

**Department of Ecology**  
**Fish Consumption Technical Review Meeting**  
**November 5, 2012 | Seattle, WA**

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**Meeting Summary**

On November 5, 2012, Washington State Department of Ecology (Ecology) hosted a technical review panel meeting to discuss the revised version of the Fish Consumption Technical Report V.2.

**List of Attendees**

| <b>Name</b>     | <b>Affiliation</b>                    | <b>Email</b>   |
|-----------------|---------------------------------------|--|
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**Welcome, Introductions and Logistics – Angie Thomson, EnviroIssues**

Angie Thomson, facilitator, started the meeting with introductions and an overview of the meeting goals. Dave Bradley provided a brief background for the Department of Ecology’s Fish Consumption Technical Report Version 2. He noted that Ecology is looking for feedback on how comments were addressed in the revised Technical Report, so the document is robust enough to support policy decisions.

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**Review of Comments Received**

Martha Hankins and Craig McCormack provided an overview of comments received on Version 1 of the Technical Report. Ecology received over 300 public comments on Version 1, and incorporated many of the changes into the revised document

Ecology noted where changes had been made to the Technical Report in response. Among other changes, it was noted that:

- Version 2.0 does not include recommendations on one or more default fish consumption rates.
- Version 2.0 includes the results of an additional evaluation of national fish consumption data. This evaluation was performed using a statistical method developed by the National Cancer Institute.
- Version 2.0 presents additional information from regional fish consumption surveys. In particular, the revised document includes information on the source of fish and shellfish (all fish vs locally-harvested) and species-specific rates.
- Version 2.0 includes fish dietary information from EPA's 2011 Exposure Factors Handbook.
- Version 2.0 includes a discussion of quality control processes associated with academic and tribal population data.

Ecology also provided an overview of the comments received to date on Version 2.0. Around 30 public comments have been received on the revised Technical Report (Version 2). Ecology received comments from businesses, city and county governments, academic organizations and tribal groups. They are available online and are being evaluated by Ecology.

### **Review of Comments Received**

Angie led a round table discussion, asking attendees to describe the key technical issues they have with the Technical Report. During this discussion, it was noted that potentially impacted tribes and some environmental groups are reluctant to participate and were not present at the meeting. Tribes will be moving forward with government-to-government consultations

During the round table discussion, the group discussed the challenge in separating policy choices from technical and scientific determinations. The purpose of having a default fish consumption rate, the importance of analyzing background data and the need for consideration of future conditions (including number of fish consumers, fish consumption rates and sustainability of fish and shellfish resources) and suppression effects were noted. The group also discussed some of the limitations to the nationwide data, given the limited information on temporal variability and that it includes data from all states across the country.

As the round table continued, participants noted the importance of making data available to decision-makers, so they can understand the potential impacts from proposed regulatory decisions. It was noted that the data on fish consumption is incomplete and should include an analysis of the sources of the fish consumed by survey participants. Also discussed was gathering information on where grocery stores receive their fish to help improve the data, as well as making a distinction between finfish and shellfish. A comment was made that policy makers should recognize that it is difficult (if not impossible) to provide equal levels of protection given the varying consumption rates in any given population group.

It was suggested that the summary of issues in the Technical Support Document should include protection for children, employing the precautionary principle given the uncertainties in the science. The need to consider health risks, sustainability, and economic benefits within the context of consumption rates was noted. Some suggested that additional data would be helpful with regard to Washington state fish harvests.

Some people noted that the technical discussion could be more focused if a decision was made about policy direction. However, it was also recognized that the document will be used to inform ongoing policy discussions and decisions.

It was stated that Washington state has more fish consumption surveys than any other state, and those surveys are well done and adequately reflect fish consuming sub-populations. There was discussion around the role of the state in protecting populations with the greatest exposure, such as tribal and subsistence populations, and whether a general population fish survey is necessary.

The need for better defining populations that are considered in the Technical Support Document was discussed. In any given population, there are varying fish consuming habits. It was suggested that the report clarify the assumptions made with regard to sampling and analysis methodology, including for remembered events and rates.

Several people discussed additional analyses that might be conducted on the tribal data. One participant suggested that the tribes may be willing to complete these analyses themselves and provide the results. Additional discussion on methodology and analyses included a conversation about using the 75<sup>th</sup> or 95<sup>th</sup> percent confidence interval and the uncertainty associated with other variables in the calculations for water quality standards. In general, the group suggested that Ecology include an overall statement about the uncertainties surrounding the available data. People also stated that it would be helpful to provide confidence intervals of the data.

The round table discussion concluded with Ecology clarifying that there was a lot of information discussed by the group, and not all of it can be addressed in the Technical Report. Where possible, Ecology would like to include references to other information so the work can be acknowledged without adding significantly to the document.

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## **Technical Issue 1: Review of Current Data**

### **Overview**

Ecology provided an overview of concerns heard regarding the current data, including the lack of access to individual response data. Ecology's position is that the data is credible. Ecology provided some details about several of the data sources:

- The API study was not included in the summary tables because the Kissinger 2005 model cannot be applied across various states. The study of King County API populations included members

from many ethnic groups; however some of the ethnic groups only had a few people, so that extrapolating across the state would not be statistically reliable.

- While the data do not reflect diversity of fish consumption among tribes, populations may be fairly homogenous with respect to where fish are harvested.

### Questions for discussion

- Does the revised Technical Support Document provide a credible and balanced evaluation of the current information on fish consumption rates in the Pacific NW?
- Is the revised Technical Support Document consistent with the weight of scientific evidence on fish consumption rates in the Pacific NW?
- If not, what additional information and/or evaluations should be included?

### Discussion

One theme that emerged during the discussion was that it is important to distinguish between data credibility and data uncertainty. In particular, several people expressed the opinion that available studies are credible, but there are varying degrees of uncertainty surrounding some of the study results. This uncertainty arises in part because the underlying data is not available for independent analyses. People provided several suggestions on how Ecology could acknowledge and address these uncertainties:

- Some participants said that they would be more comfortable with a 75<sup>th</sup> percent interval or a median when discussing distribution, because there is more uncertainty at the tails of the distribution.
- Several people recommended that the report be modified to include a qualitative discussion of the level of uncertainty and how it is reflected in the document.
- One person recommended (and others agreed) that Ecology provide confidence intervals around different the fish consumption rates corresponding to different percentiles of the fish consumption distribution.
- Several people noted that there may not be a need to include additional data, but it is important to keep policy implications in mind when reviewing the data.

The group felt that an additional survey would be a significant undertaking and come with a considerable cost. The group determined that there were questions about sample size throughout the report that need more clarification. Ecology could look to other states for creative ideas (i.e. Florida, Maine and Idaho).

The group discussed that population groups should be more clearly defined in the report, specifically with regard to which populations are being targeted when future policy decisions will be made. Ecology may be able to include some discussion of populations as defined by the Clean Water Act. The group

also suggested the report clarify whether the general population analyzed includes fish consumers only or all members of the public.

During further discussion on populations, the group acknowledged that some of the analyses discussed during the meeting went well beyond the extent of the current data.

Specific comments or suggestions for changes to the report include:

- Remove value statements from the report and clarify assumptions in the statistical analyses.
- Clearly label tables and figures.
- Include a discussion of suppression effects and a margin of safety for human factors.
- Create a graphic to show the changing distribution associated with Table 21.  
Include distribution graphs that were used in Version 1 but omitted in Version 2.
- Include references to other programs and policy frameworks that would interface with this policy (e.g., MTCA).
- Discuss child fish consumption rates in report, given the lack of information about the differences in consumption between children and adults.

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## **Technical Issue 2: Analysis of National Data**

### **Overview**

Ecology provided an overview of how national dietary data had been analyzed, including application of the National Cancer Institute (NCI) methodology to data from the National Health and Nutrition Survey (2003 to 2006). The NCI method is widely used to calculate data for cancer studies. This methodology employs a statistical model to calculate consumption information based on 24-hour dietary recall survey data. Dr. Nayak Polissar described his analysis of data from the NHANES database and the statistical methodology developed by NCI. He explained that the NCI methodology more accurately estimates the consumption rates of episodically consumed foods measured via 24 hour dietary recall surveys.

Ecology noted that Dr. Casey Olives, biostatistician at the University of Washington, reviewed the analysis of the national data. The results of Dr. Olives' review are posted on the Ecology website.

The NCI method was not applied to tribal rates because the tribal surveys used a different approach for measuring consumption, making the NCI methodology not appropriate.

### **Questions for discussion**

- Do the statistical analyses conducted reflect sound biostatistical principles and methods?
- Do the statistical analyses provide technically defensible estimates of national fish consumption rates?

- If not, what methods would you recommend be used to evaluate the national fish consumption data?

## Discussion

Overall, people seemed to believe that the analysis of the national data was consistent with sound biostatistical methods and provides technically defensible estimates of national fish consumption rates. One person stated that he believes the analysis is “cutting edge.” However, people identified several refinements that might be helpful and/or limitations that should be noted in the final technical support document.

- Several people questioned whether the national survey data was representative of Washington State. Researchers have found that people in coastal areas eat more fish than people in the middle of the country. The group discussed that the national survey collected data at 65 locations across the country. As a result, the data cannot be used to conduct detailed analyses of Washington state consumption rates. However, it may be possible to look at data collected from coastal populations to arrive at a coastal consumption rate. This would involve creating a combined population based on coastal areas and develop a rate for that population. There was some question as to whether this approach would be feasible (i.e., would Ecology be able to gain access to the raw data) and meaningful.
- Participants discussed whether the data should be segmented by fish consumers, versus people who do not include fish as part of their diet. This may not change the overall results of the analysis, but could be interesting to examine.
- Participants discussed the application of food frequency data, which was used to exclude data based on what people reported eating, compared to what they actually ate, correcting for recall effects. It was suggested that these people should be included in the analysis because of the uncertainty in the magnitude of these effects.
- Dr. Polissar suggested that in order to ensure the analysis is sound diagnostic measures should be developed to be sure estimates generated by model are appropriate.
- Several people noted that the national data does not report the source of fish consumed, which is a limitation of the data. This should be reflected in the report. The national data also does not separate finfish from shellfish.
- People identified several specific changes to the document, including:
  - Remove the EPA data (NHANES method) from the summary table, and instead only include the more robust national data. The EPA data and analysis should be described in the text but not included in the table.
  - Include the 99<sup>th</sup> percentile for the national data in the summary table.
  - Add more discussion in the report about how data were used, which data may have been excluded, etc.
  - Where possible, provide links to background information that presents detailed methodology or cite information separately.
  - Tables 18, 19, Figures 1 and 2 should include numbers of people.

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## **General discussion**

Several people commented that the list of tasks recommended to supplement the national data analysis seems like a lot of work that may not add significant value. They noted that it is important to be sure the data are robust and correct so as to have a rational backdrop for state policy discussions, but it is also important to use financial resources wisely.

Several people discussed the importance of identifying the appropriate populations to represent fish consumption across the state. Ecology should consider how inclusive it needs to be, and look at how representative populations are. Ecology noted that the methodology used by the Department of Health for use in fish advisories was discussed in the Technical Support Document.

The question was raised as to whether the national and tribal data sets can be combined with a weighting factor to give a more complete view of fish consumption rates. The challenges in using weighting factors were discussed.

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## **Technical Issue 3: Survey Designs and Interpretations**

### **Overview**

Ecology provided an overview of survey designs and interpretations, especially with regard to the credibility of tribal survey data. Ecology stated that tribal surveys are credible and sufficient for calculating rates.

### **Questions for discussion**

- Does the revised Technical Support Document provide a credible and balanced discussion of fish consumption survey designs and interpretation methods?
- Does the information presented in the Technical Support Document include all relevant available fish dietary information for the Pacific NW?
- Is the statistical analysis used to estimate regional fish consumption rates technically defensible?
- Does the revised Technical Support Document (and associated supporting documentation) provide a technically accurate and balanced picture of fish consumption for fish-consuming populations in the Pacific NW?
- If not, what revisions do you believe should be made to the Technical Support Document? Is there additional information that Ecology should consider that would improve the technical credibility and defensibility of the regional-specific fish consumption estimates?

## **Discussion**

The methodology for the statistical analysis of tribal data was discussed. It consisted of estimating the average percent of harvest per species group and then applying those percentages to the consumption rates corresponding to different percentiles of the distribution. There is some concern in the assumptions because it is unlikely that each species group harvested from the Puget Sound is the same. There may also be a small amount of consumption that comes from somewhere other than the Puget Sound, especially if a preferred species with a limited season is consumed.

One person stated that it was important to consider various fish preparation methods, including preserving and smoking. Preparation methods impact temporal patterns of fish consumption (e.g., preserving and smoking can extend the times where seasonal fish are consumed) and overall exposure to contaminants (e.g., smoking increases the levels of PAHs).

Several people expressed concerns about the results of the Suquamish fish dietary survey. It was noted that in general, a 24-hour dietary recall survey will likely reflect the consumption during the survey period but may not reflect daily or seasonal variation. The consumer will tend to over estimate consumption compared to the actual seasonal rate of consumption. It was noted that this is the opposite of what is happening in the Suquamish data (the mean consumption rate measured in the 24-hour recall portion of the survey was less than the consumption rate estimated in the food frequency portion of the survey), and that it would be helpful to see the data more fully described in the Technical Support Document.

Most people stated that the validity of the data is not in question, but would like to see data in more detail to enable a more substantive discussion on this and other topics. One person suggested that it may be possible to use tribal catch records to evaluate whether the surveyed rates are reasonable. Several people noted that there is variability in the data that is difficult to explain. This variability may result from the amount harvested compared to consumption rate, the timing of harvest relative to consumption, elevated consumption during festivals and gatherings, etc. It would be useful to include some discussion in the report around the variability among harvests.

One person offered to get information to the overall group about consumption rates in remote Alaskan regions that are similar to Suquamish, and where researchers have adapted harvest data to generate consumption rates.

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## **General discussion**

Several people expressed the opinion that the tribal data has been taken as far as possible. However, several people also stated that they are still less than satisfied with the tribal data because it is not possible to independently analyze the study data. They stated that this limitation should be acknowledged in the final report. One person recommended that Ecology explore whether it is possible to perform additional evaluations with the data from the Tulalip study.



One person suggested that it might be possible to arrange a time with the tribes to review data on-site. Several participants were uncomfortable with this approach and it was generally agreed that the tribes would not be supportive of this approach. Most participants agreed that it is important to acknowledge and respect the challenges facing tribes.

### **Conclusion**

The group recommended meeting on November 27<sup>th</sup> to talk through any remaining items. If possible, it would be beneficial to have tribal representation at the next meeting. Ecology will communicate with people about a date and agenda for the next meeting. Angie thanked the group for their time and adjourned the meeting.