2014 Water Quality Assessment Process

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INTRODUCTION

The water quality assessment process is a framework used by the North Carolina Division of Water Quality to interpret data and information to determine whether a waterbody is meeting water quality standards. This framework is critical to providing a balanced and consistent comparison of data and information with North Carolina water quality standards.

This document is intended to be a comprehensive description of NC's water quality assessment process for Clean Water Act Section 305(b) and 303(d) purposes.

WATER QUALITY ASSESSMENT

The assessment of a waterbody requires water quality data, water quality criteria to compare the data to, and the assessment methodology to make decisions on whether the waterbody meets criteria. Through the assessment process DWQ assigns each waterbody to a category. Categories represent levels of water quality criteria attainment, ranging from Category 1, where the monitored parameter meets water quality criteria, to Category 5, where a waterbody exceeds water quality criteria and a TMDL or other reduction plan is required to address the pollutant of interest. Categories are based on EPA guidance.

WATER QUALITY STANDARDS AND CLASSIFICATIONS

Water quality standards are an integral part of water quality assessment. Water quality standards are state regulations that form the foundation of controls that protect lakes, rivers, streams and other waterbodies from pollution. These rules must be approved by the US Environmental Protection Agency to ensure compliance with the Clean Water Act. The rules are in Title 15A of the North Carolina Administrative Code (NCAC; http://portal.ncdenr.org/web/wq/ps/csu/rules). These rules include:

1. Beneficial use designations (classifications) (*e.g.,* recreation, water supply, aquatic life)
2. Numeric levels and narrative statements (water quality criteria) protective of the use designations.

Under the Clean Water Act, states must review their water quality standards and classifications every three years and make any modifications necessary to meet federal requirements and to protect waters of the state. This process is known as the Triennial Review.

Surface water classifications are designations applied to surface water bodies, such as streams, rivers and lakes, which define the best uses to be protected within these waters, and carry with them an associated set of water quality criteria to protect those uses. Surface water classifications are one tool that state and federal agencies use to manage and protect all streams, rivers, lakes, and other surface waters in North Carolina. Each classification has associated criteria that are used to determine if the designated uses are being protected.

For detailed information on Water Quality Standards and Classifications please visit http://portal.ncdenr.org/web/wq/ps/csu.

CLEAN WATER ACT SECTIONS 305(B) AND 303(D)

The 305(b) report and 303(d) list are products of the water quality assessment. Under federal law and regulation, States must perform a water quality assessment every two years and report results to EPA. The 305(b) report is a list of all waters in the state with associated integrated reporting categories (1-5) and other pertinent information relating to each waterbody.

The 303(d) list is part of the 305(b) report. The 303(d) list is a list of waters that exceed water quality criteria, as determined through the 303(d) listing methodology approved by the NC Environmental Management Commission, along with any waters added by EPA. The name of the list comes from Section 303(d) of the federal Clean Water Act (CWA), which requires States to identify and establish a priority ranking for waterbodies for which existing controls are not stringent enough to attain and maintain applicable water quality standards, and to establish total maximum daily loads (TMDLs) for the pollutants responsible.

RESULTS OF 303(D) LISTING

NPDES WASTEWATER permit holders can typically maintain their current loading of a pollutant into a water on the 303(d) list for that pollutant until a TMDL or management strategy is developed, but they may not increase that loading, per state and federal regulations (15A NCAC 02B .0404 (a) and 40 CFR 122.4(i)). For example, they may increase flow, but must decrease concentration to maintain current load.

NC DWQ and others use the 303(d) list to prioritize waters for restoration and other follow-up action such as additional monitoring. As part of federal grant commitments, DWQ staff must develop some number of TMDLs per year based on negotiations with EPA.

FUNDING SOURCES prioritize resources to restore NC waters on the 303(d) list. Such sources include Clean Water Management Trust Fund, Section 319 grants, State revolving fund, Ecosystem Enhancement Program, US Natural Resources Conservation Service Water Quality Initiative, and state agriculture cost share. These programs provide millions of dollars to address 303(d)-listed waters.

"DE-LISTING"

Each list is an update of the previous list, i.e., lists are not created from scratch each time. States must demonstrate good cause for not continuing to include waters on the list (40 CFR 130.7; http://www.gpo.gov/fdsys/pkg/CFR-2011-title40-vol22/pdf/CFR-2011-title40-vol22-sec130-7.pdf).

The following are considered good cause justifications: more recent data meets criteria; TMDL approved; other requirements in place; natural conditions documentation; flaws in the original assessment; or a new 303(d) listing methodology, consistent with the State water quality standards and federal requirements, that concludes that a water meets criteria.

TMDLS

The TMDL development process includes a study of the watershed to identify the sources of the pollutant of interest, and calculations or modeling to identify the pollutant contributions and reductions needed from point and nonpoint sources. An implementation plan recommending sources of assistance or funding to help with water quality improvements may be included with the TMDL, but is not required by federal law or regulation.

If an NPDES wastewater discharge is found to be a contributor of the pollutant, the discharger will be given an allocation based on the TMDL wasteload allocation. This allocation may or may not represent reductions in the pollutant depending on the significance of the contribution.

If criteria exceedances occur within or downstream of an NPDES Phase I or II stormwater jurisdiction, and the pollutant has a clear relationship with stormwater, then reductions required from the jurisdiction will be included in the TMDL. Such permittees are given time to write and implement a stormwater improvement plan, which is included as part of the stormwater permit.

More information on the TMDL process and requirements can be found at http://portal.ncdenr.org/web/wq/ps/mtu/tmdl

303(D) LIST AND ASSESSMENT METHODOLOGY PUBLIC COMMENT

The public will have an opportunity to review the entire water quality assessment process in the summer of even-numbered years prior to the assessment in the following odd-numbered year. The NC Environmental Management Commission will review and approve the 303(d) listing methodology before it is applied. A public review of the draft 303(d) list itself will continue to occur in the months before the list is submitted to the Environmental Protection Agency for approval.

EPA APPROVAL OF THE 303(D) LIST

Current federal rules require States to submit 303(d) lists every two years, by April 1st of every even numbered year. EPA is required to approve or disapprove the state-developed 303(d) list. EPA does not approve the 305(b) report or the assessment methodology.

Because 303(d) is a federal program under the Clean Water Act, EPA has final authority on the 303(d) list. EPA reviews the state-submitted 303(d) list. EPA will then ensure the list has identified all waterbodies that exceed criteria. EPA identifies additional waters that should be included on the list.

I. USES AND ASSESSMENT

Water quality standards are the foundation of the water quality-based pollution control program mandated by the federal Clean Water Act. Water quality standards define the goals for a waterbody by designating its uses and setting criteria to protect those uses. There are five general water quality uses identified in North Carolina: aquatic life, recreation, fish consumption, water supply, and shellfish harvesting. To fully assess these "uses" would require extensive study and data

collection for each waterbody and each use. Instead, the criteria developed to protect the uses are applied to assess attainment of standards.

For the 2014 assessment the terms Exceeding Criteria, Meeting Criteria, Inconclusive Data, and No Data will be used when assigning waters/pollutants to the assessment categories described below.

II. DATA USED FOR ASSESSMENT

Typically, a five-year dataset is assessed. For 2012, most data were collected between 2006 and 2010. Most data used in the assessment process is collected by DWQ and monitoring coalitions. Anyone can submit data for DWQ's consideration at any time. The Modeling and TMDL unit will send out periodic notifications through its listserv on data submittal deadlines for the upcoming 303(d) list.

The detailed data submittal process can be found here. http://portal.ncdenr.org/web/wq/ps/mtu/assessment#4. DWQ always prefers to discuss monitoring programs with outside agencies prior to spending resources so that both parties are in agreement on expectations of data use and timing.

III. ASSESSMENT UNIT DELINEATION

The base dataset for assessment units is the USGS 1:100,000 scale hydrography or the map of named streams in NC. NC has augmented this by adding some of the many unnamed streams from the 1:24,000 (more detailed stream map) scale hydrography. Although this dataset does not include all mapped waters it generally covers waters where NC has been able to monitor. Since the 1950's NC has been classifying streams for various uses. In NC there are currently about 12,300 named and classified segments. The assessment units (AUs) are the same as the classified named waters except that some of them are resegmented into smaller units because of different types of data, assessment results, or drainage area characteristics (e.g., major tributaries, land use changes). There are currently 13,181 AUs. In general, assessments are usually applied only to the AU where the data are collected with minimal extrapolation. For implementation purposes all activities in AUs in the entire upstream drainage area could be subject to management measures or TMDLs to address identified criteria exceedances (Category 4 or 5 assessments). NC looks for public comment during 303(d) review periods on how large or small to make the AU delineations.

There are four units of measure used for AUs: Freshwater Acres for reservoirs, Freshwater Miles for flowing streams, Saltwater Acres for estuarine waters, and the 320 miles of Atlantic Coastline. The average size for an estuarine AU is 1,257 acres. The average size of a reservoir AU is 1,023 acres. The average size of a flowing stream AU is 3.5 miles. NC generally summarizes assessments using counts of AUs instead of lengths or areas.

IV. DETERMINING INTEGRATED REPORTING CATEGORIES FOR WATER QUALITY ASSESSMENTS

NC assigns individual water quality assessments in four categories (1, 3, 4, and 5), based on EPA guidance. Category 2 is not used for individual assessments. For each Assessment Unit (AU), available water quality data for each parameter are compared to the criteria for that parameter. Assigning categories to water quality assessments assists in data management and coordination at the local, state and federal levels. The categories also provide an easy way to query and display data in databases and with GIS. NC has modified these categories and added sub-categories beyond EPA guidance to help clarify assessments. *There may be multiple assessments meeting criteria and multiple assessments exceeding criteria for any individual AU.* The total number of assessments for a given AU depends on the amount of available data for that AU. There is no overall "use" assessment made for aquatic life, recreation, fish consumption, water supply, or shellfish harvesting uses.

Appendix B summarizes 2012 assessments.

A. CATEGORY 1- ASSESSED PARAMETER MEETING CRITERIA

CATEGORY 1 ASSESSMENTS are assigned when a parameter is meeting criteria.

CATEGORY 1B ASSESSMENTS are assigned when a parameter is meeting criteria and there is a management strategy (not a TMDL) in place for that parameter. The management strategy remains in place to ensure that criteria are maintained.

CATEGORY 1NC ASSESSMENTS are assigned when a parameter has been found to be exceeding criteria but it has been demonstrated to be a natural condition. Currently North Caronlina uses this assessment category where there is documentation that low DO and low pH criteria exceedances in coastal plain streams are due to natural conditions in swamp and swamp-like waters. This type of assessment is discussed in detail below for dissolved oxygen and pH.

CATEGORY 1T ASSESSMENTS are assigned when a parameter is meeting criteria and there is an approved TMDL in place for that parameter. The TMDL remains in place to ensure that criteria are maintained.

B. CATEGORY 3- UNABLE TO DETERMINE IF MEETING OR EXCEEDING CRITERIA

CATEGORY 3A ASSESSMENTS are assigned in several different cases where data are insufficient to determine if a parameter is meeting or exceeding criteria. The most common example occurs when a biological sample is Not Rated because biocriteria have not been developed for the site or because the sample was collected during extreme conditions such as drought. Category 3a assessments are also commonly assigned when the preferred minimum number of samples (N>9) were not collected during the five-year data window. Category 3a assessments are also used when data have not been collected to assess fecal coliform bacteria, i.e., data do not meet the 5 samples in 30 days requirement needed to determine if this parameter is meeting or exceeding criteria. Category 3a is also used when greater than or equal to 10% of samples exceed criteria with less than 90% confidence, and there is no approved TMDL. Category 3a has been used extensively

where there were exceedances of DO and pH criteria in swamp and swamp-like waters instead of assessing directly into Category 5.

CATEGORY 3B ASSESSMENTS are assigned when greater than or equal to 10% of samples exceed criteria with less than 90% confidence, and there is a management strategy (not a TMDL) in place for that parameter. The management strategy remains in place to ensure that criteria are ultimately attained.

CATEGORY 3T ASSESSMENTS are assigned when data were insufficient or there were no instream data to make an assessment, and there is an approved TMDL in place for that parameter. These assessments are associated with TMDLs that do not have current data or instream data to assess the parameter. Category 3t is also used when greater than or equal to 10% of samples exceed criteria with less than 90% confidence, and there is an approved TMDL in place for that parameter. The TMDL remains in place to ensure that criteria are ultimately attained.

C. CATEGORY 4- EXCEEDING CRITERIA & TMDL NOT REQUIRED

CATEGORY 4B ASSESSMENTS are assigned when a parameter exceeded criteria and there is an enforceable management strategy in place for that parameter. Most of these were Category 5 assessments prior to management strategy development. A TMDL is not required for parameters assessed in Category 4b.

CATEGORY 4C ASSESSMENTS are assigned when a parameter exceeded criteria due to the presence of a water control structure such as a dam. In such cases where there is no identifiable pollutant, a TMDL is not required. A biological assessment exceeding criteria just downstream of an impoundment is an example of Category 4c.

CATEGORY 4CR ASSESSMENTS were assigned only for beach swimming areas where Division of Marine Fisheries Recreational Water Quality Monitoring had posted "Swimming Advisories" and there were not enterrococcus data available to make an assessment of the pathogen criteria. A TMDL is not required for parameters assessed in Category 4cr.

CATEGORY 4S ASSESSMENTS were assigned when biological integrity (fish or benthic community samples) were exceeding criteria but there was another aquatic life parameter with a Category 4t or Category 5 assessment. TMDLs will be developed for the Category 5 assessments.

CATEGORY 4T ASSESSMENTS were assigned when a parameter exceeded criteria and there is an approved TMDL in place for that parameter. Prior to TMDL development these were Category 5 assessments.

CATEGORY 4V ASSESSMENTS were assigned when a parameter exceeded criteria and there is a variance in place for that parameter. A variance from a water quality standard provides an NPDES permittee with a period of relief when the permittee cannot immediately comply with a water quality-based effluent limit. Variances are reviewed on a triennial basis along with the rest of a State's water quality standards.

D. CATEGORY 5- EXCEEDING CRITERIA & TMDL REQUIRED (303(D) LIST)

CATEGORY 5 ASSESSMENTS are assigned when a parameter exceeded criteria and requires development of a TMDL. **Category 5 assessments are the 303(d) list**. States are required to submit Category 5 assessments to EPA on April 1st of even numbered years. EPA must then approve the Category 5 assessments. A single water body could have multiple assessments for different parameters in multiple categories but only the Category 5 assessments are submitted to EPA for approval. Appendix A is the 303(d) listing methodology.

CATEGORY 5E ASSESSMENTS also require TMDL development. EPA will add more Category 5 assessments if they believe that NC failed to identify all waters that exceeded criteria, based on NC water quality standards. This assessment indicates that EPA placed the assessment in Category 5 based on their independent assessment.

CATEGORY 5R ASSESSMENTS are assigned when TMDL action is deferred because of other documented actions to address the criteria exceedances.

V. ASSESSMENT METHODS

There are six different general assessment methods for water quality criteria assessment:

1) **(New for 2014**) 10 percent exceedance method with 90% statistical confidence, used for most numeric water quality criteria.
2) Biological rating method used to assess benthic and fish community collections.
3) Pathogen criteria method to assess recreation criteria.
4) Swimming advisory method to assess waters with postings.
5) Shellfish growing area assessment method.
6) Fish advice and advisories with fish tissue data method.

More than one method could be used on any individual AU depending on the data available and the water quality classification.

1. ASSESSING NUMERIC CRITERIA

The following sets of evaluations will be used for the 2014 assessment for these parameters: chlorophyll-*a*, dissolved oxygen, MBAS, mercury, nitrate/nitrite, pH, temperature, toxic substances, and turbidity. For each parameter there is a brief discussion of the criteria and other considerations used for assessment of the parameter including any parameter-specific good causes for not assessing in Category 5.

(New for 2014) The true frequency of criteria exceedances cannot be measured. It must be estimated from a set of samples, which introduces statistical uncertainty. The degree of uncertainty depends on the sample size. NC will use a nonparametric hypothesis testing approach based on the binomial distribution. The binomial method allows a quantifiable level of statistical confidence for listing decisions. A 90% confidence level was selected, which represents a 10% probability of listing an assessment unit when it should not be listed. The null hypothesis is that the overall exceedance probability is less than or equal to the 10% exceedance allowance.

A. EXCEEDING CRITERIA Greater than 10% exceedance with greater than or equal to 90% confidence, resulting in Category 4 or 5 assessments.

B. MEETING CRITERIA Less than 10% of samples exceed criteria (the probability of not listing an assessment unit when it should be listed is not considered), resulting in Category 1 assessments.

C. INCONCLUSIVE/INSUFFICIENT DATA TO MAKE AN ASSESSMENT Greater than or equal to 10% exceedance with less than 90% confidence, resulting in Category 3 assessments.

CHLOROPHYLL *A* (AQUATIC LIFE) CRITERIA

Chlorophyll *a* (corrected): Not greater than 15 µg/l in trout waters. Not greater than 40 µg/l for lakes, reservoirs, and other waters subject to growths of macroscopic or microscopic vegetation.

DISSOLVED OXYGEN (AQUATIC LIFE) CRITERIA

The dissolved oxygen (DO) criterion for trout waters is not less than 6.0 mg/l. For non-trout waters it is not less than 4.0 mg/l with a daily average of not less than 5.0 mg/l. The DO criterion for salt waters is 5.0 mg/l. There are exceptions to these criteria for classified Sw or swamp waters, lake coves or backwaters, lake bottom waters, poorly flushed tidally influenced streams or embayments and estuarine bottom waters *if the lower values are due to natural conditions*. Studies may be conducted to evaluate low DO to determine if natural conditions are the sole cause of criteria exceedances. If such a determination is made and documented, and EPA concurs, assessments may be moved to Category 1nc. An example of this type of documentation can be found here: http://portal.ncdenr.org/c/document_library/get_file?uuid=5648cbfc-72cd-42fe-b056-183abf42e227&groupId=38364.

NC also has an exception process for waters that are swamp-like but are not formally classified as Sw or swamp waters. These swamp-like waters are in the coastal plain and are usually near classified Sw waters or have been sampled using swamp stream criteria. Swamp streams stop flowing in summer months, but have visible flow during late winter. For more information, see the Benthos SOP at http://portal.ncdenr.org/web/wq/ess/bau.

MBAS (WATER SUPPLY) CRITERIA

The MBAS (methylene blue active substances) criterion is not to exceed 0.5 mg/l in water supply waters. This criterion is to protect aesthetic quality of water supplies and to prevent foaming.

MERCURY -WATER COLUMN (FISH CONSUMPTION) CRITERIA

The mercury criterion is 0.012 µg/l for all NC waters.

NITRATE/NITRITE (WATER SUPPLY) CRITERIA

The NO2+NO3-N criterion is 10 mg/l for water supply waters.

PH (AQUATIC LIFE) CRITERIA

The pH criteria are between 6.0 and 9.0 standard units for freshwater and between 6.8 and 8.5 for saltwater. pH can be as low as 4.3 for classified swamp waters if this is due to natural conditions. Studies may be conducted to evaluate low pH to determine if natural conditions are the sole cause of criteria exceedances. If such a determination is made and documented, and EPA concurs, assessments may be moved to Category 1nc. An example of this type of documentation can be found here: http://portal.ncdenr.org/c/document_library/get_file?uuid=5648cbfc-72cd-42fe-b056-183abf42e227&groupId=38364.

NC has an exception process for waters that are swamp-like but are not formally classified as Sw or swamp waters. These swamp-like waters are in the coastal plain and are usually near classified Sw waters or have been sampled using swamp biocriteria. Swamp streams stop flowing in summer months, but have visible flow during late winter. For more information, see the Benthos SOP at http://portal.ncdenr.org/web/wq/ess/bau.

TEMPERATURE (AQUATIC LIFE) CRITERIA

The temperature criteria are 29 °C for mountains and Piedmont AUs, 32°C for lower Piedmont and coastal plain waters and 20°C for supplemental classified Trout waters. See full standard for details.

TOXIC SUBSTANCES

ARSENIC (AQUATIC LIFE) (WATER SUPPLY) (HUMAN HEALTH) CRITERIA

The arsenic criteria are 50 µg/l for all NC waters for protection of aquatic life and 10 µg/l for water supply waters and 10 µg/l to protect human health in all waters. For assessment purposes the 10 µg/l was used as the evaluation level. The 50 µg/l has only been exceeded rarely in saltwaters.

CADMIUM (AQUATIC LIFE) CRITERIA

The cadmium criteria are 0.4 µg/l for trout waters, 2.0 µg/l for non-trout waters and 5.0 µg/l for salt waters.

CHLORIDE (AQUATIC LIFE) CRITERIA

The chloride criterion is not to exceed 230 mg/l in all NC waters.

CHLORINE (AQUATIC LIFE) CRITERIA

The chlorine (residual) criterion is not to exceed 17 µg/l in all NC waters.

CHROMIUM (AQUATIC LIFE) CRITERIA

The chromium criterion is 50 µg/l for in all NC waters.

COPPER (AQUATIC LIFE) CRITERIA

The copper criteria are 7 µg/l fresh waters and 3 µg/l for salt waters.

CYANIDE (AQUATIC LIFE) CRITERIA

The cyanide criterion is not to exceed 5 µg/l in all NC waters.

FLUORIDE (AQUATIC LIFE) CRITERIA

The fluoride criterion is not to exceed 1.8 mg/l in all NC waters.

LEAD (AQUATIC LIFE) CRITERIA

The lead criterion is 25 µg/l (recoverable) for in all NC waters.

NICKEL (AQUATIC LIFE) (WATER SUPPLY) CRITERIA

The nickel criteria are 88 µg/l for freshwater, 8.3 µg/l for saltwater and 25 µg/l for classified water supplies.

ZINC (AQUATIC LIFE) CRITERIA

The zinc criterion is 50 µg/l for all NC waters.

TURBIDITY (AQUATIC LIFE) CRITERIA

The turbidity criteria are 50 nephalometric turbidity units (NTU) for freshwaters, 25 NTU for reservoirs and estuarine waters, and 10 NTU for supplemental classified Trout waters.

2. ASSESSING NARRATIVE AQUATIC LIFE CRITERIA USING BIOLOGICAL RATINGS

Narrative criterion: Waters shall be suitable for aquatic life propagation and maintenance of biological integrity. NC uses benthic and fish community data to assess biological integrity. Biological integrity means the ability of an aquatic ecosystem to support and maintain a balanced and indigenous community of organisms having species composition, diversity, population densities and functional organization similar to that of reference conditions (15A NCAC 02B .0202). Refer to http://portal.ncdenr.org/web/wq/ess/bau for more information on the biological monitoring program including SOPs.

Multiple samples can improve the ability to determine the possible source(s) and the geographic extent of impairment. DWQ biological monitoring programs will enhance the use of multiple samples to provide additional support for the identification of impaired waters.

Assessment categories for benthos and fish community ratings are as follows:

A. EXCEEDING CRITERIA Poor, Fair, and Severe biological ratings are exceeding criteria resulting in Category 4 or 5 assessments.

B. MEETING CRITERIA Excellent, Natural, Good, Good-Fair, Moderate, and Not Impaired community ratings are meeting criteria and are Category 1 assessments.

C. INCONCLUSIVE/INSUFFICIENT DATA TO MAKE AN ASSESSMENT Community samples that are Not Rated are inconclusive usually because biocriteria have not been developed to assign a rating or the samples were collected during unusual conditions such as droughts. These are Category 3a assessments.

3. ASSESSING RECREATION CRITERIA USING PATHOGEN INDICATORS

FECAL COLIFORM BACTERIA CRITERIA

The criteria are fecal coliforms not to exceed a geometric mean of 200/100 ml (MF count) based on at least five consecutive samples examined during any 30-day period and not to exceed 400/100 ml in more than 20 percent of the samples examined during such period. These criteria are for freshwater. NC uses these criteria as the assessment method in freshwaters.

A. EXCEEDING CRITERIA The geometric mean is greater than 200 colonies/100ml of water or greater than 20% of the samples exceed 400 colonies/100ml, and there are at least five samples collected within a 30-day period. This is a Category 4 or 5 assessment.

B. MEETING CRITERIA The geometric mean is less than 200 colonies/100ml of water and less than 20% of the samples are below 400 colonies/100ml. Five samples in 30 days are not required for this assessment. Monthly data can be used to determine if fecal coliform bacteria are meeting criteria and assessed in Category 1.

C. INCONCLUSIVE/INSUFFICIENT DATA TO MAKE AN ASSESSMENT The geometric mean is greater than 200 colonies/100ml of water or greater than 20% of the samples exceed 400 colonies/100ml, and there are not at least five samples collected within a 30-day period. These are assessed in Category 3a.

ENTEROCOCCI BACTERIA CRITERIA

The enterococcus criterion in NC is not to exceed a geometric mean of 35 enterococci per 100 ml based upon a minimum of five samples within any consecutive 30 days. NC uses this criterion for assessment of saltwaters. Data for this assessment are collected by DMF Recreational Water Quality Monitoring program (http://portal.ncdenr.org/c/document_library/get_file?uuid=89ecc697-deb0-4e2c-a18d-5e1609242628&groupId=38337).

A. EXCEEDING CRITERIA The geometric mean was greater than 35 enterococci/100ml of water. There must also be at least five samples collected within a 30-day period. This is a Category 4 or 5 assessment.

B. MEETING CRITERIA The geometric mean is less than 35 enterococci/100ml of water. Five samples in 30 days are not required for this assessment. Monthly data can be used to determine if enterococci bacteria are meeting criteria and assessed in Category 1.

C. INCONCLUSIVE/INSUFFICIENT DATA TO MAKE AN ASSESSMENT The geometric mean is greater than 35 enterococci/100ml of water, and there are not at least five samples collected within a 30-day period. These are assessed in Category 3a.

4. ASSESSING RECREATION CRITERIA USING SWIMMING ADVISORY POSTINGS

Swimming advisory assessments have only been used in coastal areas where stormwater drains onto the beach and DMF does not monitor for enterococci. No Category 5 assessments are made using swimming advisories alone.

A. EXCEEDING CRITERIA When a water body has a swimming advisory posted for greater than 61 days of the five-year data window, these are Category 4 assessments.

B. MEETING CRITERIA If a waterbody is posted less than 61 days in the five-year data window, it was assessed in Category 1. These assessments are usually associated with Category 1 enterococci assessments.

C. INCONCLUSIVE/INSUFFICIENT DATA TO MAKE AN ASSESSMENT If an AU is posted with an advisory for exactly 61 days of the five-year data window, this is a Category 3a assessment.

5. ASSESSING SHELLFISH HARVESTING CRITERIA USING GROWING AREA CLASSIFICATION

Waters that are classified for shellfish harvesting for market purposes (Class SA) are assessed using DMF Shellfish Sanitation growing area classifications. These classifications are based on fecal coliform exceedances and sanitary surveys. DWQ will work with DMF to continue to better identify the spatial extent of the growing area classifications. Mapping issues in coastal areas have made it difficult to coordinate the two datasets.

A. EXCEEDING CRITERIA Shellfish growing areas that are not approved result in Category 4 or 5 assessments. These areas are prohibited, conditionally approved-closed, and conditionally approved-open. Administrative closures are assessed in Category 4.

B. MEETING CRITERIA Approved growing areas result in Category 1 assessments.

C. INCONCLUSIVE/INSUFFICIENT DATA TO MAKE AN ASSESSMENT Shellfish growing area assessments are either meeting or exceeding criteria only. There are no Category 3 assessments for this method.

6. ASSESSING FISH CONSUMPTION CRITERIA USING ADVICE AND ADVISORIES

Fish consumption was assessed based on site-specific fish consumption advisories developed using fish tissue data. Advisories and advice are developed by DHHS using fish tissue data collected by DWQ and others. See http://epi.publichealth.nc.gov/fish/current.html for all advice and advisories.

A. EXCEEDING CRITERIA AUs with site-specific advisories based on fish tissue data are exceeding criteria and assessed in Category 4 or 5.

B. MEETING CRITERIA AUs with no advice or advisories result in Category 1 assessments. DWQ will work with stakeholders to develop a process for recategorizing waters from Category 4t to Category 1t for mercury in fish tissue, consistent with EPA's Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion (EPA 823-R-10-001).

C. INCONCLUSIVE/INSUFFICIENT DATA TO MAKE AN ASSESSMENT There are no Category 3 assessments for this method.