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Challenges at the beginning

Farm market was limited

In key county: 12 farms with sales more than \$100,000;
average net income: \$1,397

Isolation from markets makes it harder to sell products
(especially grass hay) – overproduction has meant
not selling products, rather than simply receiving a
lower price

Not many farmers are large enough to capitalize on
economy of scale

Farming areas seeing residential development, less
acceptance of agricultural impacts

Unclear Minnesota laws related to township bans led to
loss of customers



Operational changes produced a higher-quality product, communications changes emphasized benefits

1997: Biosolids program starts with lime-stabilized,
bulk-distribution Class B product

2001: Anaerobic digestion

2001: Mineland program

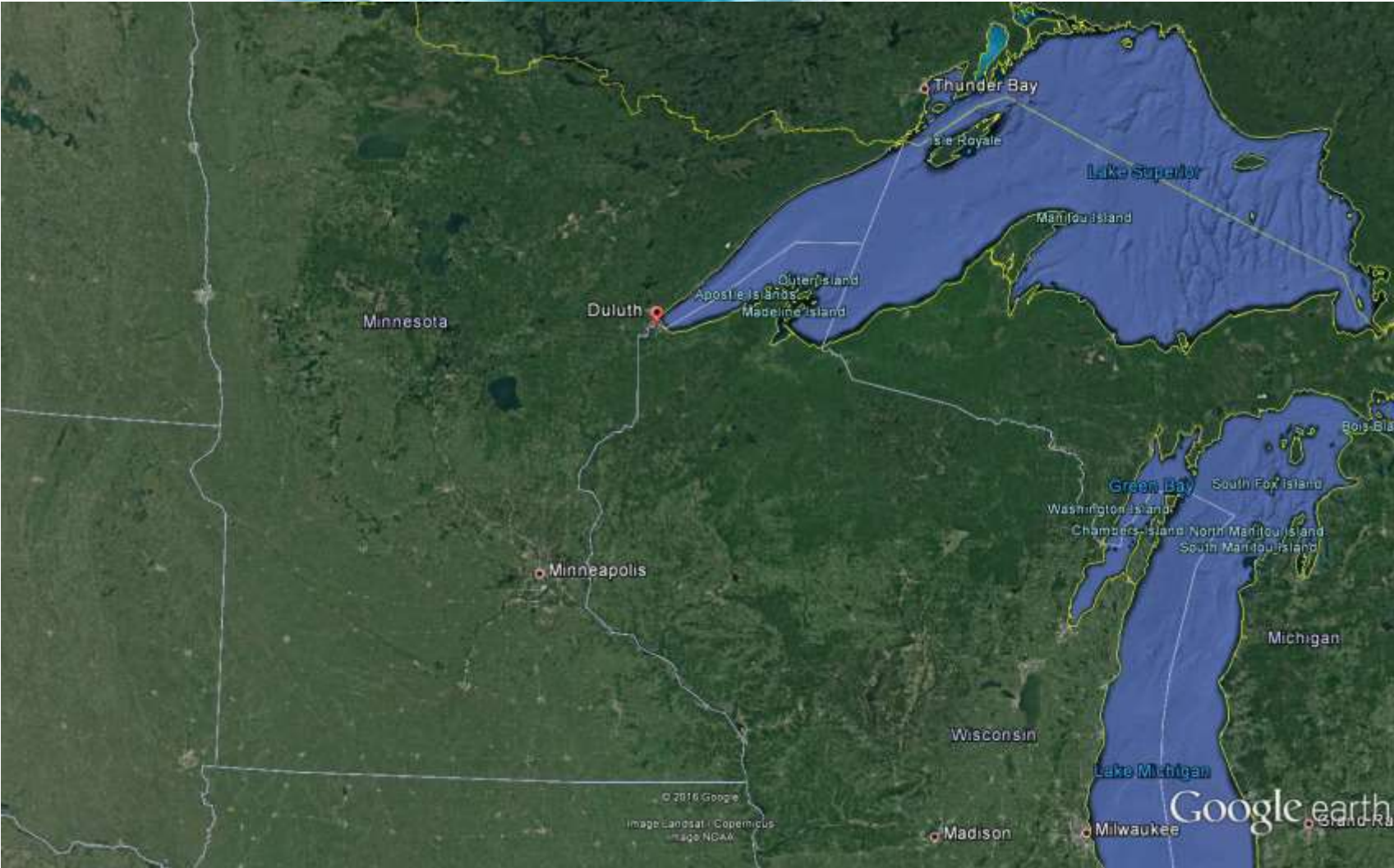
2009: Service fee

2010: Douglas County, Wisc., expansion

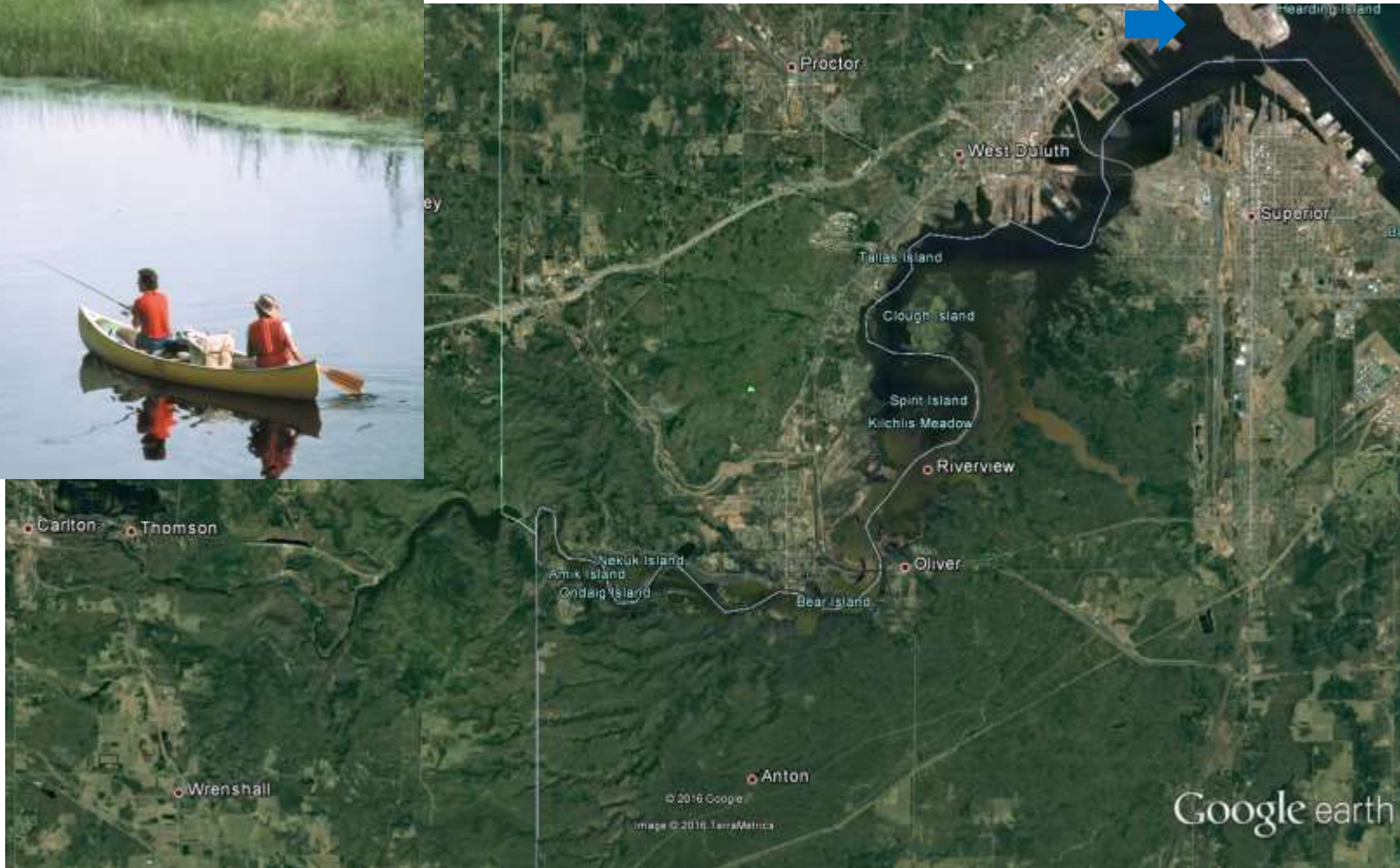
2011: Thermo-thermo staging, odor reduction



WLSSD is located in Duluth, on the border of Minnesota and Wisconsin



Our primary mission is to protect the lower St. Louis River and its estuary, the largest tributary and estuary on the U.S. side of Lake Superior





- Created by the Minnesota legislature in 1971 to protect and improve the waters of the St. Louis River Basin.
- A regional wastewater system serving 17 communities.
- Award-winning wastewater treatment.
- Nationally recognized leader in pollution prevention.

Facts about WLSSD and Field Green

40 mgd plant

Size of plant and biosolids production higher because two pulp-and-paper mills discharge to us: almost 50 percent of influent

Paper mill influent creates more biosolids

Population is about 120,000 in region

75 miles of interceptor pipe

30,000 wet tons of biosolids a year, about 8,000-10,000 dry tons

Operation is staffed internally





Temperature-phased anaerobic digestion

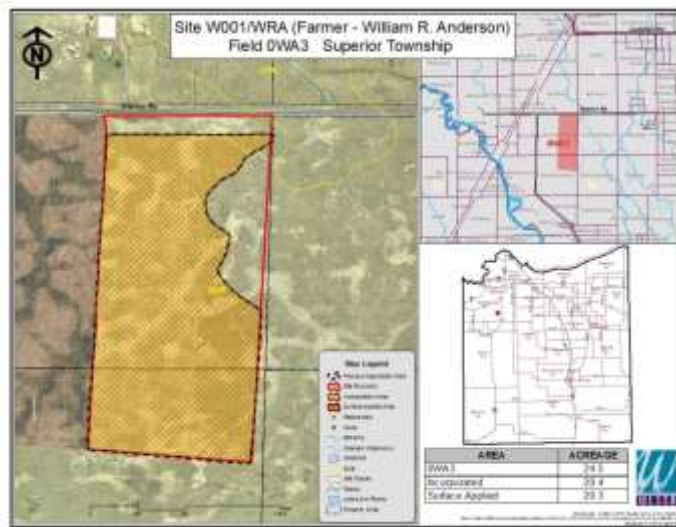
- At the beginning: thermo-meso
- Switched to thermo-thermo-meso
- VSR has reached 60 percent
- Also tweaked centrifuge operation/polymer/ferric use

Result: lower odor product, better acceptance than lime-stabilized product



GIS and GPS technology

- More precise acreages for nutrient calculations
- More efficient in field
- Increased certainty for buffers and setbacks



Customer communications

Nutrient information and suggestions for balancing with other nutrients

All soil tests and maps are sent to customer

We work with farmers to educate neighbors, respond immediately to odor or other complaints



Public communications

Newsletter to farmers, local and state officials, and interested residents twice each year.

Meetings with town boards at key points and upon request.

Attend events like county fairs

Field days with public education and useful information for farmers

Collaborative research with Extension services

Shifted focus to value and benefits of product



Benefits of biosolids



Extension research showed value



At the root of healthy hay



A hay bale is more than grass, clover and alfalfa wrapped with twine. It's the nutrition your livestock and horses need to grow and be healthy. Field Green® biosolids give hay that needed nutrition. Studies* have shown that compared to hay grown without fertilizing, hay grown with Field Green® is:

- Higher in protein
- Easier to digest



FIELD GREEN
The wiser fertilizer™



WLSSD

If you have questions or would like to learn more about biosolids, contact:

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2626 Courtyard Street
Duluth, MN 55806
218-722-3336
www.wlsd.com



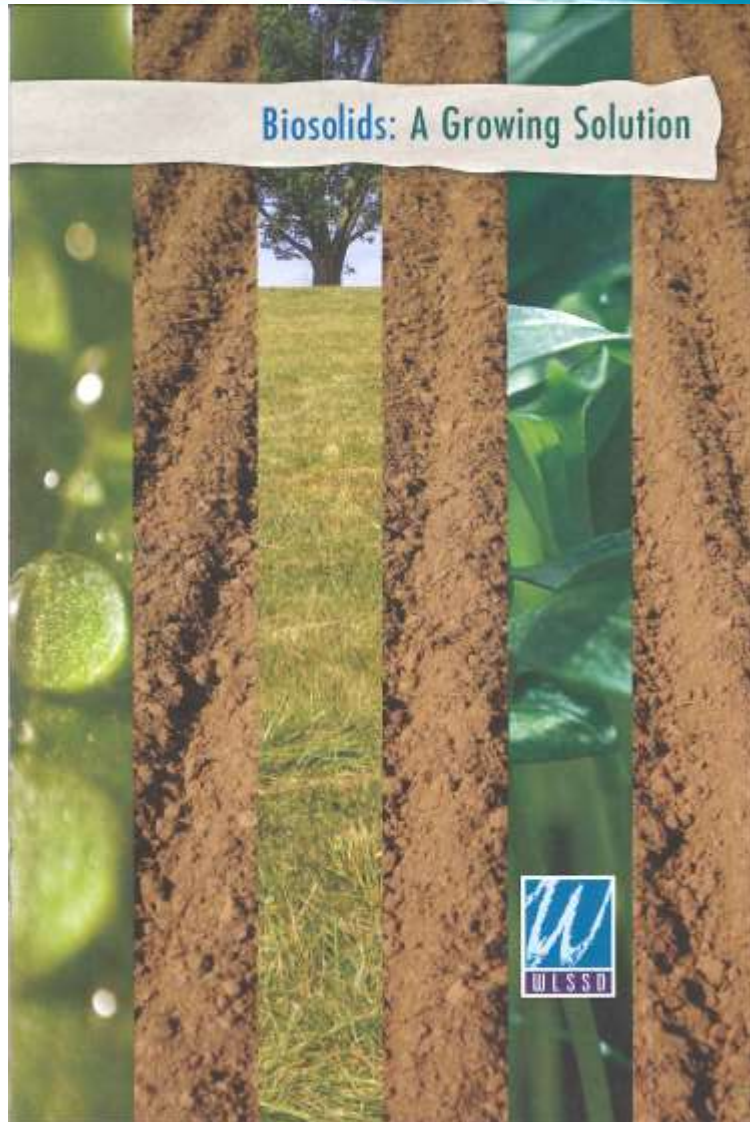
FIELD GREEN
The wiser fertilizer™

*The information in this brochure is based on studies conducted by the Minnesota Experiment Station from 2008 to 2011 for the Western Lake Superior Sanitary District.

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Public communication uses simple language and good design



Using biosolids to enrich soil

The use of biosolids as a fertilizer has been common practice in Minnesota and throughout the United States for decades. Spreading biosolids onto the soil surface or incorporating or injecting them into the soil as a fertilizer is called land application.

Biosolids are an effective fertilizer because they contain nutrients such as nitrogen, phosphorus, potassium, boron, sulfur and zinc. These nutrients are beneficial to plant growth and can dramatically improve crop yields. The organic matter in biosolids can also improve soil structure and moisture retention.



Field Green® biosolids have the appearance and consistency of moist soil.

Increased yields from biosolids are apparent in this cornfield. Field Green® biosolids were applied in the back row, where the crop is much taller and denser than in the foreground area. No biosolids were applied in the foreground area.



Quality of product sets stage for Class A transition

WLSSD biosolids metals as percentage of strictest U.S. EPA standards for each application



A man wearing a cap and sunglasses stands in a field of yellow flowers, holding a long green plant stem. The background shows trees and a barn.

Questions?

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