LOON LAKE
HYDRO ACOUSTIC
SPRING SURVEY RESULTS AND TREATMENT DATA
2012

MARINE BIOCHEMISTS
6302 W. Eastwood Drive
Mequon, WI

Survey and Treatment Background

Hydro acoustics utilizes sound energy to detect objects and contours underwater. By integrating digital echo sounders with computer processors, GPS (Global Positioning System) data and GIS (geographical information system) software, graphic representation can be generated of bathymetry (depth contours and shape), fisheries, bottom sediment type, and submersed aquatic vegetation coverage and height within the water column.

On April 10, 2012, a hydro acoustic survey was conducted on Loon Lake, Shawano County, WI. Bathymetry and Submersed Aquatic Vegetation (SAV) data was generated, processed, and then graphically represented.

Utilizing GPS-interfaced imagery, navigation transects of the lake were made with an average of 75 to 100 feet between transects depending on the depth. This pattern allowed for complete mapping of the lake within 30 to 50 feet of the shoreline areas. Docks, wetland emergent vegetation, and shallow depths limited some near-shore areas.

Over 140,000 individual soundings were taken during the survey. These were analyzed and processed into over 6,200 individual data points for each survey, which were extrapolated into graphic representation of the bathymetry and SAV findings. An additional 1272 shoreline and elevation points were marked for further delineation.

Treatment of Loon Lake occurred on April 17, 2012 utilizing the Loon Lake Management District's predetermined treatment areas, chemicals, and chemical amounts. Weather was overcast with mild winds and temperatures in the upper 40's to low 50's. The following pages contain:

- Survey and Treatment Discussion
- Survey Transect and Treatment Area Track Data
- Bathymetry Map
- Submerged Aquatic Vegetation Mean Canopy Height Map
- Submerged Aquatic Vegetation Height Map
- Submerged Aquatic Vegetation Percent Cover Map
- Treatment Areas, Treatment Acreages with Chemicals, and Application Rates

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6302 W. Eastwood Court
Mequon, WI 53022
262-238-0406
www.marinebiochemists.com

Survey and Treatment Discussion

The result of the hydro acoustic survey shows an uneven bottom contour with shallow areas from the island extending eastward and then two sand bar areas east and southeast of the island. Maximum depth on April 10, 2012 was 22.07 feet, and average depth was calculated at 9.43 feet. The surface acreage was calculated at 323.5 acres with a calculated volume on April 10, 2012 of 3050.82 acre-feet. The calculated surface area was greater than historical listings, but is consistent with satellite imagery. Photos of the water level of the lake were taken on the initial survey day as shown below for reference.

The pre-treatment Submersed Aquatic Vegetation (SAV) maps show very low growing plants mostly in the intended treatment areas. Active growth of the target species, Eurasian Watermilfoil (EWM), was observed on day of survey via rake samples. The Mean Canopy Height Map shows the SAV plant height multiplied by the percent coverage of SAV in the area. This is a calculated method for incorporating the SAV height and SAV percent coverage in a single parameter.

The treatment on April 17, 2012 occurred without incident. The treatment boat utilized weighted drop lines to disperse the products below the surface eliminating any potential of airborne spray drift. Water use restrictions for DMA-4IVM were posted at every property on the lake. An additional survey of the lake is planned for mid-May of 2012 to document any changes since the treatment on April 17, 2012. Volume data was adjusted for the conditions observed on treatment day.

Variations or additional copies of the survey maps are available upon request. Additional hydro acoustic surveys of the lake are also available at a reduced rate should the district wish to examine late season growth.

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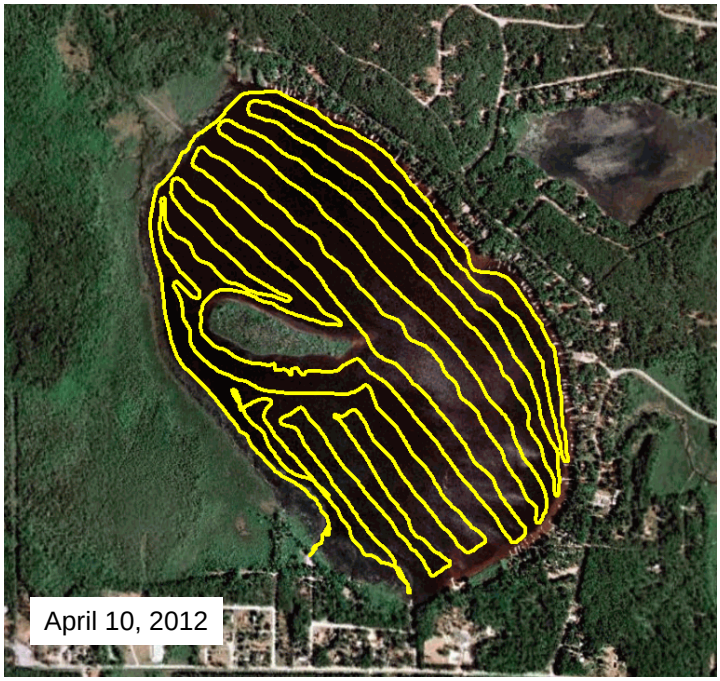
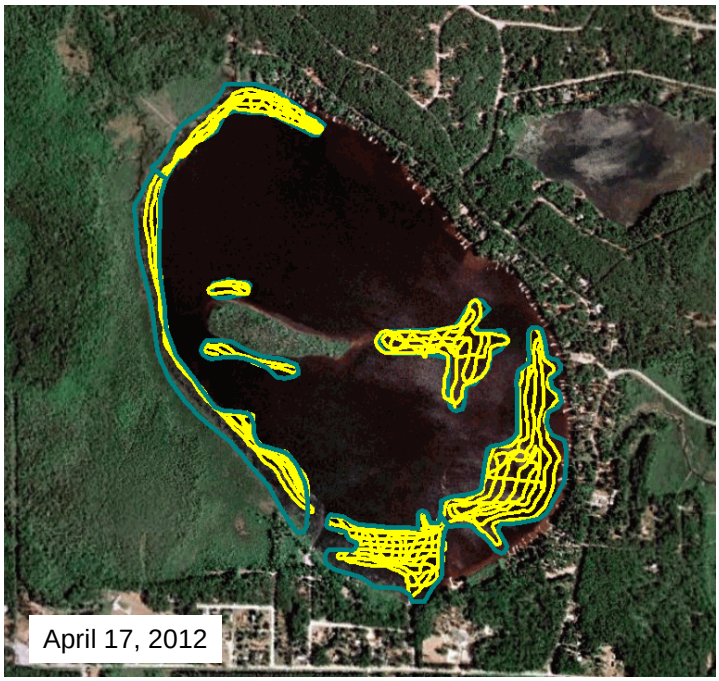
Survey and Treatment Transect Data



Approximate Survey Track Data overlaid on satellite imagery



Approximate Treatment Track Data overlaid on satellite imagery

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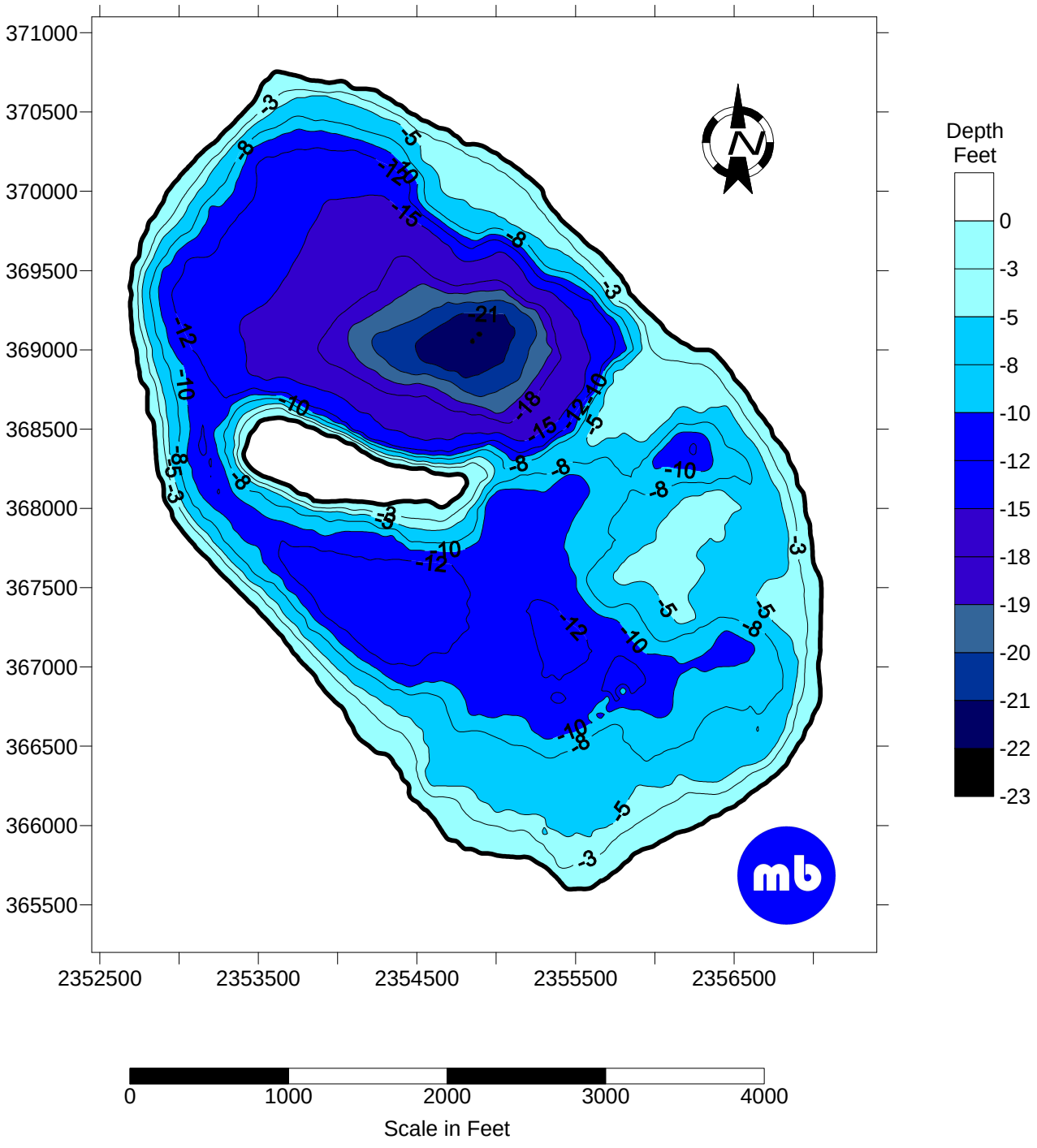
Loon Lake, WI - April 10, 2012
Bathymetry-Feet
Wisconsin State Plane North - NAD83



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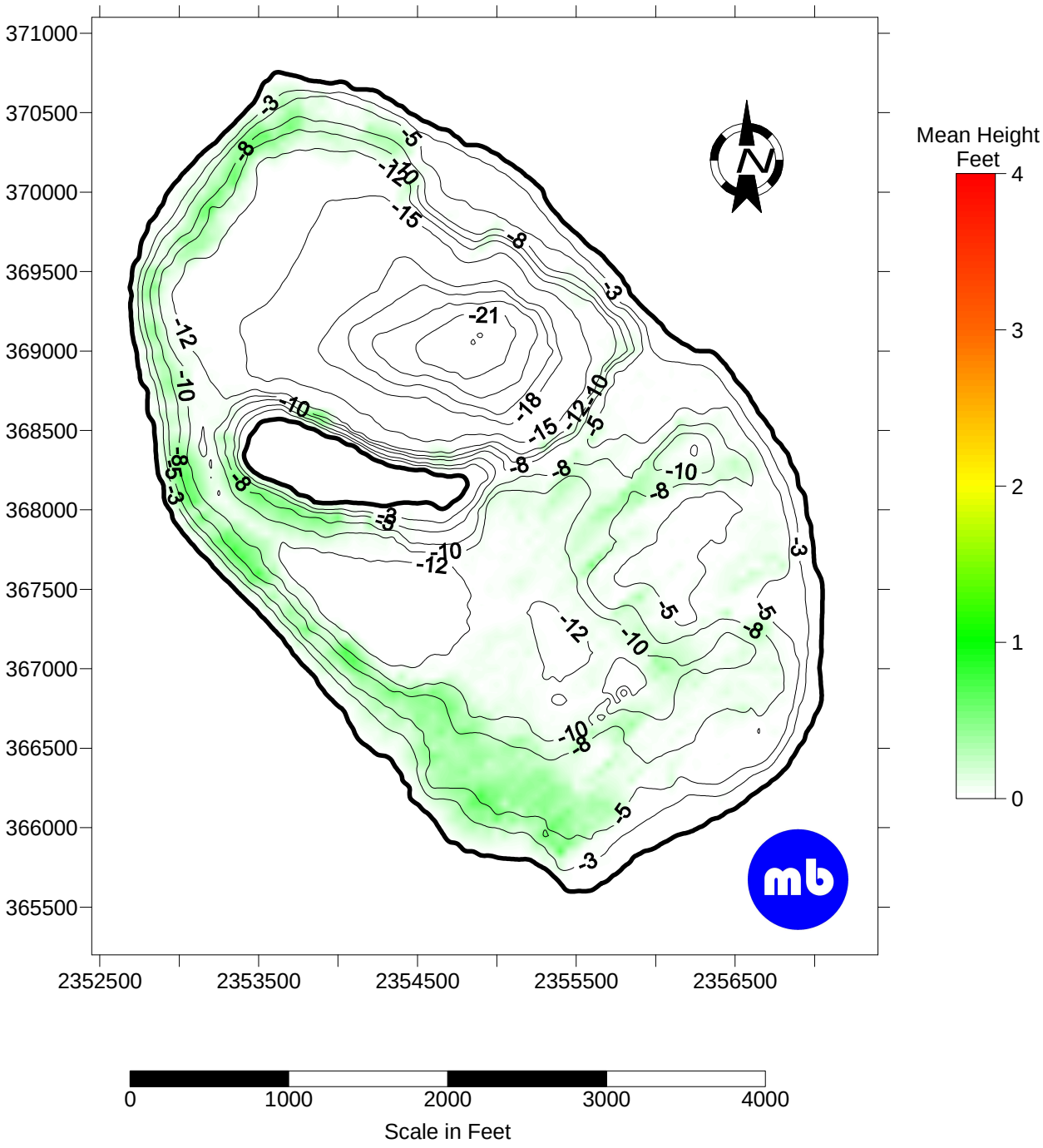
Loon Lake, WI - April 10, 2012
Submersed Aquatic Vegetation Mean Canopy Height
Wisconsin State Plane Central- NAD83



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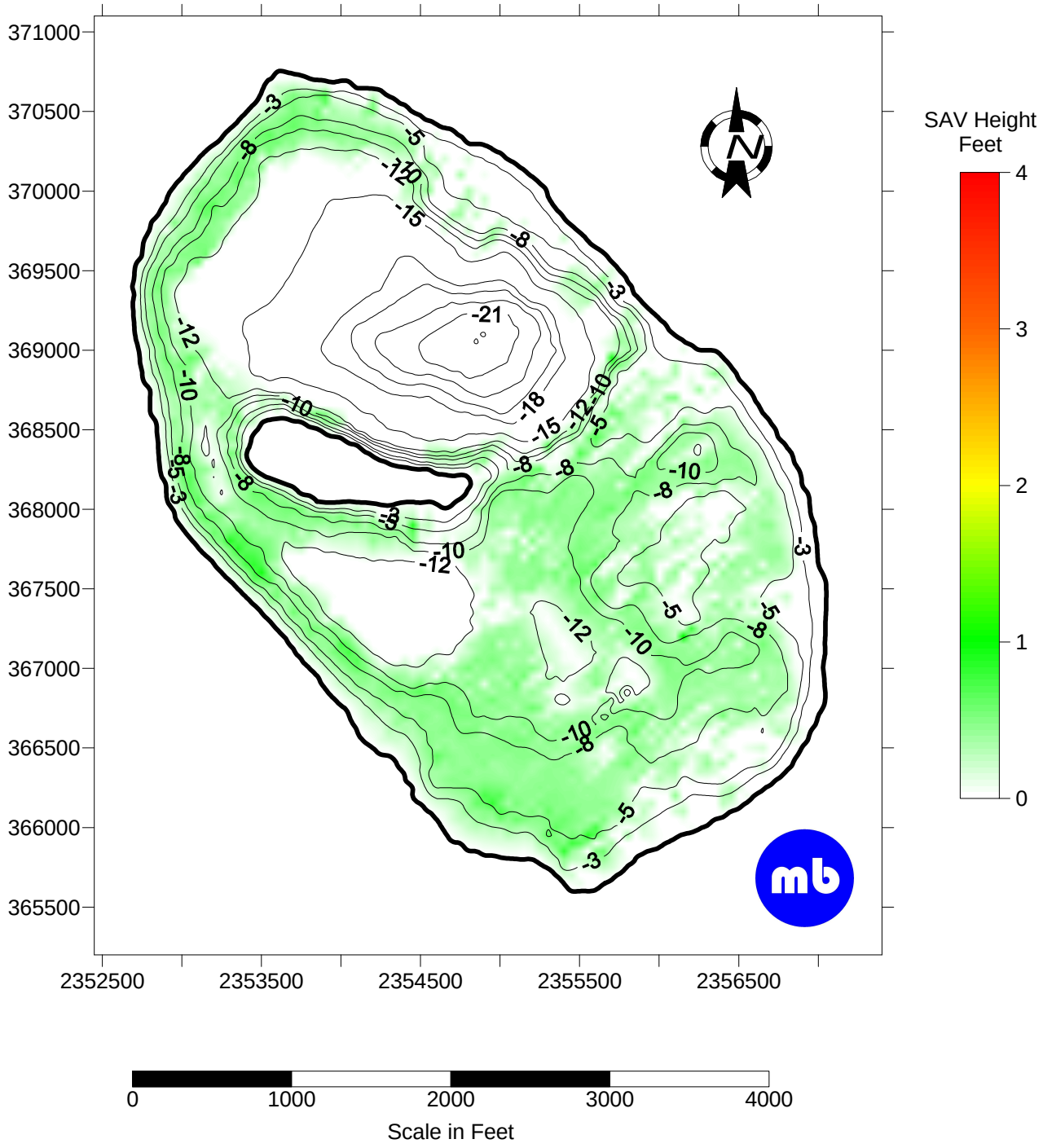
Loon Lake, WI - April 10, 2012
Submersed Aquatic Vegetation Height
Wisconsin State Plane Central- NAD83



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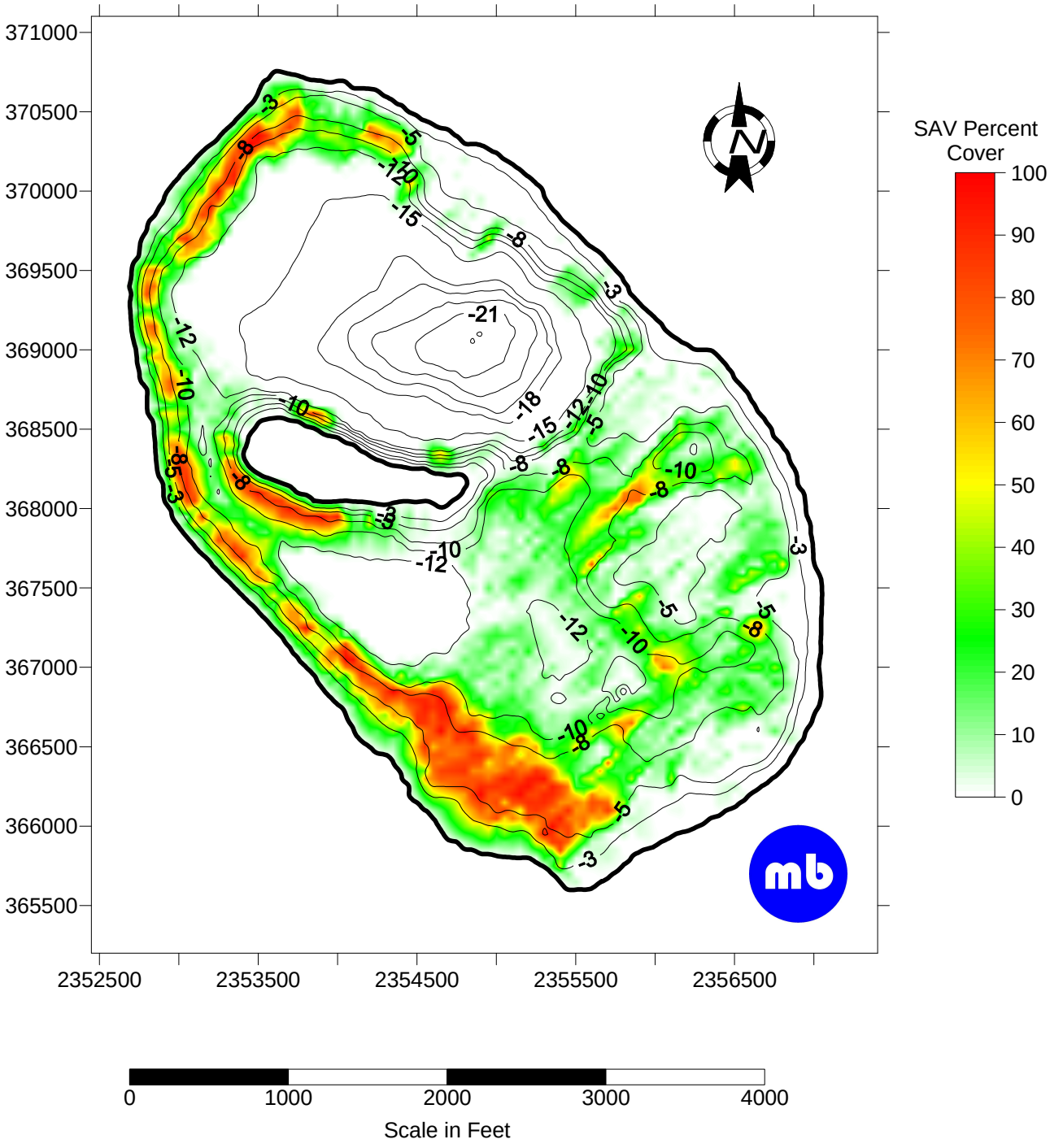
Loon Lake, WI - April 10, 2012
Submersed Aquatic Vegetation Percent Coverage
Wisconsin State Plane Central- NAD83



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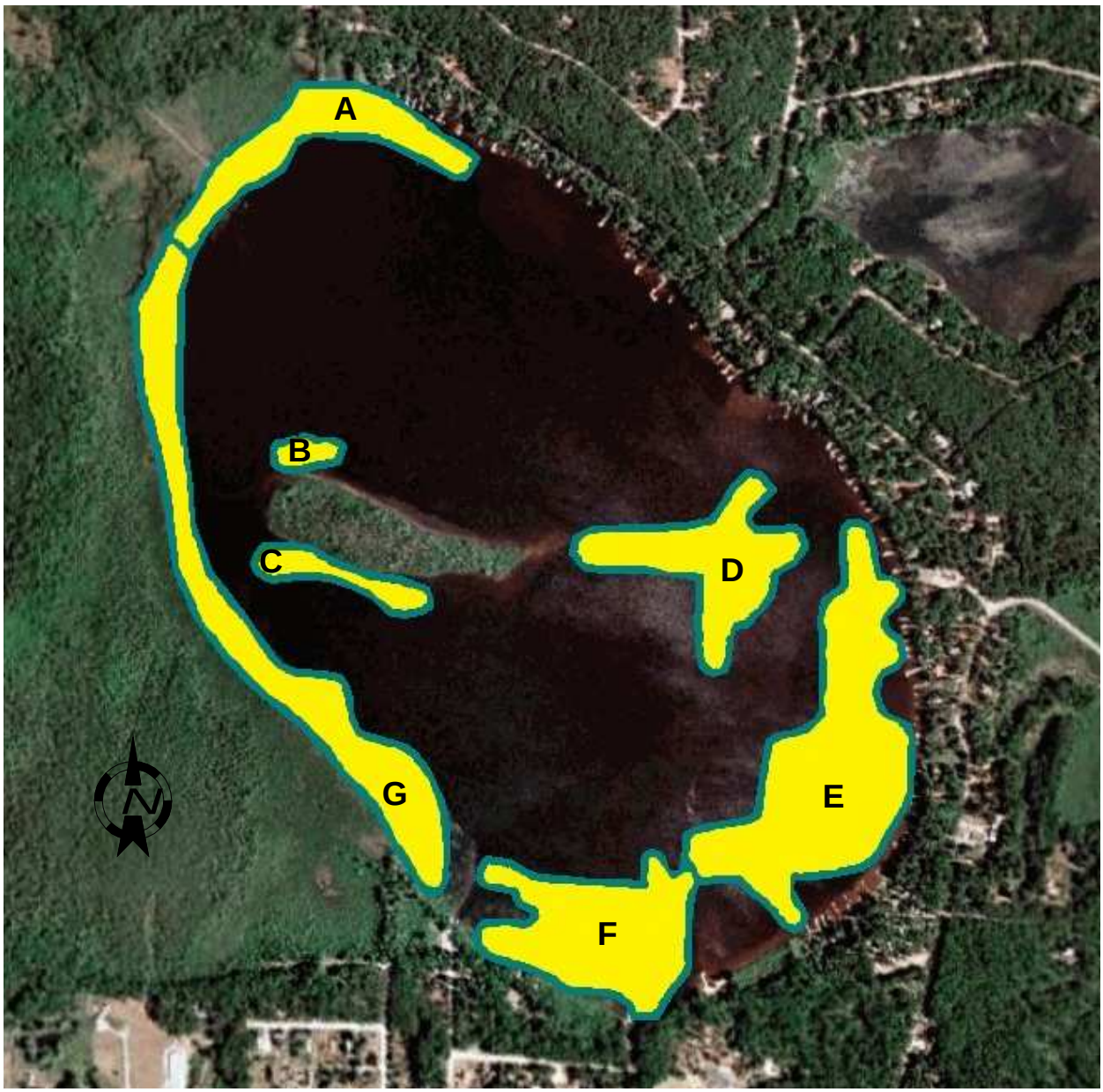

Treatment Area	Area Location	Acres	Ave. Depth
A	North Area	13.8	5.5
B	North Island Area	1.60	5.5
C	South Island Area	2.5	5.5
D	East Central Area	11.4	5.5
E	SE Area	20	5.5
F	South Area	18.70	5.5
G	West Area	19.60	5.5
	Totals	87.60	

4-17-2012 Treatment Areas and Acreages

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