National Lakes Assessment 2012

Overview of Minnesota's 2012 Survey

This is part of a series based on Minnesota's participation in the United States Environmental Protection Agency's 2012 National Lakes Assessment

Minnesota Pollution Control Agency

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Contributors/acknowledgements

Minnesota's 2012 National Lakes Assessment was led by MPCA's Water Quality Monitoring Unit. Team leads for the survey, which included responsibility for field reconnaissance, assembling and purchasing needed equipment, office logistics, and sampling of the lakes were Pam Anderson, Jesse Anderson, Kelly O'Hara, Lee Engel, Dereck Richter, and Steve Heiskary. Amy Garcia and Courtney Ahlers-Nelson (Water Quality Monitoring Unit), Mike Kennedy and Andrew Swanson (Duluth Watershed Unit), and student workers Will Long and Ben Larson also assisted with the sampling.

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Overview of Minnesota's 2012 survey

Minnesota routinely participates in the U.S. Environmental Protection Agency's (EPA) national random surveys of lakes, streams, wetlands, and estuaries. These surveys occur on a rotating five-year basis. The first NLA was in 2007. In that survey, Minnesota received 42 lakes as a part of the national draw and added 8 lakes to allow for state-based assessment. Several partnerships were established to help conduct the survey and prominent partners included Minnesota Department of Natural Resources (MDNR), Minnesota Department of Agriculture (MDA), and the U.S. Forest Service (USFS) (Superior National Forest), and National Park Service (NPS). With aid of these partners, there were several significant add-ons to the national study. These add-ons yielded several state-based assessment reports that may be found on http://www.pca.state.mn.us/index.php/water/water-types-and-programs/surface-water/lakes/national-lakes-assessment-project-nlap.html .

The purpose of this report is to provide an overview of Minnesota's 2012 NLA project, describe study design, acknowledge partnerships, review summer 2012 field work and issues confronted, and describe anticipated work products from the 2012 NLA.

Study design

Minnesota received 42 lakes in the draw and two re-sample lakes as a part of the national draw. Of the 42, one was on the White Earth Reservation and the White Earth Band Natural Resources staff indicated the Minnesota Pollution Control Agency (MPCA) should include this in the Minnesota sample frame. The MPCA added 8 lakes from the overdraw pool to yield 50 lakes, which allows for statistically based condition estimates for Minnesota's lakes. All 50 lakes followed the national protocols that included water chemistry sampling, sediment core collection, and physical-habitat assessment and is referred to as the national or 50-lake frame. In addition, MPCA added 100 lakes from the overdraw pool to allow for ecoregion-based assessments for the three aggregated ecoregions that comprise Minnesota: Northern Forests, East Temperate Forests, and Great Plains. To ensure that each ecoregion had 50 lakes sampled, the overdraw list was sorted by region and NLA identification number and lakes were incorporated (in order) to yield 150 lakes or then, 50 per region (note – this step was not taken until the 50-lake national frame was determined). Water chemistry, dissolved oxygen and temperature profiles, Secchi, microcystin, triazine assay, and zooplankton samples were collected from each of these lakes. This 150-lake frame provides comprehensive and representative coverage of lakes across Minnesota (Figure 1).

EPA in-kind laboratory services (with the exception of microcystin) were used to process all 52 samples (50 plus 2 repeats) for the national and state frame, while the Minnesota Department of Health (MDH) conducted water chemistry analyses for the 100 ecoregion lakes. Split samples were collected on several national lakes that allows for an inter-laboratory comparison between the EPA lab and MDH. This was important, as data from the two laboratories will be pooled for the ecoregion-based assessments. A similar comparison in the 2007 NLA found reasonably good agreement among the two laboratories and where an issue was found (total phosphorus) this contributed to some adjustment of national protocol in 2012 (acid preservation of sample on site). All microcystin samples from Minnesota's 2012 NLA were run at MDH in accordance with EPA methods. An overview of the parameters measured in the national and ecoregion-based lakes is summarized in Table 1 and the complete lake list is in Table 2.

Partnerships

Several partnerships needed to be established to successfully conduct a project of this scope. In Minnesota, these included other state agencies, federal agencies, and Native American bands. A brief summary follows.

1. State agencies – The MPCA enlisted the assistance of the MDNR, MDA, and the MDH in the 2012 NLA. Each had played some role in the 2007 NLA as well. MDNR assisted with lake sampling and field reconnaissance, and will be involved in data analysis. MDNR played a similar role in the 2007 NLA. Some specific projects they will be involved in are summarized at the end of this memorandum. The MDA provided bottles and laboratory support for pesticide sampling on the 50 national lakes and triazine assay work on the 100-ecoregion lakes. MDA will conduct an analysis of this data, similar to what was done in 2007.
2. Federal agencies - The USFS was a critical partner and, as in 2007, assisted in sampling remote lakes in the Superior National Forest. The National Park Service was also enlisted to assist with one lake in Voyageurs National Park.
3. Native American bands – The 2012 NLA lake draw resulted in several lakes within the boundaries of the White Earth, Red Lake, and Leech Lake reservations. The White Earth Reservation in northwest Minnesota is in a very lake-rich portion of the state and as such, numerous lakes were included in Minnesota's draw. Since many of the lakes did not have public access, there was a need to find access to the lakes and determine whether they fit the requirements of the study. Will Bement, of the White Earth Natural Resources, was very helpful in this step as he was able to visit several of the lakes, suggest access points, and in some instances make landowner contacts. This was an essential step to allow for sampling of these lakes. Two lakes were located within the Red Lake Reservation. Shane Bowe with the Red Lake Department of Natural Resources coordinated efforts to acquire permission to sample these lakes. He and one of his staff also assisted in sampling the two lakes, one of which is deep in a bog area of the reservation and required use of their special all-terrain vehicle (see Figure 2). There were two lakes within the Leech Lake Reservation; however, both were publically accessible and did not require additional assistance. Data from all these lakes will be assembled and shared with the respective Band natural resource departments.

Fieldwork: logistics, challenges, and lake replacement in 2012 survey

Conducting NLA survey work on 150 lakes proved to be rather challenging. This meant that multiple field crews were out in any given week and in lakes with difficult access, multiple crews were needed to ensure transport of equipment to the lake, e.g. remote lakes in the Boundary Waters Canoe Area Wilderness (BWCAW) and/or collection of sediment cores when canoes were used (Figure 2). While fieldwork was completed between mid-June to early September 2012, this does not reflect the total amount of time and effort put into the survey in preparation for the actual fieldwork. A review of that effort and issues faced is merited.

Given that lake selection was random and the minimum lake size was 1 hectare (2.47 acres) the vast majority of lakes did not have public access. Many of the lakes in the initial draw were in the midst of densely forested (and sometimes road-less) areas or within the confines of private property. Before any field reconnaissance was undertaken, all lakes were located on Google maps and desktop review was conducted looking for potential access points, likelihood the lake had sufficient open water, and how the lake image changed over time (provide a sense of wet year vs. dry years). An extensive field reconnaissance effort was conducted late summer 2011 by unit staff, with additional assistance from MDNR fishery area staff and Band natural resources staff. As a part of this, potential access points were identified and, where needed, landowner contacts were made and other arrangements for access were

made. Determining land ownership was not always a straightforward process as plat maps and signage were not always up-to-date and phone numbers for some owners were not available. We had reasonably good success gaining access when we were able to make contact with landowners; however, in some instances lakes had to be deleted from the survey because landowner permission could not be obtained. As a part of the 2011 reconnaissance, pictures were taken and staff documented whether the lake appeared to meet the requirements of the survey (i.e. a maximum depth of three feet or more and adequate open water).

Lake replacements were required in two instances for lakes in the 42-lake national and one in the state (50-lake) frame. In each case, the original lake was deep within the BWCAW and could not be reached with a reasonable effort, in the timeframe necessary to meet study requirements. The USFS was consulted and they concurred based on their experience. Nearby, similar lakes were selected as replacements and are labeled with an "A" in the lake list. These replacements were shared with the EPA Corvallis Environmental Research Lab and made part of the national and state (50-lake) frame.

Several other replacements were made in the course of the survey and this included lakes that were part of the national and state 50-lake frame. Figure 3 shows location of lakes that were deleted from the survey. A primary reason for loss of lakes was the drought, which resulted in lakes being too shallow, dry, and/or completely covered with emergent vegetation (Figure 4). In total, we estimate that ~51 of the 105 lakes deleted from the survey were related to the drought. In most instances, these lakes appeared to be valid targets during the 2011 reconnaissance. Included among these lakes was a 2007 revisit lake: NLA12_MN-117 Fanny Lake. The U.S. Drought Monitor map (Figure 5) shows the drought was particularly acute in northwestern and throughout south and southwestern Minnesota, and as a result, several shallow lakes were lost in these regions.

When lakes were deleted in the national or state-frame (50-lake frame), the next lake on this list was used, as per recommended NLA procedure. Later in the survey, as we were trying to complete the 100-lake ecoregion frame, we began to use nearby lakes as replacements for lakes that were deemed non-target – most commonly because they were dry, too shallow, macrophyte covered, or not accessible. These replacement lakes were close-by, in a similar geographic setting, and were of a similar size, whenever possible. This was done to ensure that there would be 50 lakes per region, retain good geographic coverage, and that survey work could be completed during summer 2012. Replacements are noted with an "A" suffix and correct coordinates and related information has been supplied.

Data analyses and reporting

We have plans for extensive reporting on this dataset and this work is being initiated as data becomes available. Much of this work will be done in conjunction with partners in the survey. We anticipate development of several stand-alone but complimentary reports. Following are some examples:

- Lake-specific reports will be done that allow comparison of 2007 and 2012 results and we will also provide targeted reports to property owners and others interested in results from the survey. We will also assemble survey data and brief reports for the White Earth and Red Lake Natural Resource Departments.
- Water samples were collected and analyzed for selected pesticides and triazine assay on the first 50 lake-frame. The MDA conducted or contracted laboratory analysis as a part of their overall monitoring. These data will complement the EPA triazine assay on these lakes. The pesticide data will allow for an unbiased assessment of the range (distribution) and spatial patterns in pesticide concentrations across the state. Since pesticide analysis was also conducted in the 2007 NLA, there will be an opportunity to assess trends based on revisits to 23 lakes in 2012. The pesticide data also provides a basis for comparison with triazine (amino assay) screen results on 50 lakes. This will be of

value as the pesticide screen was conducted on the 100 ecoregion-based lakes and allow for an ecoregion-based perspective.

- Microcystin (MC) analysis was conducted on all 150 lakes. This will allow for state and ecoregion-based assessment and testing of previously developed predictive models based on chlorophyll-a, Secchi and pH. Samples were collected at mid-lake on all lakes and at one nearshore site on the first 50 lakes (and 2 re-sample lakes) as per NLA protocol. All MC analyses were done under contract with MDH. Analysis was in accordance with NLA protocols and data supplied to EPA.
- MDNR will conduct identification and enumeration of large (non-rotifer) zooplankton in 100 ecoregion-based lakes and analyze data. These samples were collected in standard 80 um nets with a tow from 0.5 m off the bottom to the surface. To ensure comparability across the entire 150-lake frame, they also elected to identify samples from the 50–lake frame as well and samples were collected for this purpose. This will be an impressive dataset that can later be combined with the contractor-analyzed data from the 50-lake frame. This 150-lake sample will allow for statewide and ecoregion-based assessment. MDNR will explore development of zooplankton-based indices as a part of this work.
- Physical-habitat (P-hab) data were collected as a part of the 2007 NLA and were collected again in 2012. However, there has been no analysis or reporting of this data for Minnesota. MDNR will analyze physical-habitat data from 2007 & 2012 NLA surveys. The analysis will consider other lake and water quality characteristics and evaluate the broader application of this data for lake assessment in Minnesota.
- Macrophyte forms, relative abundance, and depth of colonization will be assessed as part of P-Hab work on 50 lakes. MDNR will evaluate and report on this data and make recommendations on the potential application of this approach in conjunction with Minnesota's water quality and plant assessments.
- An analysis of water chemistry data from the 2007 NLA was conducted based on the statewide 50-lake sample. EPA's Regional EPA Viewer Tool was used prominently in that analysis. We anticipate a similar analysis that features mapping spatial patterns and development of cumulative distribution functions on a statewide and ecoregion basis using the 2012 NLA data from all 150 lakes. Since MDH water quality data will be combined with EPA water quality data, split samples were collected on a subset of the lakes to ensure comparability of data between the two laboratories. A similar exercise in 2007 indicated good comparability for most parameters.
- Measurement of emerging contaminants was done by the MPCA. A select list of emerging contaminants was monitored in the 50-lake sample. A statistical assessment and description of presence/absence of these contaminants at the state level will be one outcome from this effort.

Based on our experience and reporting on the 2007 NLA data, there will likely be numerous other applications of the 2012 NLA data. We have chosen to highlight those projects/analyses that will be initiated and to a large degree completed using funding from the 2012 NLA or are contributions made by our partners.

Figure 6. Map of 2012 Minnesota NLA lakes overlain on Level III ecoregion map. Map denotes "Federal" lakes (1st 50) which had complete assessments and "State" (100 lakes, also referred to as ecoregion) which were added to allow for ecoregion–based analysis. Aggregated Level III ecoregions as follows: Northern Forests (NLF and NMW), East Temperate Forests (NCHF and DA), and Great Plains (WCBP, NGP, and LAP).

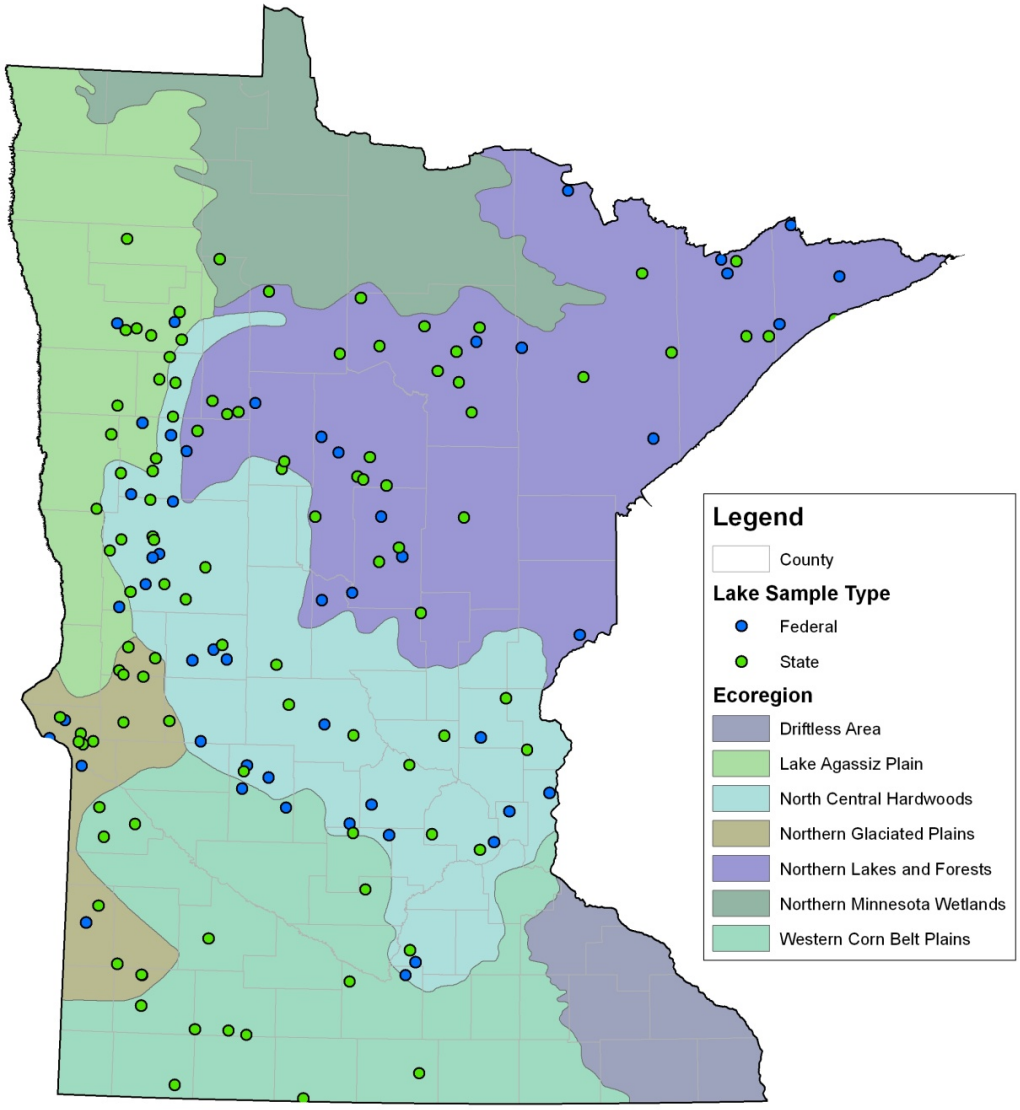
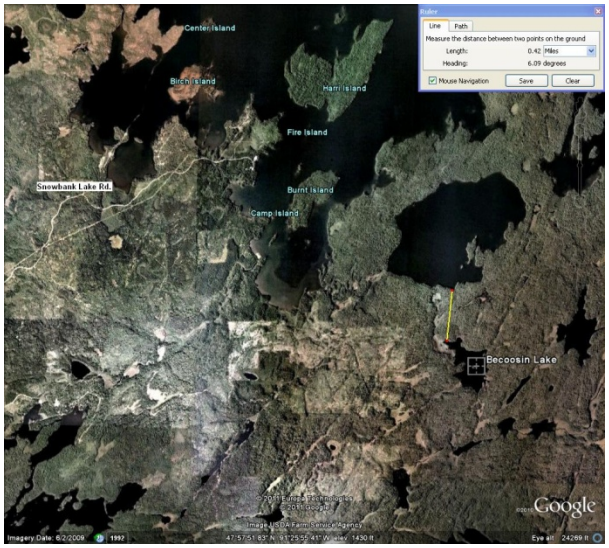


Figure 7. Sampling-related photos: a) Sampling on a remote BWCAW lake (NLA12_MN-105): map of access to lake and sediment core collection and processing with two canoes strapped together.



b) Sampling NLA12_MN-206 Miskogineu Lake with Shane Bowe, Red Lake DNR. Argo ATV used to cross the bog, view from Argo, and Shane on the lake

c) Benthos, zooplankton, and rake tow collections

d) Shallow lake sampling

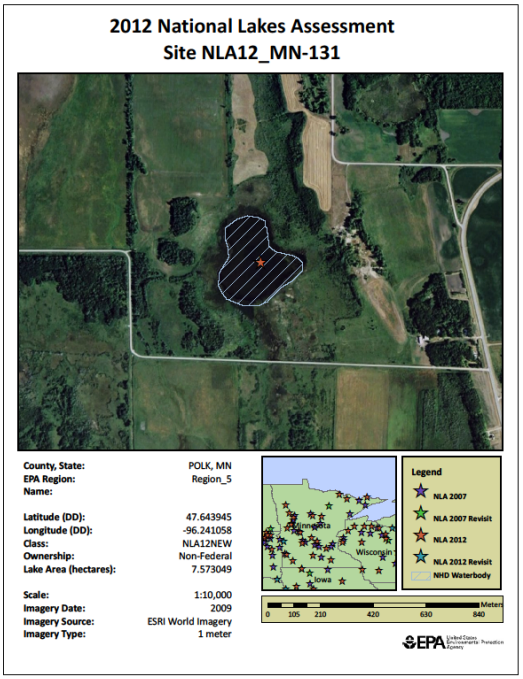


Figure 8. Minnesota NLA lakes dropped from 2012 survey. Basis for deletion: 1) "Dry" implies too shallow, no open water, or completely dry; and 2) "Other" includes all other reasons such as access denial, non-target, etc.

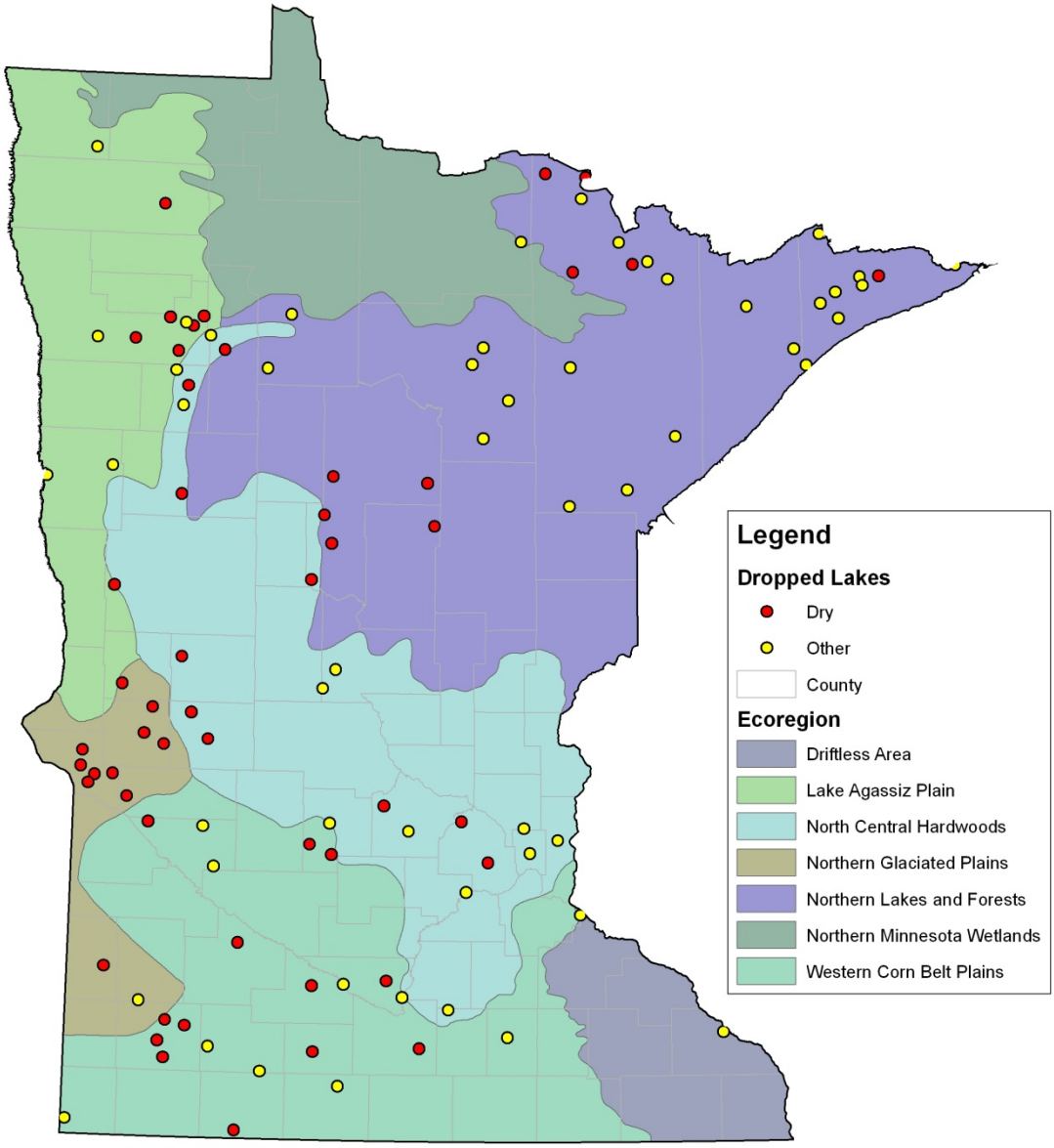


Figure 9. Examples of drought-impacted lakes. a) NLA12_MN-427 (North basin Thielke Lake) and b) NLA12_MN-444 (South Badger) cattail covered

a

b

Figure 10. U.S. drought severity map for Minnesota. Derived from Western Regional Climate Center

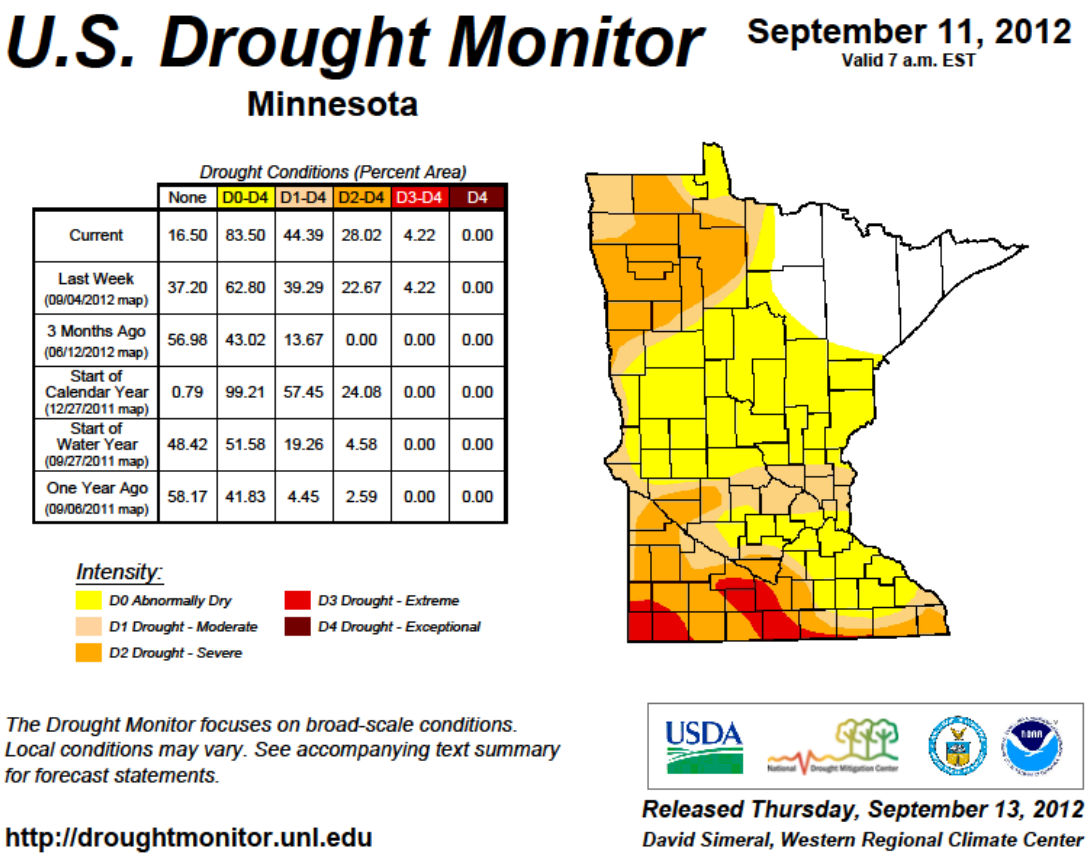


Table 3. Minnesota 2012 NLA analytes and measurements. Sample collection at mid-lake index (I) or littoral (L)

Measurement	National/state (50 lakes)	Ecoregion (100 lakes)
Water chemistry (nutrients, cations, anions & organic carbon)	I	I
Chlorophyll-a	I,L	I
Secchi	I	I
Profiles: DO, temperature, conductivity & pH	I	I
Microcystin	I, L	I
Triazine assay	I	I
Phytoplankton	I, L	
Zooplankton (varies among lakes, may include 50, 150, 80 & 183 µm) MDNR 80 µm for all	I	I
Sediment cores & dating	I	
Physical habitat assessment	10 sites	
Macrophyte forms & depth of colonization	5 sites	

Table 4. List of Minnesota's 2012 NLA lakes, includes original panel and adjustments made following replacements. Notes 50-lake "national" frame & 100-lake "state" ecoregion frame

#	Site ID	Original Panel	Adjusted Panel	DOW Lake #	Name	County	Eco code
National frame							
1	NLA12_MN-101	NLA07RVT2	NLA07RVT2	31026601	Long Lake	Itasca	50
2	NLA12_MN-102	NLA07RVT	NLA07RVT	69012900	Spring Lake	St. Louis	50
3	NLA12_MN-103	NLA07RVT	NLA07RVT	18012300	Lookout Lake	Crow Wing	50
4	NLA12_MN-104	NLA07RVT	NLA07RVT	56035600	Fairy Lake	Otter Tail	51
5	NLA12_MN-105	NLA07RVT	NLA07RVT	38047200	Becoosin Lake	Lake	50
6	NLA12_MN-106	NLA07RVT	NLA07RVT	21008000	Lake Darling	Douglas	51
7	NLA12_MN-107	NLA07RVT	NLA07RVT	86026300	Cokato Lake	Wright	51
8	NLA12_MN-108	NLA07RVT	NLA07RVT	11048000	Long Lake	Cass	50
9	NLA12_MN-109	NLA07RVT	NLA07RVT	16064300	Richey Lake	Cook	50
10	NLA12_MN-110	NLA07RVT	NLA07RVT	18015500	Crow Wing Lake	Crow Wing	50
11	NLA12_MN-111	NLA07RVT	NLA07RVT	62007300	Snail Lake	Ramsey	51
12	NLA12_MN-112	NLA07RVT	NLA07RVT	07-0060-01	Eagle (North)	Blue Earth	51
13	Site ID	NLA07RVT	NLA07RVT	41005500	North Ash	Lincoln	46
14	NLA12_MN-114	NLA07RVT	NLA07RVT	34014100	Woodcock Lake	Kandiyohi	51
15	NLA12_MN-115	NLA07RVT	NLA07RVT	56047600	Round Lake	Otter Tail	51
16	NLA12_MN-116	NLA07RVT	NLA07RVT	27001900	Lake Nokomis	Hennepin	51
17	NLA12_MN-118	NLA07RVT	NLA07RVT	43001400	South Lake	Mcleod	51
18	NLA12_MN-119	NLA07RVT	NLA07RVT	06015200	Big Stone Lake	Roberts	46
19	NLA12_MN-120	NLA07RVT	NLA07RVT	03024200	Flat Lake	Becker	50
20	NLA12_MN-121	NLA07RVT	NLA07RVT	34025100	Norway Lake	Kandiyohi	51
21	NLA12_MN-122	NLA07RVT	NLA07RVT	47001500	Lake Jennie	Meeker	51
22	NLA12_MN-123	NLA12RVT	NLA12RVT	06-0460-00	Unnamed Pool	Big Stone	46
23	NLA12_MN-126	NLA12NAT	NLA12NAT	11101300	Diamond Pond	Cass	50
24	NLA12_MN-127	NLA12NAT	NLA12NAT	56081000	(56-0810)	Otter Tail	48
25	NLA12_MN-130A	NLA12NAT	NLA12NAT	69075700	Net Lake	St. Louis	50
26	NLA12_MN-131	NLA12NAT	NLA12NAT	60031900		Polk	48
27	NLA12_MN-132	NLA12NAT	NLA12NAT	73017200	Clear Lake	Stearns	51
28	NLA12_MN-135	NLA12NAT	NLA12NAT	34029400	Lindgren	Kandiyohi	47
29	NLA12_MN-136	NLA12NAT	NLA12NAT	21-0729-00	Unnamed	Douglas	51
30	NLA12_MN-137	NLA12NAT	NLA12NAT	03057100	Cucumber Lake	Becker	48
31	NLA12_MN-138A	NLA12NAT	NLA12NAT	16-0613	Tenor	Cook	50
32	NLA12_MN-141	NLA12NAT	NLA12NAT	56057300	East Red River	Otter Tail	51
33	NLA12_MN-143	NLA12ST	NLA12NAT	03075100	03075100	Becker	51
34	NLA12_MN-144	NLA12ST	NLA12NAT	18-0312-02	Sandcrest Bay of Cross L	Crow Wing	50
35	NLA12_MN-145	NLA12ST	NLA12NAT	82003100	Terrapin Lake	Washington	51
36	NLA12_MN-147	NLA12ST	NLA12NAT	58004500	Wilbur Lake	Pine	50
37	NLA12_MN-150	NLA12ST	NLA12NAT	38062300	Spree Lake	Lake	50

38	NLA12_MN-152	NLA12ST	NLA12NAT	61009100	61-0091	Pope	51
39	NLA12_MN-153	NLA12ST	NLA12NAT	03030300	Bear Lake	Becker	51
40	NLA12_MN-157	NLA12ST	NLA12NAT	56062900	Glorvigan Lake	Otter Tail	51
41	NLA12_MN-158	NLA12ST	NLA12NAT	60009900	60-0099	Polk	48
42	NLA12_MN-160	NLA12ST	NLA12NAT	49013900	49-0139	Morrison	50
43	NLA12_MN-162	NLA12ST	NLA12ST	69092000	Waymier Lake	St. Louis	50
44	NLA12_MN-163	NLA12ST	NLA12ST	30007200	Long Lake	Isanti	51
45	NLA12_MN-167	NLA12ST	NLA12ST	34003300	Ella Lake	Kandiyohi	47
46	NLA12_MN-170A	NLA12ST	NLA12ST	16-0182-00	Ball Club	Cook	50
47	NLA12_MN-171	NLA12ST	NLA12ST	06034900	06-0349	Big Stone	46
48	NLA12_MN-177	NLA12ST	NLA12ST	40009800	40-0098	Le Sueur	51
49	NLA12_MN-180	NLA12ST	NLA12ST	21-0199-02	East Crooked Lake	Douglas	51
50	NLA12_MN-181	NLA12ST	NLA12ST	29030300	Lost Lake	Hubbard	50

Ecoregion frame

1	NLA12_MN-178A	NLA12ST	State	69029600	Little Crab	St. Louis	50
2	NLA12_MN-184	NLA12ST	State	56049000	Round Lake	Otter Tail	51
3	NLA12_MN-185	NLA12ST	State	04001400	Popple Lake	Beltrami	50
4	NLA12_MN-186	NLA12ST	State	22002200	South Walnut Lake	Faribault	47
5	NLA12_MN-187	NLA12ST	State	37013402	Unnamed	Lac Qui Parle	47
6	NLA12_MN-189	NLA12ST	State	03039300	(03-0393)	Becker	51
7	NLA12_MN-191	NLA12ST	State	56085300	(56-0853)	Otter Tail	51
8	NLA12_MN-195	NLA12ST	State	57-0027-01	Unnamed (North)	Pennington	48
9	NLA12_MN-196	NLA12ST	State	73024100	Black Oak Lake	Stearns	51
10	NLA12_MN-197	NLA12ST	State	60007800	Solbery Lake	Polk	48
11	NLA12_MN-199	NLA12ST	State	34032100	Swenson Lake	Kandiyohi	51
12	NLA12_MN-200	NLA12ST	State	77025800		Todd	51
13	NLA12_MN-201	NLA12ST	State	44052800	(44-0528)	Mahnomen	51
14	NLA12_MN-202	NLA12ST	State	38051000	Cattyman Lake	Lake	50
15	NLA12_MN-203	NLA12ST	State	26022800	Hodgson Lake	Grant	46
16	NLA12_MN-204	NLA12ST	State	17002400	String (17-0024)	Cottonwood	47
17	NLA12_MN-205	NLA12ST	State	56011300	(56-0113)	Otter Tail	51
18	NLA12_MN-206	NLA12ST	State	15010700	Miskogineu Lake	Clearwater	49
19	NLA12_MN-207	NLA12ST	State	03062700	(03-0627)	Becker	51
20	NLA12_MN-211	NLA12ST	State	30006000	Section Lake	Isanti	51
21	NLA12_MN-212	NLA12ST	State	73031700	(73-0317)	Stearns	51
22	NLA12_MN-213A	NLA12ST	State	44014000	Circle	Mahnomen	51
23	NLA12_MN-214	NLA12ST	State	69005000	Big Lake	St. Louis	50
24	NLA12_MN-215	NLA12ST	State	37-0026-01	Unnamed (North)	Lac Qui Parle	47
25	NLA12_MN-217	NLA12ST	State	15027900	(15-0279)	Clearwater	50
26	NLA12_MN-218A	NLA12ST	State	38002400	Crooked	Lake	50

27	NLA12_MN-219	NLA12ST	State	06026600	(06-0266)	Big Stone	46
28	NLA12_MN-220	NLA12ST	State	51007900	(51-0079)	Murray	46
29	NLA12_MN-221	NLA12ST	State	56043000	Fiske Lake	Otter Tail	51
30	NLA12_MN-227	NLA12ST	State	71004400	Little Diann Lake	Sherburne	51
31	NLA12_MN-228	NLA12ST	State	26-0043-02	Unnamed (West Portion)	Grant	46
32	NLA12_MN-229A	NLA12ST	State	15-0491-00	Unnamed	Clearwater	50
33	NLA12_MN-233	NLA12ST	State	31-1366-00	Unnamed	Itasca	50
34	NLA12_MN-235	NLA12ST	State	06020600	(06-0206)	Big Stone	46
35	NLA12_MN-236	NLA12ST	State	40010700	Savidge Lake	Le Sueur	51
36	NLA12_MN-237	NLA12ST	State	27002900	Lake Edina	Hennepin	51
37	NLA12_MN-240	NLA12ST	State	48001900	(48-0019)	Morrison	50
38	NLA12_MN-243	NLA12ST	State	01010000	Jenkins Lake	Aitkin	50
39	NLA12_MN-245	NLA12ST	State	29014400	Sunday Lake	Hubbard	51
40	NLA12_MN-247	NLA12ST	State	72005000	High Island Lake	Sibley	47
41	NLA12_MN-248	NLA12ST	State	56049200	Horseshoe Lake	Otter Tail	51
42	NLA12_MN-249	NLA12ST	State	31089300	Lower Pigeon Lake	Itasca	50
43	NLA12_MN-250	NLA12ST	State	53002400	Ocheda Middle Bay	Nobles	47
44	NLA12_MN-251	OverSamp	State	37010000		Lac Qui Parle	47
45	NLA12_MN-252	OverSamp	State	43007600	Bear Lake	Mcleod	51
46	NLA12_MN-253	OverSamp	State	56057800	Holbrook Lake	Otter Tail	51
47	NLA12_MN-254	OverSamp	State	11024100	Tamarack Lake	Cass	50
48	NLA12_MN-255	OverSamp	State	56098500		Otter Tail	51
49	NLA12_MN-256	OverSamp	State	11015000	Tamarack Lake	Cass	50
50	NLA12_MN-258	OverSamp	State	31029800	Walters Lake	Itasca	50
51	NLA12_MN-264	OverSamp	State	21006000	Kruegers Slough	Douglas	51
52	NLA12_MN-265	OverSamp	State	03041400	Gandrud Lake	Becker	51
53	NLA12_MN-267	OverSamp	State	26020500		Grant	46
54	NLA12_MN-268	OverSamp	State	17006000	Talcott	Cottonwood	47
55	NLA12_MN-269	OverSamp	State	56014700		Otter Tail	51
56	NLA12_MN-271	OverSamp	State	56158200		Otter Tail	51
57	NLA12_MN-272A	OverSamp	State	18041800	Pennington Pit Lake	Crow Wing	50
58	NLA12_MN-274	OverSamp	State	31040700	Hay Lake	Itasca	50
59	NLA12_MN-277A	OverSamp	State	44024400	Unnamed	Mahnomen	48
60	NLA12_MN-280	OverSamp	State	61018900		Pope	46
61	NLA12_MN-281	OverSamp	State	03023600		Becker	50
62	NLA12_MN-283	OverSamp	State	75020500		Stevens	46
63	NLA12_MN-284	OverSamp	State	64009600		Redwood	47
64	NLA12_MN-287	OverSamp	State	14008100	Unnamed	Clay	48
65	NLA12_MN-288	OverSamp	State	11044000		Cass	50
66	NLA12_MN-290	OverSamp	State	31021100	Becker Lake	Itasca	50

67	NLA12_MN-293	OverSamp	State	15-0213-02	Unnamed (South Portion)	Clearwater	50
68	NLA12_MN-297	OverSamp	State	31-1367-00	Unnamed	Itasca	50
69	NLA12_MN-299	OverSamp	State	06009001	Bentsen Lake	Big Stone	46
70	NLA12_MN-300	OverSamp	State	07012400	Lieberg Lake	Blue Earth	47
71	NLA12_MN-303	OverSamp	State	60027500	Unnamed	Polk	48
72	NLA12_MN-304	OverSamp	State	18052700		Crow Wing	50
73	NLA12_MN-306A	Replace	State	38067100	Two Deer		50
74	NLA12_MN-313	OverSamp	State	29014600	Lake Belle Taine	Hubbard	50
75	NLA12_MN-315	OverSamp	State	41004400	41004400	Lincoln	46
76	NLA12_MN-316A	OverSamp	State	51007900	Iron	Murray	47
77	NLA12_MN-318	OverSamp	State	11-1033-00	Unnamed	Cass	50
78	NLA12_MN-320	OverSamp	State	11011000	Pistol Lake	Cass	50
79	NLA12_MN-322A	OverSamp	State	31041900	Charlie Lake	Itasca	50
80	NLA12_MN-325	OverSamp	State	44022800	44022800	Mahnomen	48
81	NLA12_MN-334	OverSamp	State	04025100	Fox Lake	Beltrami	50
82	NLA12_MN-335	OverSamp	State	14-0389-00	Unnamed	Clay	48
83	NLA12_MN-338	OverSamp	State	31059400	Cottonwood Lake	Itasca	50
84	NLA12_MN-341	OverSamp	State	60021100	Engemoen Lake	Polk	48
85	NLA12_MN-342	OverSamp	State	69065300	Long Lake	St. Louis	50
86	NLA12_MN-367	OverSamp	State	60-0281-00	Unnamed	Polk	48
87	NLA12_MN-378	OverSamp	State	46009800	Dutton Slough	Martin	47
88	NLA12_MN-273	OverSamp	State	27017901	North Little Long	Hennepin	51
89	NLA12_MN-395	OverSamp	State	26021700		Grant	46
90	NLA12_MN-396A	OverSamp	State	17007300	Summitt	Cottonwood	47
91	NLA12_MN-415	OverSamp	State	54001300	Home	Norman	48
92	NLA12_MN-275	OverSamp	State	13006100		Chisago	51
93	NLA12_MN-346	OverSamp	State	38025600	Divide Lake	Lake	50
94	NLA12_MN-420	OverSamp	State	75016400	Silver Lake	Grant	46
95	NLA12_MN-414A	OverSamp	State	60012900	Syverson	Polk	48
96	NLA12_MN-427A	OverSamp	State	06010200	Thielke	Big Stone	46
97	NLA12_MN-444A	OverSamp	State	51006800	Summitt	Murray	47
98	NLA12_MN-443	OverSamp	State	42007000	East Twin Lake	Lyon	46
99	NLA12_MN-276	OverSamp	State	86006500		Wright	51
100	NLA12_MN-475	OverSamp	State	06025100	Taffe Pond	Big Stone	46