

MEMORANDUM

To: MCWD Board of Managers Operations and Programs Committee

From: Kelly Dooley and Yvette Christianson

Date: February 5, 2018

Re: E-grade Development Summary and Implementation Plan

Purpose of Presentation:

To update the Operations and Program Committee on the development of the Ecosystem Evaluation Assessment (E-Grade) tool. The summary document provides an overview of E-Grade's background, purpose, and development of E-Grade and how it has evolved over the past 4 years to align with MCWD strategic plan. Staff will be presenting an example of the final E-Grade for Six Mile Creek-Halsted Bay subwatershed. A handout of all three subwatersheds' E-Grade will be provided at the meeting.

Purpose of the Discussion:

Staff will also be discussing the education and outreach goals/outcomes, key messages and strategies, and how we plan to roll out the final version to our target audiences. The communication plan is provided in the packet.



E-grade Development Summary 2018

Background

Since the 1990s, Minnehaha Creek Watershed District (MCWD) has been using lake grades, created by the Metropolitan Council, to communicate about the health of lakes within the watershed. The lake grading system, is based on three factors – phosphorus, chlorophyll and clarity. The lake grades only provide a partial snapshot of the watershed’s ecological health and do not consider the various services of a waterbody, such as flood control and habitat, which are indicators of a healthy ecosystem. Also, the current system only assesses lakes, and does not differentiate between deep and shallow lakes which have very different characteristics and functions. The District’s 2007 Watershed Management Plan called for the development of a water quality index that encompasses the District’s broader definition of water quality. In 2014, the MCWD Board of Managers approved the development of the Ecosystem Evaluation (E-grade) tool as a replacement to the lake grade system.

Purpose of the E-grade Tool

In an effort to promote greater understanding of the overall health of the Minnehaha Creek watershed, the E-grade tool will replace the lake grade system and broadly characterize the health of the waterbodies and uplands throughout the eleven subwatersheds within the watershed.

Development of the E-grade Tool

In 2014, MCWD contracted with Wenck Associates to develop the E-grade tool in collaboration with MCWD staff. The initial goals that were established for the tool were to have a scientific foundation, maximize the use of existing data, assess all 11 subwatersheds by 2024, and phase out the use of the lake grade system.

Thorough research was conducted on existing watershed evaluation systems to provide a baseline on how to develop the E-grade tool. Humber River Watershed Report Card (Toronto, CA), Muskoka Watershed Report Card (Muskoka, CA), Watershed Health Assessment Framework (MnDNR), and the United Nations (UN) Environment Programme Integrated

Ecosystem Management Approach were some of the systems in use throughout the world. MCWD and Wenck decided to base the tool upon the UN Environment Programme integrated ecosystem management approach as it was the best fit for MCWD (*UN Environment* - web.unep.org/ecosystems/who-we-are/about-ecosystems).

The UN's approach focused on ecosystem services, functions that natural systems perform to the benefit of the environment. Ecosystem services are key to sustainability, and how well services function affects the quality of ecosystems. Given this understanding, the UN Environment Programme developed an integrated approach to ecosystem management that "focuses on sustaining ecosystems to meet both ecological and human needs." The UN's approach identified about three dozen ecosystem services to assess and manage.

The E-grade development team utilized the expertise and scientific knowledge of a technical advisory committee (TAC) throughout the development of the E-grade tool. Members of the TAC included representatives from regional, state, and local agencies, as well as academics from the University of Minnesota. The TAC provided guidance and feedback on which ecosystem services to select as well as the metrics to be used in assessing ecosystem performance. The TAC also allowed for partnership opportunities, sharing biological data and their scheduled data collection to prevent overlapping of monitoring efforts. The TAC fulfilled two goals – to maximize the use of existing data and to provide professional rigor to a scientific foundation of the E-grade tool.

From the three dozen ecosystem services used by the UN, the E-grade development team initially decided upon six ecosystem services as the foundation of the E-grade tool:

- flood control
- nutrient cycling
- biodiversity
- habitat diversity
- recreation
- groundwater supply

These ecosystem services, which fit under the management scope for MCWD, would be assessed across seven natural resource types:

- deep and shallow lakes
- streams
- wetlands
- uplands
- hydrology
- groundwater

Building the E-grade Framework

The E-grade development team wanted to build and test the E-grade tool using subwatersheds that had a variety of natural landscapes conditions. MCWD staff selected three test subwatersheds: Minnehaha Creek, Schutz Lake, and Six Mile Creek-Halsted Bay. Minnehaha Creek Subwatershed is urban and stream dominated, while Six Mile Creek-Halsted Bay is a mix of rural and new development, and is dominated by many lakes and wetlands. Schutz Lake is a one lake system with a mix of rural and urban development.

The ecosystem services were developed, and updates were presented to the Board of Managers for each of the following natural landscapes types:

- Lakes - May 2016
- Streams - July 2016
- Wetlands - Dec 2016
- Hydrology (incorporated into habitat diversity and flood control ecosystem services) - July 2017
- Uplands – to be covered at the Feb 8, 2018 Operations and Programs Committee meeting

Shift in Strategic Priorities

Throughout the early stages of development, the E-grade tool was touted as a method for the Research and Monitoring Department to identify stressors and opportunities within a subwatershed, from which the Planning Department would develop and implement policies and actions. There were many internal discussions about the extent to which the tool would be able to inform implementation.

Through the strategic planning process, the purpose of the E-grade tool was more clearly defined – to broadly characterize ecological health. While the tool will provide baseline data for new ecological parameters and identify high level issues, it will not identify issues/stressors and opportunities at a project-specific scale.

In February 2017, the Board of Managers approved the new strategic direction of the Research and Monitoring Department. The new direction outlined four purposes (in order of priority):

- Diagnose issues and stressors to guide management strategies
- Track the efficacy of implementation efforts across the watershed
- Broadly characterize ecological health
- Identify trends in water quality, water quantity, and ecological integrity

There are aspects of the E-grade tool that can be used to assist the Research and Monitoring Department in identifying issues, and to assist in evaluating project efficacy, but further

diagnostic assessment is needed to determine why there are issues and where they are occurring on the landscape. However, using aspects of the E-grade tool to address these tasks is not the main purpose of the E-grade tool.

Changes to the E-grade Framework

In response to the shift in the Research and Monitoring Department purpose and guidance from the TAC, the E-grade framework underwent a few changes from the initial design.

Natural landscape types was reduced from seven to five. Hydrology, not being a strong natural landscape type, was merged into two of the ecosystem services – habitat diversity and flood control. Groundwater was dropped completely from the natural landscape type and the ecosystem service lists, as the District’s water infiltration does not interact with the deep groundwater aquifers.

Originally, the schedule of E-grade assessments across the eleven subwatersheds would be a three year rotation of subwatershed groupings, until all eleven subwatersheds were assessed by 2024. Both subwatershed reports and watershed-wide E-grade reports were to be published. In order to meet the needs of the strategic priorities to focus on diagnosing issues throughout the watershed, the schedule shifted to publishing preliminary reports on the remaining subwatersheds based on existing data. These reports will be updated based on District priorities and as capacity allows. There are currently no plans to publish a watershed-wide report. See the E-grade Education and Outreach Plan for the revised E-grade schedule and when the lake grades will be phased out.

E-grade Ecosystem Services and Metrics

Natural Resource Type	Scale	Ecosystem Services												
		Biodiversity		Habitat Diversity				Nutrient Cycling		Recreation	Flood Control			
Deep & Shallow Lakes	Individual Waterbody	Fish IBI*	Floristic Quality Assessment (FQI)	Modified FQI		Score the Shore			TP	ChIA	Secchi Depth	---		
	Mgmt Unit	---		---				---		---	---	Storage Capacity		
Streams	Reach	Fish IBI*	Macro-invertebrate IBI	MSHA	Barriers	DO	TSS	Flash-ness Index	Baseflow Support	TP	TKN	NO3	TSS	---
	Mgmt Unit	---		---				---		---	---	---	Floodplain Encroachment	
Wetlands	Individual Waterbody	Rapid Floristic Quality Assessment (RFQA)		Weighted RFQA			Minnehaha Creek Routine Asst. Method Survey (McRAM)		Soil Phosphorus		---	---		
	Mgmt Unit	---		---				---		---	---	Storage Capacity		
Uplands	Mgmt Unit	---		% Intact Uplands	WHAF Riparian Connectivity				Averaged TP Runoff Conc.	Parks, Recreation, & Open Space Area Per 1000 Residents		% Imperviousness Cover		

*Only if applicable

Mgmt Unit = Management Unit; Fish IBI = Fish Index of Biological Integrity; MSHA = Minnesota Stream Health Assessment; WHAF = MnDNR's Watershed Health Assessment Framework; TP = Total Phosphorus; ChIA = Chlorophyll-a; TKN = Total Kjeldahl Nitrogen; NO3 = Nitrate; TSS = Total Suspended Solids

E-grade Technical Thresholds

The MCWD will use the following graded scale to assess the natural resources in each of its 11 subwatersheds:

Technical Threshold Descriptions	
E-grade Classification	Narrative description
Exceptional	Community structure and species composition or ecosystem processes are <u>near reference conditions</u> . The most relatively pristine communities.
Good	Community structure and species composition or ecosystem processes are <u>beginning to show signs of disturbance</u> , but supports the ecosystem service.
Poor	Community structure and species composition or ecosystem processes <u>show obvious signs of disturbance</u> .
Degraded	Community structure and species composition or ecosystem processes are <u>showing high levels of disturbance</u> .

Ecosystem is biological community of interacting organisms and their non-living environment. An ecosystem can vary greatly in size; a watershed is an ecosystem, as is a lake.

Implementation of E-grade: E-Grade Education & Outreach Plan 2018

E-grade Tool Framework

In an effort to promote greater understanding of the overall health of the Minnehaha Creek watershed, the Minnehaha Creek Watershed District (MCWD or District) is embarking on a new system of evaluating the health of its natural resources. The new tool, called E-grade, takes a comprehensive look at the health of an entire ecosystem (*see definition below*).

E-grade replaces the current lake grading system which has provided only a partial snapshot of the watershed's ecological health. The current system is only based on three factors – phosphorus, chlorophyll and clarity – and does not consider the various services of a waterbody, such as flood control and habitat, which are indicators of a healthy ecosystem. Also, the current system only assesses lakes and does not differentiate between deep and shallow lakes which have very different characteristics and functions.

The E-grade tool will evaluate the performance of a wider range of natural resource types on a variety of services to create a comprehensive assessment of ecological health in the watershed. The data that is assembled will allow the District to evaluate and communicate ecosystem health at a broad level, and support project development and effectiveness monitoring. It will also help the public understand the various factors that impact the health of the natural resources.

Under this new tool, natural resources in the District will be evaluated for their performance of the following five ecosystem services. Ecosystem services are the benefits people obtain from ecosystems

- **Flood control** - the protection of life and property and limitation of erosion in conveyances and sedimentation into receiving waters
- **Nutrient cycling** - the efficient recycling of nutrients to support primary production and prevent eutrophication and nutrient deficiency

- **Biodiversity** - the variety of life within an ecosystem. The more diverse an ecosystem is, the more stable it is, the more productive it tends to be, and the better it is able to withstand environmental stress.
- **Habitat diversity** - the range of habitats within an ecosystem. If there is a variety of habitats present, than the ecosystem is able to support more robust and biodiverse assemblage of organisms, which in turn, provides greater recreational opportunities (hunting and fishing).
- **Recreation** - the intrinsic and extrinsic rewards of community, fun, exercise, relaxation, tourism, inspiration, and meaning

The MCWD will assess five landscape types:

- Deep lakes
- Shallow lakes
- Streams
- Wetlands
- Uplands

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Timeline

In 2014, the District began collecting the additional data required for the new E-grade tool in three “test” subwatersheds: Minnehaha Creek, Schutz Lake and Six Mile Creek-Halsted Bay. Detailed reports on the health of these subwatersheds based on this data will be released in 2018 along with peer-reviewed papers to be published in scientific journals. For the remaining subwatersheds, reports will be developed based on existing data. These reports will be updated as the District collects additional data (beginning with Painter Creek in 2021). The MCWD will conduct future updates to these subwatershed reports based on District priorities and as capacity allows.

2018 Subwatersheds Group 1 Reports	2019 Subwatersheds Group 2 Reports*
Minnehaha Creek Schutz Lake Six Mile Creek-Halsted Bay	Christmas Lake Dutch Lake Gleason Lake Lake Minnetonka Lake Virginia Langdon Lake Long Lake Creek Painter Creek

* Based on existing data and may not include all E-Grade parameters

Education & Outreach Goals/Outcomes

1. Increase awareness of the new grading system, its performance measures, and how it will improve the District’s ability to identify issues and target its resources
2. Increase understanding and support among District stakeholders for the E-grade tool, the opportunities it defines and the resulting projects it supports
3. Increase knowledge of the function and values of the natural resources and how the public can help improve the health of the natural resources in an ecosystem
4. Increased credibility of the District and its scientific methods among its target audiences and provide a model for other organizations

Target Audiences

1. Non-technical
 - a. Internal
 - CAC
 - Board of Managers
 - b. External
 - LGU elected officials
 - Lake, stream, neighborhood associations
 - Property owners adjacent to local waters
 - Business community (e.g. marinas, realtors)
 - General public/media
2. Technical
 - a. MCWD staff
 - b. Government agency staff
 - State (MPCA, BWSR, DNR)
 - Regional (TRPD, MPRB, LMCD)
 - City and County
 - c. Professional/Academic
 - Scientific and academic community
 - Local watershed districts

Key Messages

1. The E-grade Program results in a holistic assessment of the health of an entire ecosystem.
 - a. Current lake grades only evaluate water clarity and give a narrow view of a waterbody's health
 - b. New tool considers five natural resource services – flood control, nutrient cycling, biodiversity, habitat diversity, and recreation– resulting in a more comprehensive evaluation
2. The E-grade Tool will provide additional data to help the District identify issues, guide management strategies and target its resources.
3. The E-Grade Tool will educate the public on the functions, values and health of the District's water resources and provide information on how the public can protect and improve those resources.
4. Subwatersheds will be graded periodically according to District priorities and to evaluate changes over time.
5. The E-grade tool ensures a more robust, holistic and scientifically sound data set that is recognized by the scientific community and is a model for other organizations

- a. The tool was developed in conjunction with a variety of agencies and technical experts
- b. District seeks publication of peer-reviewed papers in scientific journals
- c. Other organizations replicate E-grade to assess the natural resources in their jurisdictions

Strategies

1. Development of the E-grade Tool: Soft rollout of E-Grade
 - a. Gradually introduce E-grade tool to key audiences to increase awareness and understanding of the E-grade's purpose, manage expectations, and answer questions
 - b. Gradually phase out the distribution of lake grades to reduce the expectation of an annual report card based on old parameters
2. Introduction of report cards: Targeted launch of first three E-grade report cards to target audiences in 2018. Repeat strategy with remaining subwatersheds in 2019.
 - a. Release information to target audiences in each subwatershed through direct mail and meetings
 - b. Release information to other audiences through news releases, social media, and other distribution channels
3. Post implementation outreach: Ongoing District-wide and targeted education and outreach efforts
 - a. Ensure E-grade web page and interactive map have latest information
 - b. Provide subwatershed reports, presentations and other information to target audiences as needed
 - c. Tell stories of how new data is being used

Tactics & Outreach Timeline

- 2015
Soft Rollout of E-grade
 - Late winter 2015 – Introduction
 - One-page fact sheet distributed at comp plan kickoff meeting
 - Informational web page
 - Spring/Summer 2015 – Continued general messaging to stakeholders
 - Incorporate E-grade messaging into comp plan communications with advisory committees, etc.
 - Release lake grades on Splash and website only (discontinue news release) with preview of E-grade
 - Preview of E-grade to the media (year in review article in Lakeshore Weekly, etc)

- Short article in 2015 Mid-Year Report mailed to stakeholders and posted on website
 - September: Memorandum to the Board of Managers E-grade Program Development Update
 - November: Presentation to the Board of Managers on Envisioning of E-grade Tool
- 2016
 - Soft roll-out of E-grade
 - March: Presentation to the CAC Meeting about E-grade
 - May: Presentation to the Board of Managers on E-grade: Deep and Shallow Lakes
 - One-page fact sheet distributed at AIS Spotlight event
 - Preview of E-grade in Lake Grades release on Splash and website
 - Half-page article in 2016 Mid-Year Report mailed to stakeholders and posted on website
 - July: Presentation to Board of Managers on E-grade: Streams
 - November:
 - Presentation by MCWD Staff on the Framework of Valuing Ecosystem Services at the North American Lake Management Society Symposium in Banff, Canada
 - Presentation by Wenck on the E-grade for Lakes in the Minnehaha Creek Watershed District at the North American Lake Management Society Symposium in Banff, Canada
 - December: Presentation to Board of Managers on E-grade: Wetlands
- 2017
 - Soft roll-out of E-grade
 - Full-page article in 2016 Year in Review mailed to stakeholders and posted on website
 - Preview of E-grade in Lake Grades release on Splash/Website
 - Preview of E-grade in 50th Anniversary publication and video series
 - Preview of E-grade in newspaper column – featured in Victoria Gazette, Lakeshore Weekly News and Sun Sailor
 - July: Presentation to Board of Managers on E-grade: Streams and Hydrology
 - November: Presentation to the CAC Meeting about E-grade

- 2018

- Introduction of first report cards:

- Multi-phased release of the new report card for Minnehaha Creek, Schutz Lake and Six Mile Creek-Halsted Bay Subwatersheds.

- Phase One: Release to internal audiences
 - February 8: OPC review of draft Communications Plan
 - Early March: Present draft report card to staff for review
 - April 4: Staff Review of updated draft at brown bag
 - April 11: CAC Review of draft report card & Communications Plan
 - April 12: OPC Review of draft report card
 - April 26: Presentation of final report card to Board of Managers
 - Phase Two: Release to technical audiences
 - Early April: Send letter to city and other government agency staff inviting them to meeting explaining the new report cards
 - April 25: Host meeting for technical audiences, inviting staff from all cities and other government agencies across the watershed. Show a digital preview of the draft report card during the presentation.
 - Phase Three: Release to public
 - Early May: Send letter/postcard to subwatershed target audiences (policymakers, lake associations, business owners, residents) inviting them to their subwatershed meeting
 - Week of May 14: Host one meeting for the Minnehaha Creek Subwatershed and a second meeting for the Six Mile Creek-Halsted Bay and Schutz Lake Subwatersheds, ensuring both meetings in the same week – distribute hard copies of the final report card at the meetings
 - After each meeting, post report card for the respective subwatershed on website, so they can refer to website after meeting.
 - After second subwatershed meeting, issue news release to news media and distribute via Splash, social media and website; include lake grades for remaining lakes not covered by 2018 E-grade reports
 - Submit articles and columns to local newspapers, magazines and city, lake, stream and neighborhood association newsletters
 - Send the link to the E-grade webpage via email to government agency staff and professional/academic staff
 - As needed/requested, make presentations to city councils, civic groups, lake/stream/neighborhood associations, conferences, etc.

- 2019 and beyond

- Introduction of remaining report cards

- Follow same protocol as above

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