Class of 1918 Marsh in Winter 2012-2013
Ice and Snow, Habitat for Fishes, and Road Salt

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Center for Limnology, UW Madison and Friends of the Lakeshore Nature Preserve

Preserve Committee Meeting - April 8, 2014
Lakeshore Nature Preserve

Class of 1918 Marsh
Many Helped

Lina Ekholm

Elizabeth Droessler

David Harring

Brena Jones

Ted Bier

Bryn Scriver
Fish Sampling in Late Fall 2012

Total Captured (13 in 29 minnow traps)

Open Water of Marsh (21 traps)
  1 Green Sunfish & 1 Pumpkinseed (young)

South Bridge (3 traps)
  1 Green Sunfish (young)

South Storm Sewer Inlet (2 traps)
  3 Bluntnose Minnows (several ages)

Nielson Pond (1 trap)
  1 Bluegill & 2 Green/Pumpkinseed Hybrids (young)

Storm Sewer Outlet to Lake Mendota (2 traps)
  1 Bluegill & 1 Black Bullhead & Carp & 2 Pumpkinseed (young)
Lowest Oxygen Concentrations

- 0.3 mg/Liter at South Bridge
- 0.4 mg/Liter at South Storm Sewer
- 4.3 mg/Liter at 1918 Marsh
- 4.8 mg/Liter at Outlet to Lake Mendota
- 5.6 mg/Liter at Pond at Pharmacy
- 5.6 mg/Liter at Pharmacy
Depth of Marsh, Ice Thickness, and Depth of Water under the Ice

- Marsh Depth
- Ice Thickness
- Fish Habitat under Ice

Jan 29, 2013

No Water under Ice

Water under Ice
Dissolved Oxygen under Ice

Fish Habitat under Ice
Road Salt, the Snow Pile, and the Preserve’s Class of 1918 Marsh
Sampling Sites
Chloride
Winter 2012-2013

Sta 1 - at storm sewer from south end near the Hospital; just west of entrance to parking lot 82 and just north of sidewalk. Sampled between grates near pipe.

Jan 29, 2013 at 1:16 PM
Mar 2, 2013 at 1:24 PM

Sta 3 - near center of south inlet stream, 0.25 to 1 m upstream from the south edge of bridge.

Jan 12, 2013 at 9:21 AM
Mar 5, 2013 at 3:25 PM

Sta 4 - near center of northeast outlet stream of marsh, 0.25 to 0.5 m west of west edge of bridge to the east path.

Jan 19, 2013 at 3:13 PM
Mar 2, 2013 at 1:19 PM
Sampling Sites
Chloride
Winter 2012-2013

Sta 5 - in the flow west of drain that drops into a storm sewer under the edge of pier just west of the pumphouse. Sample location was often about 1 to 2 m west of drain in the center of the flow or as far out as we could reach from end of the pier when water was high. We avoided the flow coming from Sta 6.

Sta 6 - right at storm drain coming from the east about 15 m east of pumphouse.

Sta 7 - at drain pipe entering University Bay Marsh (Lake Mendota) north of University Bay Drive and pumphouse. Sampled in the flow from pipe if possible, or within 1 m of pipe in main flow when flow was small.
Chloride Concentration in Winter
28 Nov 2012 to 23 May 2013

As a Pollutant USEPA

Drinking Water Taste
200-300 Mg/L
Guideline 20mg/L

EPA Criteria for Continuous Exposure
230 mg/L

Chronic Exposure
(4 days more than once every 3 years)
395 mg/L

Acute Toxicity
757 mg/L
Sometimes the Sources are Obvious
Near the Snowpile

Chloride (mg/Liter)

- Acute
- Chronic
- Taste

Graph showing chloride levels from 12/1/12 to 5/30/13 for different locations: near snowpile, midway, near path, and average (Ave).

Chloride levels:
- Near snowpile: maximum 12,790 mg/Liter
- Midway: fluctuating levels
- Near path: varying levels
- Average: consistent levels
Road Salt 2013

Where’s the balance?

Rick Wenta and Kirsti Sorsa, January 3, 2014
<table>
<thead>
<tr>
<th>City/County</th>
<th>Lane Miles</th>
<th>Salt (tons)</th>
<th>Tons per Lane Mile</th>
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<tbody>
<tr>
<td>City of Fitchburg</td>
<td>256</td>
<td>1640</td>
<td>6.41</td>
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<tr>
<td>City of Madison/Salt route</td>
<td>724</td>
<td>14,915</td>
<td>20.59</td>
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<tr>
<td>City of Madison/Total</td>
<td>1742</td>
<td>14,915</td>
<td>8.56</td>
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<tr>
<td>City of Middleton</td>
<td>150</td>
<td>1431</td>
<td>9.54</td>
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<tr>
<td>City of Monona</td>
<td>68</td>
<td>310</td>
<td>4.56</td>
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<tr>
<td>Dane County (State)</td>
<td>1536</td>
<td>50,488</td>
<td>32.88</td>
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<tr>
<td>Dane County (County)</td>
<td>1250</td>
<td>15,988</td>
<td>12.79</td>
</tr>
</tbody>
</table>
Chloride Concentrations in Smaller Water Bodies

Willow Creek
Dunn’s Marsh

Acute
Chronic
Chloride Concentrations in the Yahara Lakes

Mendota: ca. +3 mg/L per year
Chloride Concentrations in Madison Groundwater Wells from the lower aquifer (deeply cased) and from a mixture of lower and upper aquifers
City of Madison Time Line

1953  Road salt use in Madison began.

1962  Concern was voiced over its environmental impacts.

1973  The Common Council called for a 50% reduction in road salt use for the Lake Wingra watershed.

1978  Madison extended the reduction to the entire City.

1981  Added new recommendations. (see next slide).

2014  Despite gains in application efficiency, the use of road salt for winter road maintenance in Madison continues to grow.

Parking lots constitute about 25% of road salt use in Madison.
After the city-wide expansion of the salt reduction policy in 1978, the Council furthered their recommendations in 1981 by adding, among others:

1. Including other municipalities in the study by furnishing information and adopting sensible salting programs.
2. Monitoring of chloride levels from storm water and private parking lots.
3. Monitoring of discharges, streams, and high-salt zones to capture worst possible conditions.
4. Including the effects of weather in the study.
5. Monitoring of other water contaminants such as heavy metals, nutrients, and sediment.
6. Monitoring of sodium levels.
So what to do?
What is the balance?
For the Preserve
For the University?
For the Friends?
In the long-term the present levels of road salt use are not sustainable by the City, the University, and other governmental, commercial, and private users.

What should we do? Recommend:

1. The University’s use of road salt be included in the city study.
2. The University measure road salt and other contaminants in runoff from parking lots and roads and walkways during winter and summer.
3. The University develop a road salt reduction plan and measurable goals for that plan.
4. University outreach provide information to drivers and pedestrians about the negative aspects of using road salt to begin a development of a balance between human safety and environmental damage.
Chloride Concentrations in Waters Flowing toward the Marsh April 8, 2013

As a Pollutant USEPA

- Drinking Water Taste: 200-300 Mg/L
- Guideline: 20 mg/L

Criteria for Continuous Exposure
- 230 mg/L

Chronic Exposure (4 days more than once every 3 years)
- 395 mg/L

Acute Toxicity (Wisc DNR)
- 757 mg/L
*Plan for the future of road salt use.
*Plan for the future of the Class of 1918 Marsh

*Participate in the Stanley Dodson Audio Field Trip at the Class of 1918 Marsh
Pocket Guide

Stanley Dodson Audio Field Trip at the Class of 1918 Marsh

This field trip in memory of Stanley Dodson was made possible by contributions to, and efforts of, the Friends of the Lakeshore Nature Preserve.

To learn about the marsh
Call 608-327-5715

Press:  For:
20#  Introduction
21#  Geological Origin
22#  Native Americans
23#  A Changing Wetland
24#  Marsh Basics
25#  Cattails
26#  Red-winged Blackbirds
27#  More on Birds

Press:  For:
28#  Toads
29#  Leopard Frogs
30#  Aquatic Insects
31#  Water Fleas
32#  Winter and Ice
33#  Fishes
34#  Hydrology
35#  Future of the Marsh
36#  Overview