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Waters Assessed as Impaired due to Nutrient-Related Causes



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About this indicator

Every two years states are required to submit Water Quality Assessment Reports under Sections 305(b) and 303(d) of the Clean Water Act describing the condition of waters in the state. These reports include water quality information on rivers, lakes, estuaries, and coastal waters, and an analysis of the extent to which waters are meeting water quality standards. Waters are assessed as impaired when an applicable water quality standard is not being attained. Impaired waters require a total maximum daily load (TMDL) or alternative restoration plan to reduce pollutant loadings and restore the waterbody. This indicator displays information about the extent of documented nutrient-related impairments of state surface waters (not including Great Lakes, coastal waters, or wetlands). This reflects states' efforts to implement numeric and/or narrative criteria for nutrients by assessing waters for nutrient pollution and then listing waters as impaired to begin the restoration process. 'Nutrient-related' impairments include those from the following parent categories in EPA's Assessment, TMDL Tracking And Implementation System (ATTAINS) database: nutrients, algal growth, ammonia, noxious aquatic plants, and organic enrichment/oxygen depletion. Data provided in this indicator are for rivers/streams, lakes/reservoirs and bays/estuaries, and help demonstrate:

- The extent to which a state is assessing its waters for nutrient-related parameters,
- The extent of nitrogen and phosphorus pollution in the state, and
- The extent to which the state is working towards restoring nutrient-impaired waters by developing TMDLs or alternative restoration plans.

To obtain more information on which waters have been listed by a state as impaired by nutrients and which of those waters have an associated TMDL, users can visit EPA's [Nitrogen and Phosphorus Pollution Data Access Tool](#).

- [Rivers Assessed as Impaired due to Nutrient-Related Causes](#)
- [Lakes Assessed as Impaired due to Nutrient-Related Causes](#)
- [Bays/Estuaries Assessed as Impaired due to Nutrient-Related Causes](#)

State river water quality assessment results as reflected in states' most recent Integrated Water Quality Assessment Report or 305(b) Water Quality Assessment Report, and progress towards restoring nutrient-impaired rivers.

State	Rivers assessed (miles)	% of river miles assessed	Rivers with a nutrient-related impairment (miles)	% of assessed rivers that have a nutrient-related impairment	% of nutrient-impaired rivers that have all impairments addressed by a TMDL or alternative restoration plan	Reporting Cycle (year)
Alabama	10,538	14%	1,146	11%	53%	2010
Alaska	602	0%	15	2%	100%	2010
Arizona	2,764	3%	144	5%	6%	2008
Arkansas	9,979	11%	1,440	14%	2%	2008
California	32,803	16%	13,350	41%	±	2004
Colorado	59,639	56%	281	0%	14%	2010
Connecticut	2,367	41%	2	0%	73%	2010
Delaware	2,506	100%	2208	88%	37%	2006
Florida	10,476	20%	5,587	53%	±	2010
Georgia	13,393	19%	1272	9%	78%	2010
Hawaii	9	0%	5	59%	±	2006
Idaho	60,291	52%	7,160	12%	61%	2008
Illinois	15,424	18%	4430	29%	1%	2006
Indiana	24,070	67%	2,188	9%	0%	2010
Iowa	20,075	28%	304	2%	27%	2010
Kansas	27,408	20%	15,095	55%	±	2008

State	Rivers assessed (miles)	% of river miles assessed	Rivers with a nutrient-related impairment (miles)	% of assessed rivers that have a nutrient-related impairment	% of nutrient-impaired rivers that have all impairments addressed by a TMDL or alternative restoration plan	Reporting Cycle (year)
Kentucky	10,774	22%	1,878	17%	0%	2010
Louisiana	9,484	14%	4,469	47%	27%	2010
Maine	61,795	100%	486	1%	9%	2010
Maryland	6,331	72%	0	0%	±	2002
Massachusetts	2,745	28%	749	27%	2%	2010
Michigan	76,439	100%	2,003	3%	26%	2010
Minnesota	14,558	16%	1,978	14%	2%	2010
Mississippi	3,853	5%	200	5%	80%	2010
Missouri	16,516	32%	1,446	9%	±	2010
Montana	20,242	11%	7,692	38%	3%	2010
Nebraska	8,672	11%	34	0%	±	2010
Nevada	4490	29%	1,007	22%	2%	2006
New Hampshire	16,896	100%	789	5%	7%	2010
New Jersey	18,974	96%	7,864	41%	9%	2010
New Mexico	6,262	6%	1,125	18%	15%	2010
New York	27,280	52%	1,857	7%	±	2010
North Carolina	12,080	32%	242	2%	±	2010
North Dakota	54,606	100%	518	1%	6%	2010
Ohio	52,483	90%	30,427	58%	±	2010
Oklahoma	12,473	16%	2,366	19%	0%	2010
Oregon	46,038	40%	18,959	41%	±	2006
Pennsylvania	86,034	100%*	3,722	4%	0%	2006

State	Rivers assessed (miles)	% of river miles assessed	Rivers with a nutrient-related impairment (miles)	% of assessed rivers that have a nutrient-related impairment	% of nutrient-impaired rivers that have all impairments addressed by a TMDL or alternative restoration plan	Reporting Cycle (year)
Rhode Island	917	65%	53	6%	0%	2010
South Carolina	5,378	18%	559	10%	8%	2010
South Dakota	6,207	7%	408	7%	0%	2010
Tennessee	30,629	50%	3,631	12%	4%	2010
Texas	23,546	12%	2,048	9%	0%	2010
Utah	10,569	12%	968	9%	58%	2010
Vermont	5,555	78%	19	0%	32%	2008
Virginia	17,728	35%	1,941	11%	2%	2010
Washington	1,997	3%	396	20%	0%	2008
West Virginia	18,818	58%	163	1%	3%	2010
Wisconsin	15,132	18%	2,593	17%	45%	2006
Wyoming	7,504	7%	56	1%	0%	2010

Note - "Nutrient-related" impairment includes waters impaired for nutrients, algal growth, ammonia, noxious aquatic plants, and organic enrichment/oxygen depletion. Impaired waters include those from Integrated Reporting Categories 4 (mostly with a TMDL) and 5 (need a TMDL). Values are rounded to the nearest whole number. Therefore, values < 0.5% = 0% and values > 99.5% = 100%. Data pertaining to % of assessed waters that have a nutrient-related impairment are likely an underestimate given that states may not necessarily assess each water for nutrients, specifically.

± These states have not provided the necessary information in their data submission to distinguish between Category 4 and Category 5 impaired waters, therefore these data were not reported.

* In some cases the state erroneously reported a greater # of waters assessed than the total # of waters in the state, resulting in > 100% assessed, as indicated by the 100%*.

Source: State's most recent electronic Integrated Report or 305(b) Report data submitted to the EPA's Assessment, TMDL Tracking And Implementation System (ATTAINS) website. Date of data pull: 11/4/11

Download the [Impaired Rivers data table \(excel\)](#). (2 pp, 17 K)

State lake and reservoir water quality assessment results as reflected in states' most Integrated Water Quality Assessment Report or 305(b) Water Quality Assessment Report, and progress towards restoring nutrient-impaired lakes and reservoirs.

State	Lakes/reservoirs assessed (acres)	% of lakes/reservoirs assessed in the state	Lakes/reservoirs with a nutrient-related impairment (acres)	% of assessed lakes/reservoirs that have a nutrient-related impairment	% of nutrient impaired lakes/reservoirs that have an impairment addressed by TMDL or alternative restoration plan
Alabama	430,976	88%	81,740	19%	53%
Alaska	5,981	0%	1,137	19%	73%
Arizona	114,976	34%	4,895	4%	9%
Arkansas	64,778	13%	6,513	10%	71%
California	1,051,246	50%	473,954	45%	±
Colorado	155,399	95%	10,211	7%	0%
Connecticut	30,438	47%	3,719	12%	7%
Delaware	2,954	100%	2,594	88%	69%
Florida	1,124,399	54%	919,000	82%	±
Georgia	349,375	82%	6,932	2%	20%
Hawaii	No data	No data	No data	No data	No data
Idaho	223,244	48%	150,119	67%	9%
Illinois	146,732	47%	131,114	89%	3%
Indiana	231,083	162%	23,408	10%	±
Iowa	178,265	88%	28,736	16%	34%
Kansas	255,902	100%	207,460	81%	±
Kentucky	219,418	96%	9,485	4%	0%
Louisiana	668,847	62%	89,605	13%	22%
Maine	1,984,170	100%*	36,533	2%	76%
Maryland	18,676	24%	0	0%	±
Massachusetts	85,056	56%	19,826	23%	22%
Michigan	872,179	98%	6,048	1%	3%

State	Lakes/reservoirs assessed (acres)	% of lakes/reservoirs assessed in the state	Lakes/reservoirs with a nutrient-related impairment (acres)	% of assessed lakes/reservoirs that have a nutrient-related impairment	% of nutrient impaired lakes/reservoirs that have an impairment addressed by TMDL or alternative restoration plan
Minnesota	3,758,412	84%	480,679	14%	1%
Mississippi	36,807	7%	0	0%	0%
Missouri	290,442	99%	167,979	58%	±
Montana	533,651	63%	180,267	34%	2%
Nebraska	138,672	50%	105,220	76%	±
Nevada	299,148	54%	54,765	18%	±
New Hampshire	185,273	100%	47,215	25%	0%
New Jersey	47,846	66%	16,640	35%	17%
New Mexico	62,978	6%	10,007	16%	0%
New York	535,659	68%	151,206	28%	±
North Carolina	176,466	57%	71,951	41%	±
North Dakota	700,259	98%	140,550	20%	3%
Ohio	21,134	100%*	0	0%	±
Oklahoma	604,594	58%	424,172	70%	±
Oregon	138,358	22%	126,335	91%	±
Pennsylvania	No data	No data	No data	No data	No data
Rhode Island	15,582	75%	2,385	15%	54%
South Carolina	127,397	31%	23,638	19%	0%
South Dakota	135,577	18%	11,322	8%	0%
Tennessee	565,543	99%	38,066	7%	±
Texas	1,461,997	73%	25,998	2%	0%
Utah	468,877	97%	150,431	32%	18%
Vermont	229,722	100%	139,927	61%	8%

State	Lakes/reservoirs assessed (acres)	% of lakes/reservoirs assessed in the state	Lakes/reservoirs with a nutrient-related impairment (acres)	% of assessed lakes/reservoirs that have a nutrient-related impairment	% of nutrient impaired lakes/reservoirs that have all impairment addressed by TMDL or alternative restoration plan
Virginia	112,677	75%	47,165	42%	0%
Washington	464,530	100%*	37,031	8%	0%
West Virginia	13,199	59%	96	1%	100
Wisconsin	678,111	36%	260,011	38%	90%
Wyoming	18,924	6%	15	0%	0%

Note - "Nutrient-related" impairment includes waters impaired for nutrients, algal growth, ammonia, noxious aquatic plants, and organic enrichment/oxygen depletion. Impaired waters include those from Integrated Reporting Categories 4 (mostly with a TMDL) and 5 (need a TMDL). Values are rounded to the nearest whole number. Therefore, values < 0.5% = 0% and values > 99.5% = 100%. Data pertaining to % of assessed waters with a nutrient-related impairment are likely an underestimate given that states may not necessarily assess each water for nutrients, specifically.

± These states have not provided the necessary information in their data submission to distinguish between Category 4 and Category 5 impaired waters, therefore these data were not reported.

* In some cases the state erroneously reported a greater # of waters assessed than the total # of waters in the state, resulting in > 100% assessed, as indicated by the 100%*.

Source: State's most recent electronic Integrated Report or 305(b) Report data submitted to the EPA's Assessment, TMDL Tracking And Implementation System (ATTAINS) website. Date of data pull: 11/4/11

Download the [Impaired Lakes data table \(excel\)](#) (2 pp, 17 K)

State bay/estuary water quality assessment results as reflected in states' most recent Integrated Water Quality Assessment Report or 305(b) Water Quality Assessment Report, and progress towards restoring nutrient-impaired bays/estuaries.

State	Bays/estuaries assessed (mi ²)	% of bays/estuaries assessed in the state	Bays/estuaries with a nutrient-related impairment (mi ²)	% of assessed bays/estuaries that have a nutrient-related impairment	% of nutrient-impaired bays/estuaries that have all impairments addressed by a TMDL or alternative restoration plan	RC (C)
Alabama	734	100%*	0	0%	0%	2
Alaska	31	0%	1	2%	100%	2

State	Bays/estuaries assessed (mi ²)	% of bays/estuaries assessed in the state	Bays/estuaries with a nutrient-related impairment (mi ²)	% of assessed bays/estuaries that have a nutrient-related impairment	% of nutrient-impaired bays/estuaries that have all impairments addressed by a TMDL or alternative restoration plan	RC (C)
California	904	42%	30	3%	±	2
Connecticut	612	100%	305	50%	59%	2
Delaware	30	7%	29	98%	10%	2
Florida	5,317	100%*	1,795	32%	±	2
Georgia	63	7%	14	22%	100%	2
Hawaii	36	65%	30	83%	±	2
Louisiana	4,954	65%	858	17%	22%	2
Maine	156	5%	1	0%	±	2
Maryland	2,499	99%	0	0%	±	2
Massachusetts	247	99%	53	21%	21%	2
Mississippi	No data	No data	No data	No data	No data	2
New Hampshire	99	100%	14	14%	0%	2
New Jersey	740	97%	158	21%	9%	2
New York	1,222	80%	152	12%	±	2
North Carolina	2,932	94%	133	5%	±	2
Oregon	No data	No data	No data	No data	No data	2
Rhode Island	159	100%	49	31%	0%	2
South Carolina	588	100%*	14	2%	23%	2
Texas	6,011	100%*	614	10%	0%	2
Virginia	2,301	92%	2,096	91%	0%	2
Washington	No data	No data	No data	No data	No data	2

Note - "Nutrient-related" impairment includes waters impaired for nutrients, algal growth, ammonia, noxious aquatic plants, and organic enrichment/oxygen depletion. Impaired waters include those from Integrated Reporting Categories 4

(mostly with a TMDL) and 5 (need a TMDL). Values are rounded to the nearest whole number. Therefore, values < 0.5% = 0% and values > 99.5% = 100%. Data pertaining to % of assessed waters with a nutrient-related impairment are likely an underestimate given that states may not necessarily assess each water for nutrients, specifically.

± These states have not provided the necessary information in their data submission to distinguish between Category 4 and Category 5 impaired waters, therefore these data were not reported.

* In some cases the state erroneously reported a greater # of waters assessed than the total # of waters in the state, resulting in > 100% assessed, as indicated by the 100%*.

Source: State's most recent electronic Integrated Report or 305(b) Report data submitted to the EPA's Assessment, TMDL Tracking And Implementation System (ATTAINS) website. Date of data pull: 11/4/11

Download the [Impaired Estuaries data table \(excel\)](#) (2 pp, 15 K)

Source of data

1. US EPA. 2011. [Water Quality Assessment and Total Maximum Daily Loads Information: Assessment, TMDL Tracking And Implementation System \(ATTAINS\)](#).

Data source information

This indicator includes data submitted by states to EPA under sections 305(b) and 303(d) of the Clean Water Act, and which were obtained from EPA's Assessment, TMDL Tracking and Implementation System (ATTAINS) website. The source of the information available in the ATTAINS database are electronic data submitted by states, which can be data from an Integrated Water Quality Assessment Report (recommended by EPA) or from a 305(b) Water Quality Assessment Report.

In Integrated Water Quality Assessment Reports, each assessed waterbody or waterbody segment is listed in one of the five following categories (collectively these are the 305b data):

- Category 1 – Attaining all designated uses
- Category 2 – Attaining some designated uses, and insufficient or no data information to determine if remaining uses are attained
- Category 3 – Insufficient or no data and information to determine if any use is attained
- Category 4- Impaired or threatened for one or more uses but not needing a TMDL because –

- a) TMDL has been completed
- b) Expected to meet standards
- c) Not impaired by a pollutant

- Category 5 – Impaired or threatened by pollutant(s) for one or more designated uses and requiring a TMDL. These are the waters entered onto a states' 303(d) list.

In 305(b) Water Quality Assessment Reports, assessed waters are categorized according to the degree to which they support their designated uses:

- Good water quality – fully supporting or fully supporting but threatened
- Fair water quality – partially supporting (impaired)
- Poor water quality – not supporting (impaired)

Data in this indicator on waters assessed as impaired due to nutrient-related causes include all Category 4 and 5 waters from Integrated Reports, and fair/partially supporting or poor/not supporting waters from 305(b) Reports.

What to consider when using these data

- In ATTAINS, the most recent reporting cycle year varies by state and can be as far back as 2002. Data for each state are current as of the year listed in the column "Reporting Cycle (year)" within the data tables. Note that the data are static and not automatically linked to ATTAINS updates.

- The total size (length or area) of waters assessed as impaired was filtered to exclude double counting (i.e., waters listed as impaired for multiple nutrient-related causes were only counted once in this dataset).
- The % of nutrient-impaired waters that have all impairments addressed by a TMDL or alternative restoration plan could not be calculated for states that do not submit 1) an Integrated Report and/or 2) TMDL IDs with their 305(b) data. For states that submit separate 305(b) and 303(d) Reports, TMDL data and 303(d) data (impaired waters needing a TMDL) are not true subsets of the 305(b) data on assessments of waters, and so often do not correlate with the 305(b) data, making comparisons not possible. As a result, it is not known whether impaired waters from these states' 305(b) Reports have an associated TMDL (Category 4a in the Integrated Report) or need a TMDL (Category 5 in the Integrated Report). For states that haven't submitted TMDL IDs with their 305(b) data, it is not known if an impaired water with a specific nutrient-related cause is in Category 4a (TMDL completed) for that cause. In both of these cases, all impaired waters from a state's 305(b) data will evaluate to a Category 5 by the ATAINS data system. In this indicator, the % of nutrient-impaired waters that have all impairments addressed by a TMDL or alternative restoration plan is not entered for states that don't submit an Integrated Report or supporting data such as TMDL IDs correlating to their 305(b) data (and is indicated by '±' in the data tables). However, users can browse states' websites and/or contact such states for any relevant information they may be able to provide.
- Data in this indicator do not include impairment or assessment information for coastal waters or for the Great Lakes, since both are listed in miles instead of square miles.
- The inclusion of waters listed for organic enrichment/oxygen depletion may provide a slight overestimate of nutrient impaired waters. Low dissolved oxygen levels are typically an indirect effect of nitrogen and phosphorus pollution; however, in some cases, the cause of low dissolved oxygen concentrations may be due to factors other than nutrient enrichment.
- Some states may not fully monitor/assess waters for nutrient-related parameters, resulting in an underestimation of the actual extent of assessed waters impaired by nitrogen and phosphorus pollution in these states. Documentation of nutrient-impaired waters indicates that a state has developed numeric or narrative criteria for nutrient-related pollution, or implements a general narrative criterion.

References and links to other data sources

1. Dubrovsky, N.M., Burow, K.R., Clark, G.M., Gronberg, J.M., Hamilton P.A., Hitt, K.J., Mueller, D.K., Munn, M.D., Nolan, B.T., Puckett, L.J., Rupert, M.G., Short, T.M., Spahr, N.E., Sprague, L.A., and Wilber, W.G. 2010. [The quality of our Nation's waters—Nutrients in the Nation's streams and groundwater, 1992–2004: US Geological Survey Circular 1350.](#)
2. Shipp, A. and Cordy, G.E. 2002. [The USGS role in TMDL assessments: US Geological Survey Fact Sheet 130-01.](#)
3. US EPA. [Overview of impaired waters and total maximum daily loads program.](#)
4. US EPA. [Ask Waters data query tool.](#)
5. US EPA. [WATERS Geospatial Data Downloads site.](#)
6. US EPA. [Reach Address Database \(RAD\) Download tool.](#)
7. US Geological Survey. National Water Quality Assessment Program (NAWQA): [State assessments of beneficial uses and impaired waters.](#)
8. US EPA. [Monitoring, Assessment and Reporting Guidelines.](#)

LAST UPDATED ON FEBRUARY 19, 2019