



**Policy 1-11 Public Dialogue
Data Used in the Assessment
December 2016
Ecology Lead: Patrick Lizon**

Issue #1: Comments on Accountability for the Assessment Process	
Key Issues	Ecology Thinking
<p>Commenters requested development of methodology, and standardized procedures for conducting water (fresh and marine) investigations under the water quality standards. Some commenters also suggested development of additional rules, policies, and guidance to fully implement the Water Quality Data Act.</p>	<p>Ecology is currently developing computer algorithms that will automate the application of numeric water quality criteria and the assessment logic in Policy 1-11 to data from each waterbody assessment unit. This system will help ensure consistency among listings within the water quality assessment. The parameter specific automation logic consists of detailed documentation of how differing types and amounts of data are to be used to make category determinations for the water quality assessment. This documentation has not yet been finalized and is subject to any changes made during the current Policy 1-11 revision process, but we anticipate that once finalized it can be made publicly available (it is basically a set of computer coding instructions that mirrors that narrative provided in Policy 1-11). We believe that the automation logic and Policy 1-11 are adequate for conducting investigations for the Water Quality Assessment. At this time we do not recognize a specific need for developing additional rules, policies, and guidance regarding the Water Quality Data Act, but are open for discussing the perceived need for additional work in this area.</p>
<p>Commenters expressed the need for public access to documentation including data, quality assurance project plans, calibration records, field records, lab analyses, data validation documents, etc.</p>	<p>The majority of other data used in in the assessment is made publicly available in Ecology’s Environmental Information Management (EIM) database. Data from federal agencies not in EIM (such as STORET or NOAA data) is publicly available. Each listing provides information on the source of each dataset. Many older datasets are from hardcopy documents and are available in Ecology’s files. Ecology does not have sufficient resources to fully provide online access to QAPPs, calibration records, field records, lab analyses, and data validation documents; however, when we have these documents in our files, they are available to the public upon request of specific records. Ecology QAPPs are accessible to the public and we have begun to make QAPPs associated with recent Ecology grants available through EIM. We believe public accessibility to data documentation is adequate.</p>

Issue #2: Questions and Comments on Data Representativeness

Key Issues	Ecology Thinking
<p>Age of data used in the Assessment was questioned.</p>	<p>Ecology's current practice is to use data that are less than 10 years old to update the status of any water quality listing. The use of a 10 year assessment window has occurred since we started the 303(d) listing process and is practiced by several other states. In general, once a category determination is established for a listing, new data are needed to update the water quality status. EPA 2006 Integrated Report guidance includes some relevant information relating to the issue of data age:</p> <ul style="list-style-type: none"> • In general, states are required to use all readily available data. • States have the ability to define acceptable data quality, which includes data representativeness, which is affected by data age. • EPA has publically stated that they will not allow de-listing solely based on data age, but that there would have to be conclusive evidence that the old data is in error and/or does not represent current water quality. <p>Ecology believes that using data less than 10 years old to update the status of a waterbody provides a reasonable balance between having sufficient datasets to assess water quality and having data that are representative of current conditions. Another reason that supports the use of a 10 year data window is that it provides overlap with the data window from the prior assessment- this allows for data used in the past assessment to be reassessed (including reevaluating its quality) in the subsequent assessment under a new policy or standards</p> <p>If we changed the data window to 5 years, it is likely that our ability to accurately assess waters would be reduced. This would be particularly true where infrequently monitored waters have data 5-10 years old that may be entirely representative of current conditions. So the effect of shortening the data window would reduce datasets in many cases which conflicts with stakeholder comments that we should be seeking larger datasets (e.g. minimum sample sizes).</p> <p>On a per listing basis, stakeholders can provide to Ecology documentation that a particular dataset is not representative of current conditions and Ecology will consider such documentation in making an impairment determination. Also it is important to consider how the 10 year data window works: during an assessment, if the oldest data qualifies for category 5, but newer data in the assessment period meets the requirement for category 1, then the listing will be placed in category 1.</p>

Key Issues	Ecology Thinking
	<p>Ecology is willing to examine listings that have only pre-2001 data to determine if they qualify for their current listing category under the current water quality standards and assessment policy. Listings that do not qualify for their current category under the current standards and assessment policy would be revised to the appropriate category.</p> <p>All in all, if the goal is to increase the accuracy of 303(d) listings (or de-list old 303(d) listings that are perceived to be invalid), then altering the age of data used in the assessment, requiring minimum sample sizes, and other ways of restricting the use of readily available data will never be as effective as the collection of more current, high quality data. We encourage stakeholders to consider Ecology as a resource in developing and implementing monitoring efforts specifically designed to verify the impairment status of waterbodies.</p> <p>Ecology is open to discussing the age of data used and the data window if stakeholders have additional concerns, ideas or suggestions that they do not believe are appropriately addressed above.</p>
Concerns expressed about representativeness of monitoring stations to listing decisions	<p>In making listing decisions, Ecology uses ambient monitoring data collected from a specific waterbody assessment unit. If a stakeholder believes that the data used in a specific listing is not representative of the ambient conditions, we will explore the issue with them on a per listing basis. Data determined to be unrepresentative for purposes of determining standards compliance will not be used in a listing decision.</p>
Several commenters expressed the importance of identifying "critical periods" for parameters	<p>Ecology is developing the capability to automate the evaluation of data according to critical periods identified in TMDLs. Ecology is open to the use of focal assessment periods for specific parameters and specific designated uses that can be used to guide field monitoring efforts. It is conceivable that focal assessment periods could be identified for all parameters known to vary on a seasonal basis like temperature and fecal bacteria. For example, Ecology could identify June through September as the focal assessment timeframe for evaluating compliance with the core summer salmonid habitat temperature criterion. Critical periods are already incorporated into temperature criteria for supplemental spawning uses.</p>
Stakeholders want to discuss how fish & shellfish advisories and swimming advisories/closures should be used in listing decisions.	<p>Ecology is open to discussing how fish & shellfish advisories and swimming advisories/closures should be used in listing decisions. Currently for bacteria, Policy 1-11 notes that fish, shellfish, and swimming advisories issued by the Department of Health (DOH) or local health departments, or similar advisories from other agencies based on credible monitoring programs under the federal Food and Drug Administration rules or the EPA BEACH Act will be used to directly assess the protection of designated uses. Policy 1-11 does</p>

Key Issues	Ecology Thinking
	<p>recommend when collecting data in or around small sensitive areas such as swimming beaches, that multiple samples be collected throughout the water body during each visit. During peak use, a lake swimming beach may be affected by numerous temporary sources of bacteria associated with human swimmers, including disturbed sediments. When bacteria samples are collected in lake swimming areas without significant water exchange, and it is determined that the swimmers themselves are the primary source of bacterial pollution, this data may be excluded from the Assessment.</p> <p>For toxic pollutants, fish and shellfish advisories issued by the state DOH or by local health departments, or similar advisories from other agencies based on credible monitoring programs under the federal Food and Drug Administration rules, may be used to directly assess a waterbody segment if site specific information and data associated with the specific segment are provided to Ecology.</p>
<p>The policy is not clear on how studies demonstrating adverse effects upon wildlife populations should be used for listing decisions.</p>	<p>Studies that conclusively demonstrate that water quality in a specific assessment unit results in harm to wildlife will be used by Ecology in the Water Quality Assessment. Such studies must conclusively demonstrate a link between the water quality in a waterbody assessment unit and harm to wildlife use in that waterbody assessment unit. For example, if a study demonstrates that concentrations of a toxin in a lake were accumulating within organisms used as food for a particular bird species population and that population was being harmed as a result, then Ecology will place the wildlife use of the lake on the 303(d) list for the pollutant(s) identified. Ecology will not place waterbodies on the 30(d) list if there is no clear linkage between water quality in a specific waterbody and harm to a specific wildlife species. For example, if a study reports that a bird species population living near a specific waterbody is being harmed by a particular toxin, but the study does not show a linkage to the occurrence of that toxin in a specific waterbody, then Ecology will not create a 303(d) listing for impairment of the wildlife designated use by that toxin in that waterbody.</p>

Issue #3: Accuracy and Precision of Impairment Decisions

Key Issues	Ecology Thinking
<p>Policy 1-11 does not clearly explain the application of narrative criteria and its relationship to anti-degradation</p>	<p>Ecology references the state's antidegradation policy (WAC 173-201A-300) in several parts of Policy 1-11, as an application of narrative standards that are used to make listing decisions. Data submitters who believe narrative standards have been violated can submit data and information in accordance with Policy 1-11, "Assessment of Information using Narrative Standards."</p> <p>We do appreciate the suggestion to clarify how antidegradation may apply as a narrative criteria. Our current thinking is that Tier I antidegradation, protection and maintenance of existing and designated uses, is intrinsically applied through the numeric and narrative criteria, which are written such that if you are meeting criteria, Tier I antidegradation is being met. As described in WAC 173-201A-310(2), "No degradation may be allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in this chapter." Information required to make a listing based on narrative standards, including anti-degradation, would need to document both the environmental alteration (degradation) of the waterbody and documentation that the impairment of an existing or designated use is related to the environmental alteration.</p>
<p>More guidance and clarification is needed for addressing the influence of natural conditions</p>	<p>Policy 1-11 includes a section on natural conditions under "7. Other Assessment Considerations." Ecology agrees (and EPA 2006 Integrated Report Guidance endorses) that if a waterbody exceedance is solely due to natural conditions, it does not belong in Category 5 since there are no anthropogenic sources causing the impairment that would require a TMDL or clean up action. Natural condition decisions are made judiciously and must have information sufficient to rule out anthropogenic sources, as described in Policy 1-11.</p> <p>We have had criticisms for not using the natural condition allowance built into the temperature and dissolved oxygen criteria. Ecology lists waterbody segments on the Category 5 list due to temperature or DO impairment when the numeric criteria are exceeded. In most cases, insufficient information exists to determine the level of human influence on temperature for each listed site. This approach assumes that human influences have contributed to the exceedance over the numeric criteria and the increase is measurable over natural conditions. While this approach may list waterbody segments as impaired without fully knowing the extent of the human influences, listings are based on existing and readily available information. In the absence of information, the waterbody segment will remain in Category 5 until further information or data are</p>

Key Issues	Ecology Thinking
	<p>provided to change the category determination. Any information provided through the public call for data that provide validation that human influences can be ruled out and are therefore not contributing to the exceedances will be evaluated. Until Ecology receives information to evaluate, the listings will remain in Category 5.</p> <p>Ecology recognizes that sections regarding natural conditions would benefit from further clarification. If stakeholders have specific areas they would like clarified, we are open to discussion.</p>
<p>Suggestion for having a 2-step listing process for category 5 listings to ensure the validity of the waterbody impairment.</p>	<p>Ecology believes that a 2 step process would need to be parameter specific. If a clear violation of water quality standards has occurred, then the listing should not need to undergo a 2 step-process. The question then becomes how uncertain does a violation need to be in order to refrain from 303(d) listing?</p>
<p>Suggestion for having an appeal period for category 5 listings</p>	<p>There are 2 opportunities for public comment and input on the Assessment:</p> <ol style="list-style-type: none"> 1) Comments and corrections can be submitted during the public review of the draft Assessment, and 2) When Ecology submits the candidate list to EPA for approval, the public can send comments and corrections directly to EPA for consideration. <p>Currently anyone can submit data and information at any point in time that disputes a listing and the list will be corrected as necessary in the following assessment; however, it is rare for Ecology to receive such data and information. Therefore, establishing an exclusive appeal period does not seem necessary. Once the candidate 303(d) list is released, stakeholders may challenge a category 5 listing during the public review period for the proposed 303(d) list or dispute the listing with EPA during the EPA review period that follows.</p>
<p>De-listing procedures need to be better clarified in the listing policy, and considerations should be given to the metrics used to get de-listed (for example with conventional pollutants, single samples can be used to get on Category 5, but continuous monitoring is required to get to Category 1).</p>	<p>Policy 1-11 currently includes information on de-listing for specific parameters. If there are parameters identified where more clarity is needed, we are open to discussing the specificity that people are looking for. We are willing to explore ways in which it may be feasible to use single sample data to support de-listings for conventional pollutant.</p>

Key Issues	Ecology Thinking
<p>More detail is needed to clarify when listings in Category 4A/4 can move to category 1</p>	<p>In 2012 revisions to Policy 1-11, a new section “Assessment within a TMDL Area” was added to provide more clarity on how waterbody segments move from Category 4A to 1. Because this typically involves a TMDL, the assessment of data alone needs to be ground-truthed by TMDL Leads to ensure that the TMDL has been successfully implemented in the location of the waterbody segment. Decisions are largely TMDL-specific and would depend on what allocations and implementation requirements are required in the TMDL.</p> <p>Ecology is open to discussion on areas that stakeholders feel still need further clarification.</p>
<p>There needs to be consistency between data analysis methods and numeric water quality criteria</p>	<p>Ecology is willing to further discuss this issue in upcoming meetings on Policy 1-11. Ecology is currently exploring whether or not improvements can be made to the way we currently evaluate if temperature, dissolved oxygen, and pH are in compliance with the water quality standards. Ecology’s goal is to be as accurate as possible in our listing determinations. Nevertheless, we emphasize that because we have a water quality protection mandate, we believe it is appropriate for a default outcome to err on the side of resource protection when working with sub-optimal datasets that exceed one or more parts of a water quality criterion. For example, sometimes we establish 303(d) listings based on <i>E. coli</i> data even though fecal coliform is the parameter expressed in our numeric recreational criteria. The reason is that <i>E. coli</i> are a fecal coliform, so if <i>E. coli</i> levels exceed the criteria we know that fecal coliform levels can only be at the same level or greater (the reverse of this is that <i>E. coli</i> levels below the criteria cannot be used to determine that the criteria are met, because again, the fecal coliform level will be at or higher than the <i>E. coli</i> level). In this type of case it would be illogical to argue that the use of <i>E. coli</i> data is not consistent with the criteria and therefore should not be used to support a 303(d) listing.</p>
<p>The use of continuous vs. instantaneous data for conventional parameters (temperature, DO, pH) needs to be emphasized.</p>	<p>Ecology is exploring this issue and is open to discussion about how to improve our use of such data. The parameter with the most flexibility is pH because an allowable frequency or duration of exceedance is not specified in the water quality standards; dissolved oxygen and temperature are much more challenging because the criteria have stringent magnitude, frequency, and duration components. Of note, Ecology Environmental Assessment Program staff compared ambient monitoring data for both instantaneous and continuous temperature results and found that although the temperature criteria are expressed as a seven day average daily maximum (7DADMax), a single measurement that exceeds the magnitude part of the criteria almost always predicts that a 7DADMax exceedance has also occurred during the week in which that individual measurement occurred.</p>

Key Issues	Ecology Thinking
Requirements for minimum number of samples	<p>For parameters with numeric criteria, Ecology will not require a minimum number of samples for a data evaluation to occur. The reason is that in many cases it is possible to determine that criteria are not being met even with small datasets. We can be highly confident that the criterion is not being met if a small dataset has a high rate of exceedance. For example, for most parameters it is extremely unlikely that we could randomly collect five samples in a year and find that all five (or even three) exceed the criterion if the actual exceedance rate in the waterbody were very low. Yet we currently have 303(d) listings based on similar situations and by imposing a minimum sample size on the data, we would be overlooking situations in which evidence of impairment is very clear.</p> <p>Furthermore, to not identify such criteria violations due to an arbitrary minimum sample size would result in illogical situations as follows. Assume that the minimum samples size is 10 and 3 exceedances lead to 303(d) listing. A dataset in which 9 out of 9 samples were exceedances would not be 303(d) listed even though the value of the 10th sample, if collected, would be meaningless, while a dataset in which 3 out of 10 samples were exceedances would lead to a 303(d) listing. Requiring a minimum number of samples would not make impairment decisions more accurate, although it would certainly make the development of the assessment much easier.</p> <p>Ecology will consider restructuring the Category 5 requirements for specific parameters in ways that align with how the criteria are written in the standards. Some parameters include frequency limits while others don't. Those that don't allow more flexibility in how we determine impairment.</p>
The statistical level of confidence in 303(d) listing decisions: what are the Type I and II error rates for ECY's current assessment methods?	<p>Ecology has been exploring the issue of error rates for conventional parameters (i.e. temperature, DO, pH) and has developed an error analysis paper that is available on our website. Ecology is willing to discuss the flexibility we have and alternative approaches for determining whether or not observed temperature, DO, and pH values meet water quality criteria. As we discuss this issue, the underlying assumptions need to be clearly expressed because different assumptions can lead to vastly different conclusions about the prevailing error rates in Ecology's current assessment methodology. For example, if one assumes that a waterbody can violate a water quality criterion 10% of the time, then the Type I error rate for Ecology's current temperature, oxygen, and pH becomes very high above 12 or so samples. If one assumes that no true exceedances of a water quality criterion are "allowable" then the Type I error rates are extremely low.</p>

Key Issues	Ecology Thinking
<p>“Listing” vs. “de-listing”: why is it easier to conclude impairment than non-impairment?</p>	<p>Ecology is open to discussion and exploration of additional pathways for de-listing, but we will not make listing and de-listing requirements equal (see Ecology’s Error Analysis document, Appendix 2). In Washington State the decision is not just between placement of the listing in either Category 1 or Category 5. Other categories, such as 2 (waters of concern) or 3 (insufficient data) may also be used when the data is not conclusive.</p> <p>Once a waterbody is known to be impaired, a high level of confidence is needed to that conclude the waterbody is subsequently meeting criteria in order to de-list the waterbody. Therefore a greater amount of data is needed to achieve a high level of confidence that the criteria are consistently being met.</p> <p>There is flexibility in dealing with bacteria because the criteria have no specific frequency component. For example, for bacteria category 1 determinations we could require a minimum of five samples in a critical period in each of the two most recent years of data instead of 10 samples in the most recent year. For category 5 decisions we may be able to require: a minimum of two exceedances in a given season; two exceedances in a given year; or perhaps at least one exceedance in two or more years in order to address whether or not the violation is persistent.</p>
<p>How representative are single grab samples of averaging periods specified in toxics criteria (e.g. 4-day average)?</p>	<p>This issue is addressed in Ecology’s Error Analysis document, Appendix 3, posted on the website.</p> <p>Ecology is open to discussion of potential alternatives to our current treatment of this issue that will continue to consider single grab samples in assessing data for compliance with the criteria (but may also increase the accuracy of our 303(d) listings). EPA 2006 Guidance on the Integrated Report discusses the use of data where target data quantity expectations are not met, but the available data and information indicate a reasonable likelihood of a criteria exceedance (e.g., available samples with major digressions from the criterion concentration, corroborating evidence from independent lines of evidence such as biosurveys or incidence of waterborne disease, or indications that conditions in the waterbody and loadings of the pollutant into the waterbody have remained fairly stable over the period in question).</p>