements rather than randomly sampling. Consequently, if their method was valid, it would only apply to those particular sites on those particular streams and rivers, not to those rivers and streams in general.

4. The streams in WRIA18 to which it is being applied have smaller discharges than the rivers and streams for which the method was developed, or are near the limit of that range. The problem is that Swift's toewidth method is an empirical model and, as such, it is appropriate for interpolation within the range of the data from which it was developed. It is not appropriate to use it for extrapolation beyond that range. For this reason, the use of Swift's toewidth method on the small streams in eastern WRIA18 is a misapplication of that method.

5. There is, also, reasonable doubt as to whether the toewidth's that were measured on the small streams in Eastern WRIA18 were meaningful. --- Those streams were altered from their presettlement conditions, with the advent of irrigated agriculture and the draining of wetlands, during the early twentieth century. Later, at the time the measurements were taken for the application of Swift's method, although, agriculture was declining, there was still quite a lot of it, and many of the farmers were still using the older methods of irrigation. Flood irrigation, leakage from the irrigation ditches, and tail-water provided a lot of water for those streams. However, since that time, many of the irrigation ditches have been piped and the older irrigation methods have been replaced by more efficient methods. Furthermore, much of the irrigated agricultural has been replaced by homes. And homes use much less water per acre. The result of these changes is that the measurements that were taken reflect neither pre-settlement conditions nor current conditions.

I am inclined to think that the legal mandate is to maintain the instream conditions that exist at the time that the rule is adopted. In that case, new measurements need to be taken, if, the more recent studies don't serve this purpose.

Sincerely
Dr. Robert N. Crittenden
July 9, 2012