2020 Integrated Report
Category Assignment Procedure

North Carolina

Draft January 29, 2021

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INTRODUCTION

The water quality assessment process is a framework used by the North Carolina Division of Water Resources 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 DWR 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; https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards/surface-water-standards). 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, reservoirs and estuaries, 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, reservoirs, estuaries, 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 https://deq.nc.gov/about/divisions/water-resources/planning/classification-standards

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.

DELISTING

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.

The delisting process for 2018 is fully described in the "2018 303(d) Listing and Delisting Methodology" found here: https://files.nc.gov/ncdeq/Water%20Quality/Planning/TMDL/303d/2018/2018%20Listing%20Methodology_ApprovedMarch2018.pdf.

303(D) LIST AND ASSESSMENT METHODOLOGY PUBLIC COMMENT

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 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 2018 assessment the terms Exceeding Criteria, Meeting Criteria, Data Inconclusive, 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. Data and information used for the 2020 assessment were collected in calendar years 2014-2018. Assessments based on older data were carried forward if newer data or information were not available to change the previous assessment decision.

Older data were not automatically excluded particularly when its inclusion could be used to augment small sets of more current data. For the 2020 assessment, the state augmented small sets of current data (i.e. when n<10) with the previous five years of data (2009-2013) where available for 303(d) listing consideration. NC required a minimum of three exceedances in the current data set for consideration for inclusion on the 303(d) list.

Most data used in the assessment process were collected by DWR and monitoring coalitions. However, anyone can submit data that meets DWR's quality control requirements. The detailed data submittal process can be found here: https://deq.nc.gov/about/divisions/water-resources/planning/modeling-assessment/water-quality-data-assessment. DWR 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. For the most part, assessment units (AUs) are the same as the classified named waters. However, during the assessment process, an AU may be re-segmented or split into smaller units because of different types of data, assessment result differences between stations in the same AU for any of the assessed parameters, or drainage area characteristics (e.g., major tributaries, land use changes).

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).

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. 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. In 2016 NC started using a color scheme to standardize symbology on maps and to easily identify if an AU has any assessments exceeding criteria.

1. RED There is at least one category 5 assessment
2. PINK There is at least one category 4 assessment and no category 5 assessments
3. GRAY There are only data inconclusive assessments or at least one pathogen assessment is data inconclusive
4. BLUE All assessments are meeting criteria
5. GREEN No data are available to make assessments in this AU

Note that all NC waters are in category 4t due to statewide fish consumption advice for Mercury and there is a TMDL in place.

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 1F ASSESSMENTS are assigned when fish tissue data are collected and there are no fish consumption advisories in place other than the statewide Mercury advice.

CATEGORY 1I ASSESSMENTS are assigned when a parameter is meeting criteria and there is an approved TMDL in place for a different parameter that addresses the indicator parameter. Examples would be nutrient TMDLs in category 4t and chlorophyll a in category 4i. Prior to TMDL development these were Category 5 assessments.

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 Carolina 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 1R ASSESSMENTS are assigned when a parameter is meeting criteria and there is water resource restoration plan in place that addresses the parameter.

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 following are causes for 3a assessments:

- 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 (the most common type of 3a assessment).
- Preferred minimum number of samples (N>9) were not collected during the five-year data window and augmentation was not possible.
- 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.
- Greater than or equal to 10% of samples exceed criteria with less than 90% confidence, and there is no approved TMDL.
- Where there were exceedances of DO and pH criteria in swamp and swamp-like waters. These are prioritized for natural conditions assessments.

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 3C ASSESSMENTS are assigned when a parameter is assessed as data inconclusive 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.

CATEGORY 3I ASSESSMENTS were assigned when data were insufficient or there were no instream data to make an assessment and there is an approved TMDL in place for a different

parameter that addresses the indicator parameter. Examples would be nutrient TMDLs in category 4t and chlorophyll a in category 4i. Prior to TMDL development these were Category 5 assessments.

CATEGORY 3R ASSESSMENTS were assigned when data were insufficient or there were no instream data to make an assessment and there is water resource restoration plan in place that addresses the parameter.

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.

CATEGORY 3Z1 ASSESSMENTS are assigned when data are not assessed using an NC water quality standard. Iron is assessed in this category.

CATEGORY 3Z2 ASSESSMENTS are assigned to track when new monitoring stations come on line to indicate that new impairments were due to new data collections.

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, however the state is required to report on implementation activities every 2 years.

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. In 2020 4c assessments were made for dams that have deemed obsolete and stakeholders are developing removal plans.

CATEGORY 4CR ASSESSMENTS were assigned only for beach swimming areas where Division of Marine Fisheries Recreational Water Quality Monitoring had posted "Swimming Advisories" for greater than 61 days in the 5 year assessment period. 4cr can also be assigned with documentation from local county health directors that “Swimming Advisories” have been posted for greater than 61 days in the 5 year assessment period. A TMDL is not required for parameters assessed in Category 4cr.

CATEGORY 4CS ASSESSMENTS Shellfish growing is not Approved for harvesting and there is an approved fecal coliform TMDL in the assessment unit.

CATEGORY 4I ASSESSMENTS were assigned when a parameter exceeded criteria and there is an approved TMDL in place for a different parameter that addresses the indicator parameter.

CATEGORY 4R ASSESSMENTS were assigned for straight to implementation assessments for parameters or measures that do not have water quality standards but are addressed during implementation of watershed restoration plans.

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. Examples would be nutrient TMDLs in category 4t and chlorophyll a in category 4i. 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. The 2018 303(d) Listing and Delisting Methodology can be found here: https://files.nc.gov/ncdeq/Water%20Quality/Planning/TMDL/303d/2018/2018%20Listing%20Methodology_ApprovedMarch2018.pdf.

CATEGORY 5E ASSESSMENTS are waters that have been added to the list by EPA. They also require TMDL development. EPA will add 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. This includes water resource restoration plans.

E. INTEGRATED REPORTING CATEGORIES SUMMARY DRAFT 2020

Draft IR Category Summary 2020				
IR CATEGORY	Total	Data Inconclusive	Exceeding Criteria	Meeting Criteria
1	11705		1	11704
1b	6	2		4
1nc	4			4
1r	11			11
1t	36	3		33
3a	1886	1627	247	12
3b	5	5		
3c	3	3		
3t	19	18		1
3v	2	2		
3r	3	3		
4t	256	34	221	1
4c	27		27	
4s	31		31	
4v	3		3	
5	1346	72	1274	
5r	17		17	
4b	17		17	
3z1	95	95		
1f	3			3
4cs	132		132	
4i	47		45	2
1i	13			13
3i	10	9		1
4cr	6		6	