

COON CREEK WATERSHED DISTRICT

2014 Annual Report and Management Assessment

An Assessment of Progress in Implementing the
Comprehensive Watershed Plan and the Needs
and Adjustments to Ensure Success

Tim Kelly

Version 3.2

Our Mission is to manage ground water and the surface water drainage system to prevent property damage, maintain hydrologic balance and to protect water quality for the safety and enjoyment of citizens and the preservation and enhancement of wildlife habitat.

Coon Creek Watershed District
2014 Annual Report and
Management Assessment

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Reporting Requirements

The Coon Creek Watershed District (District) is required to annually report on a variety of activities. These requirements and the state and federal laws that mandate the reporting are:

1. The Minnesota Watershed Act (M.S. 103D.351)
2. The Metropolitan Water Management Act (M.S. 103B.231)
3. The Minnesota Wetland Conservation Act (M.S. 103A)
4. The National Pollution Discharge Elimination System (NPDES) Program.

NOTE: A review and audit of the District's finances is provided in the District's Annual Financial Report and Audit of 2014 performed by the Minnesota State Auditor.

REPORT and REVIEW OBJECTIVES

Additionally, the objectives of this report and management review are to:

1. Monitor the implementation of the 2013 – 2023 Comprehensive Watershed Management Plan as a whole and of its component projects in relation to changes in the context, operating environment and circumstances of their implementation.
2. Provide a method of evaluating District management and operations.
3. Validate the goals, priorities and program focus areas in the Comprehensive Watershed Management Plan.
4. Evaluate the progress towards long term results and identify barriers to achieving those results.
5. Identify and adopt new ways to improve capabilities for accomplishing results and remove barriers.
6. Adjust management direction to reasonably assure achievement of the District's mission and strategic goals.
7. Implement a rapid problem identification system as well as a system for internal communications to various stakeholders.
8. Facilitate evaluation procedures during and other activities through the definition of specific indicators.

COON CREEK WATERSHED DISTRICT AT A GLANCE

District Mission

To manage ground water and the surface water drainage system to prevent property damage, maintain hydrologic balance and to protect water quality for the safety and enjoyment of citizens and the preservation and enhancement of wildlife habitat.

To carry out its mission, the District:

1. Advocates a conservation ethic in promoting the health, productivity, diversity, and beauty of water and related land resources.
2. Listens to citizens and responds to their diverse needs in making decisions.
3. Protects, restores, and manages the watershed's water and related resources for sustainable multiple-use management of water resources.
4. Provides educational, technical and financial assistance to Cities, Anoka County and private landowners, encouraging them to practice good stewardship and quality land management in meeting their specific objectives and improve their water resources.
5. Help communities to wisely use the water and related resources to promote economic development and a quality environment.
6. Develops and provides scientific and technical knowledge and educational programs aimed at improving the capability to protect, restore, manage, and use water and related resources.

District Roles

The Coon Creek Watershed District serves the following specific and required statutory roles:

- (1) **Drainage Authority** over all public drainage ditches within the watershed under M.S. 103E
- (2) **Comprehensive Surface Water Management Organization (WMO)** for Coon Creek Watershed and select adjacent subwatersheds under the Metropolitan Water Management and Watershed Acts (M.S. 103B & MS 103D)
- (3) **Local Governmental Unit (LGU)** administering the Wetland Conservation Act (WCA) except for the City of Spring Lake Park where the District provides assistance and oversight when and where needed.
- (4) **Municipal Separate Storm Sewer System (MS4)** permittee to the Minnesota Pollution Control Agency under the Federal Clean Water Act NPDES program.

Goals

The District has adopted five mission goals and eight issue goals. Pursuit of these goals is articulated in the District Comprehensive Watershed Management Plan.

Mission Goals

1. To prevent property damage from flooding, erosion or degraded water quality
2. To ensure balance between inflow, outflow and storage of water
3. To protect and enhance water quality
4. To provide for multiple beneficial uses including the safety and enjoyment by the watershed's residents
5. To preserve and enhance wildlife

Issue Goals

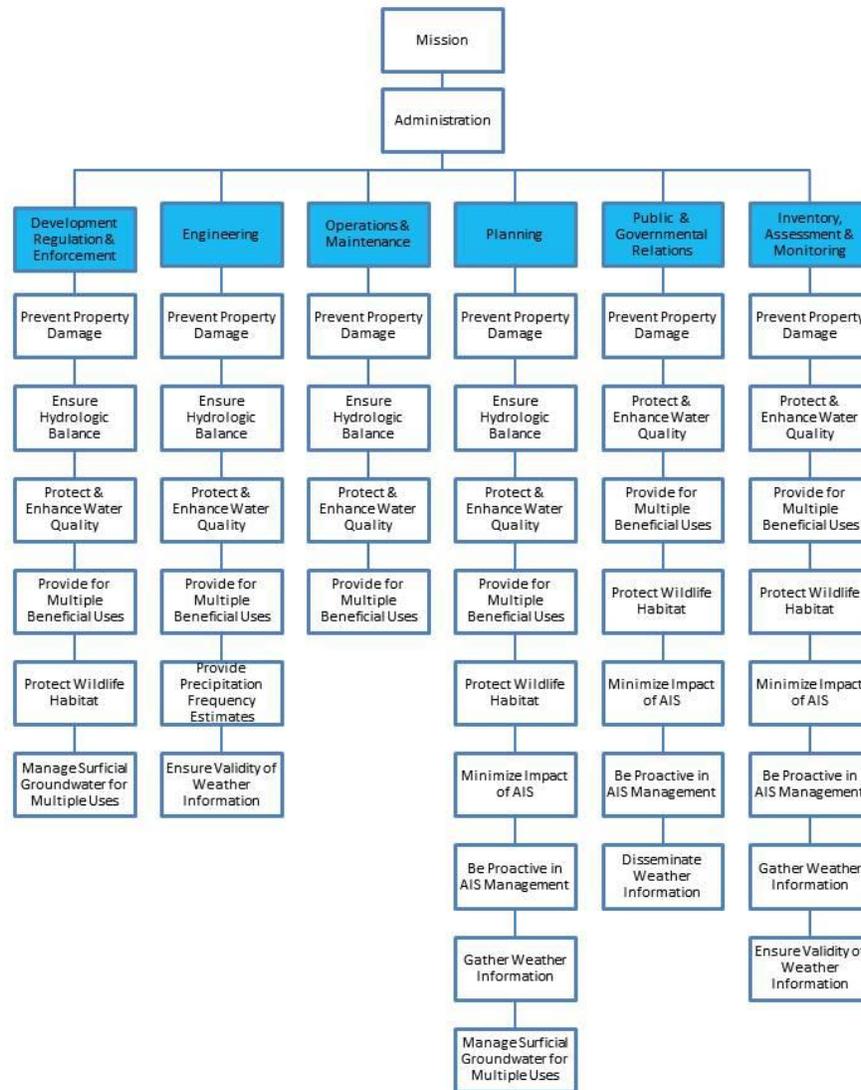
6. To minimize the harmful ecological, economic and human health impacts of aquatic invasive species (AIS).
7. To be proactive in aquatic invasive species management through education and projects that improves lake and stream water quality and/or reduces the risk of entry of invasive species.
8. To control the spread of AIS and minimize their impacts on native habitats and species.
9. To gather and disseminate weather data and climatic information, and provide meteorological expertise in support of Watershed water and related resource management decisions and weather related management activities.
10. To ensure validity, integrity, and utility of weather information provided for Watershed use.
11. To provide precipitation frequency estimates for the Coon Creek Watershed
12. To manage surficial ground water resources for multiple-uses by balancing present and future resource use with domestic water supply needs.
13. To manage groundwater dependent ecosystems under the principles of multiple use and sustainability, while emphasizing protection and improvement of soil, water and vegetation, particularly because of effects upon aquatic and wildlife resources.

Management Priorities

1. Prevent flooding
2. Improve water quality in impaired or impacted waters
3. Maintain and enhance water quality in waters that are not impaired.

How District Programs Accomplish the Mission

The District provides stewardship and management to more than 68,000 acres and 165,000 people through the following seven programs



Administration: Implements the District mission and the approved policies of the Board of Managers, administers the financial affairs of the Coon Creek Watershed District, and ensures the accountability of public funds and serves the District financial needs. Although these business processes are often out of view to the public, without them the District would be unable to deliver the beneficial uses that the citizens of the District expect. The Administration Program consists of six elements: the Board of Managers, Records, Contract and Personnel Administration, Training and Seminars, Financial Management and Risk Management.

Development Regulation: Evaluates, permits and monitors plans and programs affecting the District mission and the water and related resources of the District in an orderly and informed fashion. The Development Regulation and Issue Management Program consist of five activities:

Environmental Review, which includes comments on DNR and Corps of Engineers Permits; Issues and Complaints; Permit Inspection and Enforcement; Permit Review; Permit Issuances.

Engineering: Provides accurate and timely geographic information in graphic or digital form for use by water resource managers, planners, and the general public; To achieve uniform District-wide mapping formats and standards; and ensure that District wide engineering activities are performed at an acceptable level. Program consists of the following activities: flood prevention; public drainage and mapping; hydrologic investigations and modeling; and design and construction

Operations and Maintenance: Planning, design, construction and maintenance of the District's ditch system and water control structures and to preserve the location, character and extent of the District's ditch and conveyance system. Program consists of the following activities: Annual Inspections, Issues & Complaints, Construction, Repair, Routine Maintenance, Demonstration Projects.

Planning: Is the framework used to conform to laws and regulations governing the management of the Coon Creek Watershed. The planning process is focused on the concept of sustainability under planning regulations that require the District to perform assessments that include physical, social and management issues across the watershed's entirety. This program coordinates the planning, prioritizing and financing of the District's programs and activities and consists of the following activities: Annual Assessment, Reporting and Planning, Budgeting and Program Planning, Comprehensive Planning, Policy and Procedures.

Public and Governmental Relations: Ensures that the continued planning and management of the Watershed is responsive to the needs and concerns of an informed public and to coordinate policies and programs of the local, state and federal government agencies to achieve consistency with the plan. A program consisting of three activities has been developed to carry out the District's policies. The components are: Education, Information, and Involvement. In practice, overlap will occur among these three components; all information is educational in nature, and education requires involvement.

Inventory Assessment and Monitoring Supports Watershed Management Plan revisions and amendments; budgets, priorities and implementation schedules. Watershed plan monitoring and evaluation is receiving greater emphasis, including through the Performance Review and Assistance Program (PRAP) process and the new planning rule (MR 8410). The research and data collection program purpose is to gather and analyze data that will result in increased efficiency and effectiveness of District programs. The research, monitoring and data collection program provides integrated resource information used in planning, evaluating and decision making within the District. District planning, regulatory and project decision-making depends upon scientifically credible and accurate resource information. This data allows resource managers to make scientifically based management decisions, essential to effective resource management.

SIGNIFICANT EVENTS in 2014

Noteworthy events/activities that occurred in 2014 and that will influence 2015 operations and the 2016 budget include:

Mission Goals

Preventing property damage from flooding, erosion or degraded water quality

- Reviewed and approved 78 projects involving 490 acres.
- Reviewed and approved 23 rate control ponds and 35 water quality ponds.
- Inspections and condition assessments were completed on all structures and 27 miles (20% of system) of public ditch.
- The non-routine/corrective maintenance program addressed 104 issues at a cost \$18,915.
- Conducted 3 routine repair and maintenance projects involving tree removal at a cost of \$131,600
- Completed the initial construction of a detailed XPSWMM hydrologic model that utilizing LiDAR and Atlas 14 and the District annual inspection program to accurately assess 100 year flood elevations within the watershed.
- Provided technical assistance to the City of Fridley and the Anoka Conservation District in completing the restoration and repair of Oak Glen Creek.
- Initiated 2 e-newsletters; one on establishing a temporary No-Wake zone and one on Blue-green algae alerts.
- Declared an ‘emergency’ on Ditch 44-3, repaired approximately 0.5 mile of public ditch, and lowered the culvert at Lexington Avenue 1.5 feet.
- Removed 11 beaver and dams which were obstructing flows and contributing to local flooding

Ensuring balance between inflow, outflow and storage of water

- Completed the initial construction of a detailed XPSWMM hydrologic model that utilizes LiDAR, Atlas 14
- Reviewed and approved construction of 23 rate control ponds.

Protecting and enhancing water quality

- Reviewed and approved 78 projects involving 490 acres.
- Reviewed and approved construction of 35 water quality ponds.
- Constructed 11 rain gardens in the Sand Creek and Woodcrest Creek subwatersheds for approximately \$102,000
- Constructed three bank stabilization projects in Coon Rapids
- Provided training to approximately 50 public works employees and contractors on efficient winter salt use and turf management BMPs.
- Co-Hosted with the City of Andover training for approximately 50 contractors, public employees and consultants on Erosion Control products at a Minnesota Erosion Control Association Field workshop.
- Initiated 2 e-newsletters; one on CCWD updates for our municipal & agency partners, one specifically for Lake Issues. Newsletters were used to quickly get the word out about

No-Wake zone and Blue-green algae alerts and also to broadcast grant & training opportunities to lake associations and the cities in which they reside.

- The District completed an identification of biotic stressors for Coon Creek, Sand Creek and Springbrook Creek as part of the Watershed Restoration Assessment and Plan (WRAP) funded through a grant from the Minnesota Pollution Control Agency.
- Monitored water quality on two lakes, seven wetlands and 16 stream locations in partnership with the Anoka Conservation District.
- Completed Storm Water Retrofit Assessments for three subwatersheds (Pleasure, Springbrook and Stoneybrook Creeks).

Provide for multiple beneficial uses including the safety and enjoyment of the watershed's residents

- Received a \$5,000 grant for an experimental forest thinning/Buck Thorn removal project in Erlandson Nature Center that focused on vegetative stabilization of creek banks
- Processed 154 applications for development and technical assistance compared to 145 in 2013 and 102 in 2012
- Reviewed and approved 78 projects involving 490 acres.
- Reviewed 18 residential projects involving 136 lots on approximately 150 acres
- Conducted 2 Coon Creek Cleanups with a service group, Blaine-Ham Lake Rotary. Picked up ~3000 lbs of trash.
- Assisted the Lake Associations and the cities of Andover, Coon Rapids and Ham Lake and in clarifying the process and evaluating the establishment of No-Wake zones on Crooked Lake and Ham Lake during the high water in the Spring.
- Initiated 2 e-newsletters; one on CCWD updates for our municipal & agency partners, one specifically for Lake Issues. Newsletters were used to quickly get the word out about No-Wake zone and Blue-green algae alerts and also to broadcast grant & training opportunities to lake associations and the cities in which they reside.

Preserving and enhancing wildlife habitat

- Completed a 5 year update (2014-2018) to the Crooked Lake Comprehensive Management Plan.
- Provided technical assistance on 44 wetland projects
- Reviewed 28 wetland delineations
- Initiated development of a Comprehensive Lake Management Plan for Ham Lake
- The District completed an identification of biotic stressors for Coon Creek, Sand Creek, Pleasure Creek and Springbrook Creek as a first step in addressing fishery concerns.
- Completed the first comprehensive watershed assessment which factored in aquatic habitat, flooding, water quality, wetlands, land use, biota, and soils.
- Required four biological assessments on properties potentially containing endangered or threatened species (1 animal, 8 plants).
- Assisted in redesign of Landscape Plan for the Catcher's Creek development to promote Loggerheaded Shrike (*Lanius ludovicianus*) habitat.
- Assisted in the planning and construction of a Butterfly Garden for the Leonard Skipper (*Hesperia leonardus*) at Camilla Rose in Coon Rapids

Issue Goals

Minimizing the harmful ecological, economic and human health impacts of aquatic invasive species (AIS).

- Provided technical and limited administrative Assistance to the Crooked Lake Area Association in the treatment of Eurasian Water Milfoil and Curly Leaf Pond Weed
- Actively assisted the Ham Lake Lake Association in formulating their first chemical treatment to control Eurasian Water Milfoil and in the preparation of the Comprehensive Management Plan for the lake

Being proactive in aquatic invasive species management through education and projects that improves lake and stream water quality and/or reduces the risk of entry of invasive species.

- Assisted the Lake Associations and the cities of Andover, Coon Rapids and Ham Lake in the establishment of No-Wake zones on Crooked Lake and Ham Lake during the high water in the Spring.
- Assisted the Ham Lake Lake Association in formulating their first treatment for Eurasian Water Milfoil and in the preparation of the Comprehensive Management Plan for the lake
- Used e-newsletters to alert lakeshore owners on Ham Lake about a Blue-green algae bloom occurring in the lake.

Controlling the spread of AIS and minimizing their impacts on native habitats and species.

- Involved in the planning and permitting of the Crooked Lake EWM treatment and in avoiding impact to a colony of White water lily (*Nymphaea odorata*) and Yellow water lily (*Nuphar lutea*).
- Involved in the preliminary assessment of the presence and extent of the newly discovered Eurasian Water Milfoil (*Myriophyllum spicatum*) infestation on Ham Lake.

Gathering and disseminating weather data and climatic information, and providing meteorological expertise in support of watershed water and related resource management decisions and weather related management activities.

- Published monthly and year-to-date “Water Watch”, which tracks precipitation and flood potential information within the watershed.

Ensuring validity, integrity, and utility of weather information provided for Watershed use.

- The spring of 2014 was the wettest spring on record (140 years) leading to increased patrols and inspections, numerous issues relating to flooding and high water and at least one ‘emergency’ declaration.
- The year ended 26% over a normal of 31 inches per year.

Providing precipitation frequency estimates for the Coon Creek Watershed

- Atlas 14, the most current and accurate precipitation frequency estimates, is available through the District web site.

Managing surficial ground water resources for multiple-uses by balancing present and future resource use with domestic water supply needs.

- The Hydrogeologic Atlas portion of the County Geologic Atlas has been delayed at the MDNR for three years now. This delay has hindered the District ability to conduct a management analysis and develop a plan for managing the surficial groundwater that are a key water source for the District's lakes and wetlands.
- Participated in development of the North and East Metro Groundwater Management Plan being spearheaded by the Minnesota Department of Natural Resources

Managing groundwater dependent ecosystems under the principles of multiple use and sustainability, while emphasizing protection and improvement of soil, water and vegetation, particularly because of effects upon aquatic and wildlife resources.

- Reviewed and evaluated three long term dewatering permits and their probable impacts on adjacent water resources. Worked with the DNR and the applicant to modify the proposed volume and or time to minimize or eliminate the impact.

CURRENT MANAGEMENT SITUATION



Demand for Beneficial Uses of Water

All public goods, water among them, are complex and highly integrated resources. It is often impossible to utilize one service or group of services without affecting other goods or services.

For the purposes of assessing the demand for and value of services it is important to note that:

1. All watersheds, regardless of their size and complexity, provide some beneficial uses
2. Different watersheds in different landscape contexts can provide very different mixes of beneficial uses.
3. Beneficial uses, when they are provided in different locations, may not be:
 - a. Equally scarce,
 - b. Suitable or replaceable, and
 - c. May be more or less accessible to people who value them.
4. It is assumed here that the level of demand will respond proportionally to the changes in population.

Relative Scarcity of Water Uses

1. Drinking Water
2. Flood Control
3. Aquatic life and recreation
4. Water Quality
5. Wetlands
6. Aesthetics
7. Mining
8. Groundwater Recharge
9. livestock and wildlife watering
10. Drainage
11. Hunting and Fishing
12. Irrigation

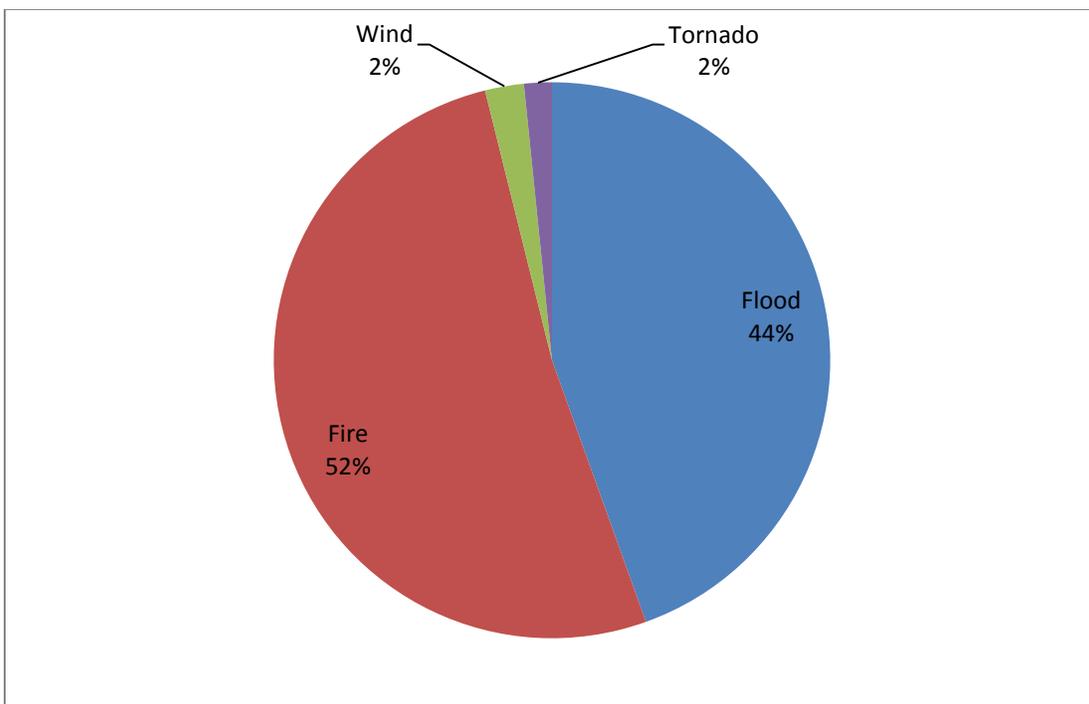
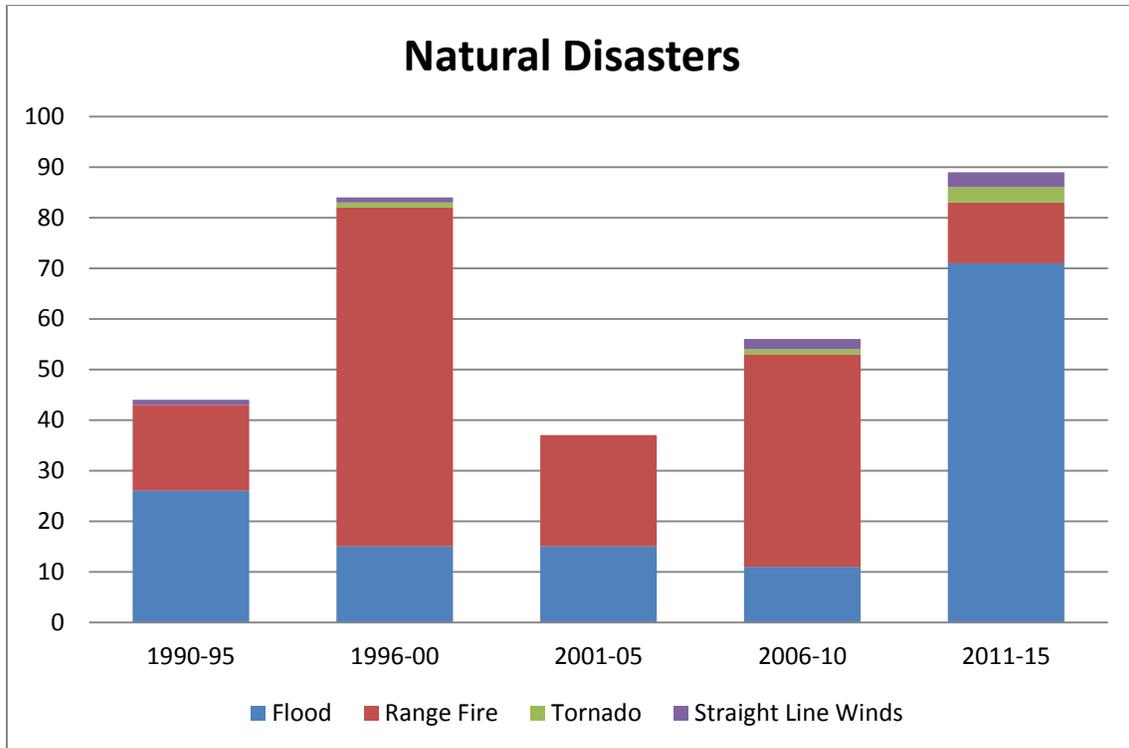
Summary

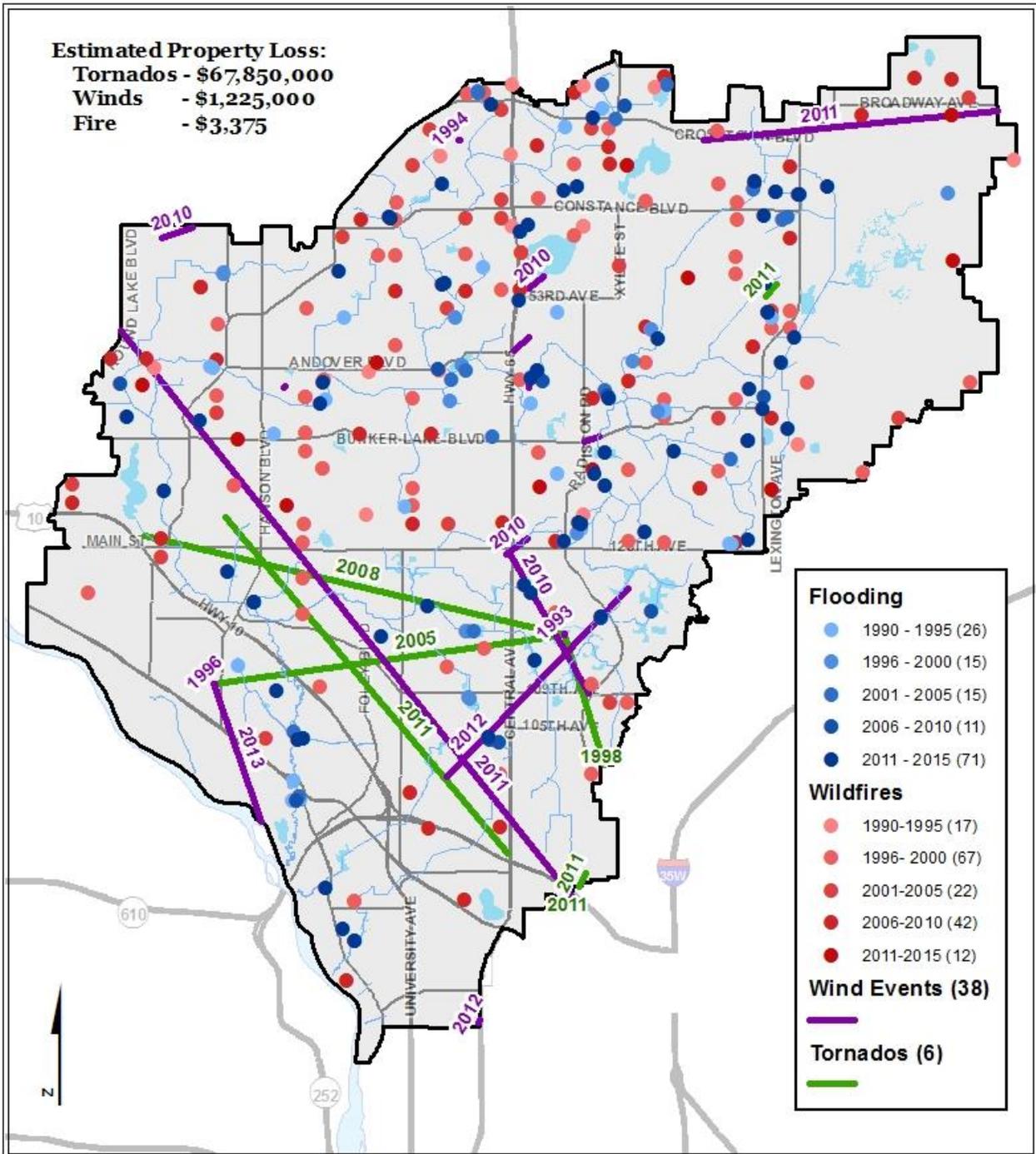
Water resources are important to both society and ecosystems. We depend on a reliable, clean supply of drinking water to sustain our health. We also need water for agriculture, and recreation.

Many of these uses can put pressure on other water resources, stresses that are likely to be exacerbated by climate change. In many areas of the District, changes in precipitation are likely to increase water demand and in turn shrink water supplies. This shifting balance will challenge the District to simultaneously meet the needs of growing communities, sensitive ecosystems, and farmers.

Trends in Natural Disasters

We average about 7 natural disasters per year that directly threaten life and property within the watershed and require the District to respond directly. Fire is included because of its effect on water quality.





Natural Disasters
1990- 2015

Sources:
 MN DNR, NOAA, CCWD

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Coon Creek Watershed District

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District Growth and Economic Trends

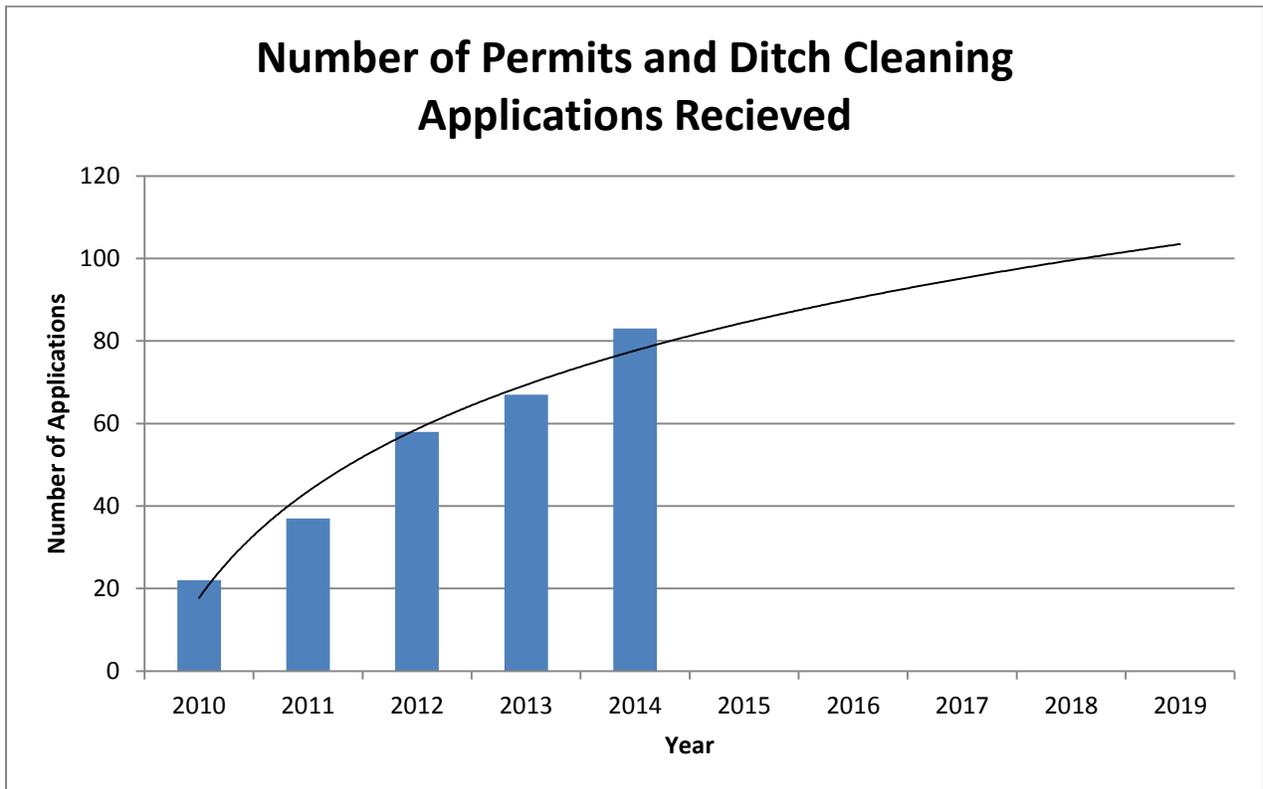
In 2014, 78 projects were reviewed and approved as fully meeting the stormwater, water quality and conservation requirements of the District.

- New commercial development included 30 projects including five middle and elementary school additions. Some examples are Blaine Alzheimer’s Special Care Facility, Clock Tower Commons in Andover, Mercy Hospital/Healthcare Center Parking Addition; Metropolitan Transportation Network Parking Lot Expansion in Fridley; Spring Lake Park Addition Unity Hospital Campus; Vision Woodworking, and National Sports Center Field Expansion.
- New residential development included 29 projects including Carson's Ridge, Enchanted Estates 2nd Addition, Lawrence Estates and the Lakes of Radisson 59th Addition.
- Approximately 20 road and other public works projects were also reviewed and approved including Andover Blvd NW & Crosstown Blvd Turn Lane in Andover, Able Street Reconstruction in Blaine, and Coon Rapids Blvd. at Springbrook Drive in Coon Rapids.
- Another 20 applications were found to not need a permit either because they were exempt under the Wetland Conservation Act, their stormwater was already managed through existing stormwater infrastructure or there were no water or related resource issues.

The growth within the last several years continues to produce a profound increase in demand for District services and has significantly added to the District’s infrastructure and staffing needs. Consequently, this change will result in significant future operation and maintenance costs. The chart below illustrates the significant growth anticipated for the portion of Anoka County within the watershed.

Growth Factors	2014	2015	2016	2017	2018	2019
Total Population	164,983	166,138	167,467	168,807	169,989	171,179
Total Households	62,955	63,711	64,666	65,507	66,228	66,890
Annual						
Permit Applications	154	181	200	212	215	213
Inspections	175	188	190	193	195	197
Single Family Residential Applications	18	15	16	17	16	16
Additional Single Family Lots	136	117	125	127	124	118
Total Public Ditch Miles	134	134	134	134	134	134
Total Water Control Structures	10	10	10	10	10	10
Annual Corrective Maintenance Issues	93	93	92	99	105	96

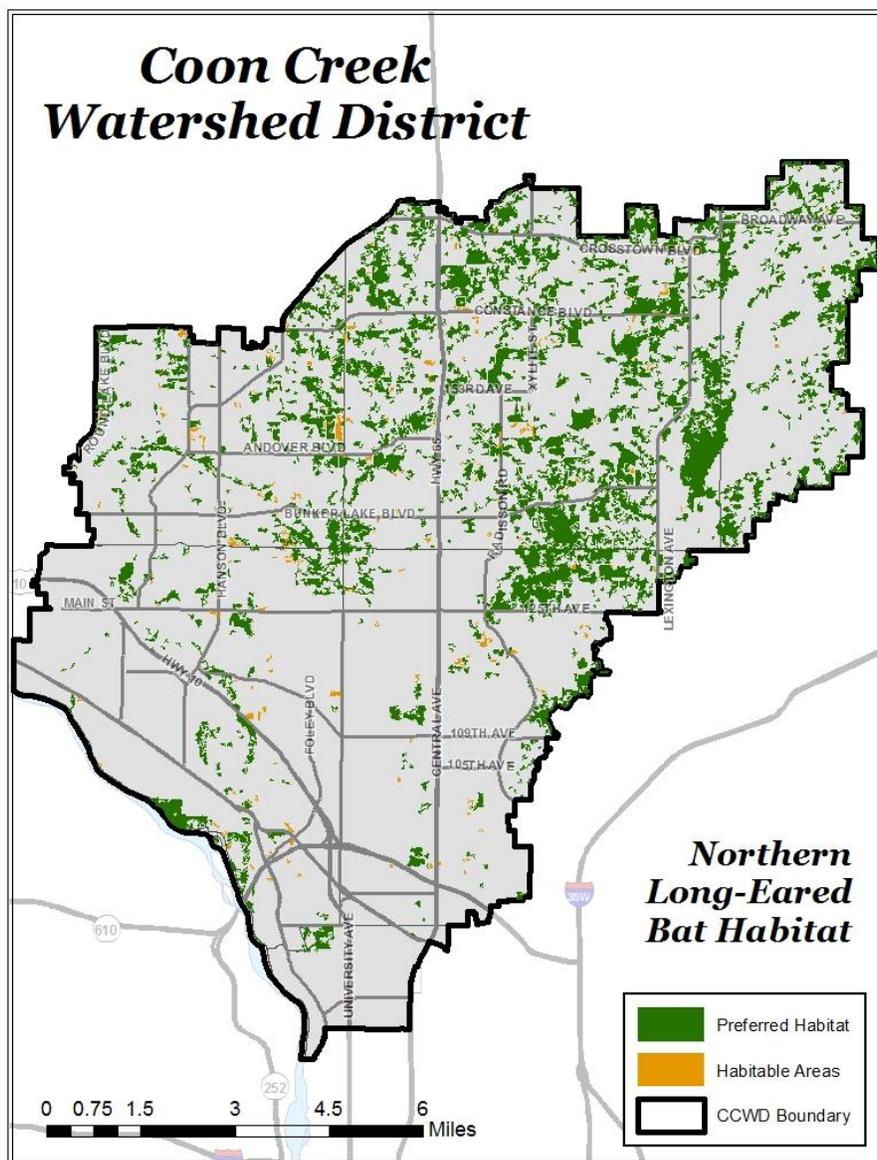
Growth Factors	2014	2015	2016	2017	2018	2019
Annual Aquatic Invasive Species	4	7	9	10	12	14
Annual Enforcement Incidents	58	59	60	60	61	62
Annual Wetland Evaluations & Review	35	41	46	48	49	48
New Stormwater Assets						
Annual Stormwater Ponds	23	23	24	24	24	24
Annual Infiltration Basins	35	35	36	36	37	37



Governmental, Legislative and Agency Trends

Federal Threatened and Endangered Species Listing: In 2014 the Federal Government began the process of adding the Northern Long-eared bat (*Myotis septentrionalis*) to the Federal endangered species list and to designate critical habitat. Currently it is due to be listed in April 2015. The Fish and Wildlife Service has determined that critical habitat for the northern long-eared bat is not determinable at this time. An estimate of potential areas is provided below.

Northern long-eared bats spend winter hibernating in caves and abandoned mines, collectively call hibernacula. During summer, they roost alone or in small colonies underneath bark or in cavities or crevices of both live trees and snags (dead trees). The young of the year are generally flightless through the end of July.



State Threatened and Endangered Species:

As development picks up, proposals are occurring in areas which were once harder to get to or marginal because of access or wetlands. These “undisturbed” areas are often the last bastion of E&T species. Many of the occurrences are either single species or a peppering or mosaic of species across a site. Administration of these species is through the DNR Endangered and Threatened species program. This program is allowed up to a year to issue or deny a permit to “take” the species. The Department is also discussing easing the mitigation (much like sequencing), including a kind of diminimus concept that go directly to taking and mitigation of the species. Understandably this is quite controversial within the E&T community. The fact that it is being discussed marks an important change in urban natural resource management.

NPDES Permit

The current NPDES permit will expire August 1, 2018. MPCA has indicated that many of the provisions that were eventually removed from the current permit as either required or to be phased in will be mandatory in the 2018 permit. These items included, but are limited to: an asset inventory and data base requiring more detail than is used at the local level, much greater and broader restrictions on erosion and sediment control and water quality treatment.

Aquatic Plants & AIS

There is an increasing trend at both the legislature and the state agencies to address aquatic management. Whether it is exploring how to address and pay for combating AIS, or adjusting fee structures to pay for administering rapid response and eradication efforts or long term control and management.

Ditches and Drainage

The state Board of Water and Soil Resources (BWSR) and Department of Agriculture continue to review the drainage law through the drainage workshop and forward consensus issues to the legislature. The BWSR and DNR are in the process of updating the Public Drainage Manual. The Manual covers both technical aspects of drainage and provides guidance for projects conducted by petition under MS 103E.

There continues to be concern among legislators about the effect of agriculture, drainage and water quality. The Governors current proposal to require mandatory buffer strips is part of this trend.

Groundwater

The legislature continues to be very active about in dealing with groundwater concerns. The North and East Ground Water Management Plan is currently under review and will greatly influence state actions and permitting within the eastern portion of the Anoka Sand Plain. While the “popular” perception and concern is about the perceived scarcity of drinking water. The agency concerns appears to be the connectedness of the surficial table and the first bed rock aquifers and the effect on surface waters such as lakes, streams and wetlands. White Bear Lake is the poster child for this effort.

Local Infrastructure Age and the Cost to Retrofit or Replace

Addressing water management comprehensively remains a relative new issue for many cities. The long term and out-of-sight nature of water issues presents both practical and political difficulties in gaining the staff time and money to adequately address both flood control and water quality management. Exacerbating this concern is the overwhelming cost to many local units within the watershed of resizing, retooling, rebuilding and maintaining and repairing existing and needed stormwater infrastructure that addresses the increased water volume indicated by Atlas 14, the increase in water volume, long term, indicated by climate change, and the need to decrease, or halt the discharge of factors influencing water quality.

Data Analytics (Big Data)

Governments are great at collecting information, but they often do a lousy job of using it effectively. Dropping prices for storage and high-speed computing have put sophisticated analytics capabilities within reach of more public agencies, potentially giving policymakers new tools for spotting trends, allocating resources and modeling the impact of decisions.

Civic Innovation & Open Data

While governments are struggling to get a handle on analytics, many have done a good job of opening data for public consumption. Open data initiatives have powered a groundswell of civic innovation. The concept of open data has exploded in recent years thanks to technology, which has made it easier to open up data collected by cities and make it freely accessible to the public.

Online Citizen Engagement

Citizen engagement may not sound like a tech trend, but cities are embracing social media tools and online survey programs to interact with citizens in new and innovative ways.

Geographic Information Systems:

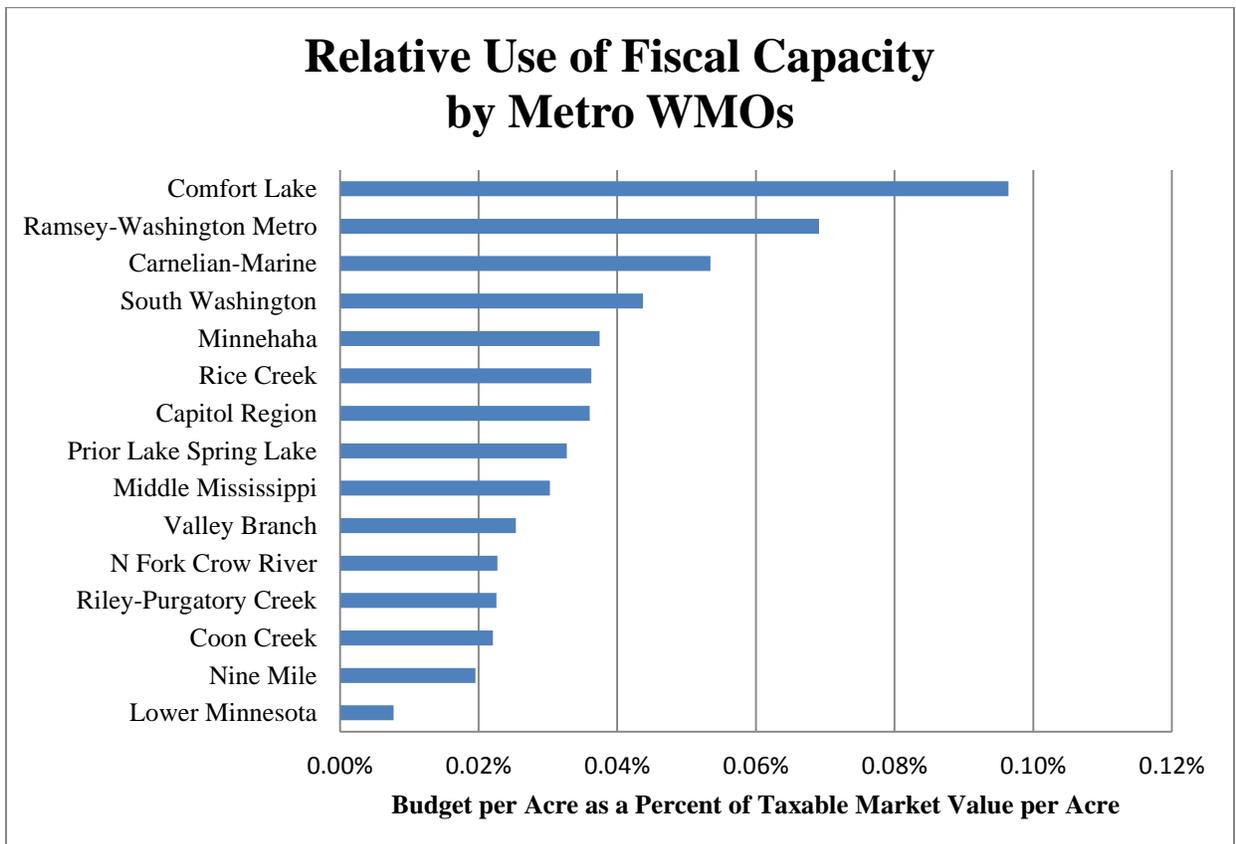
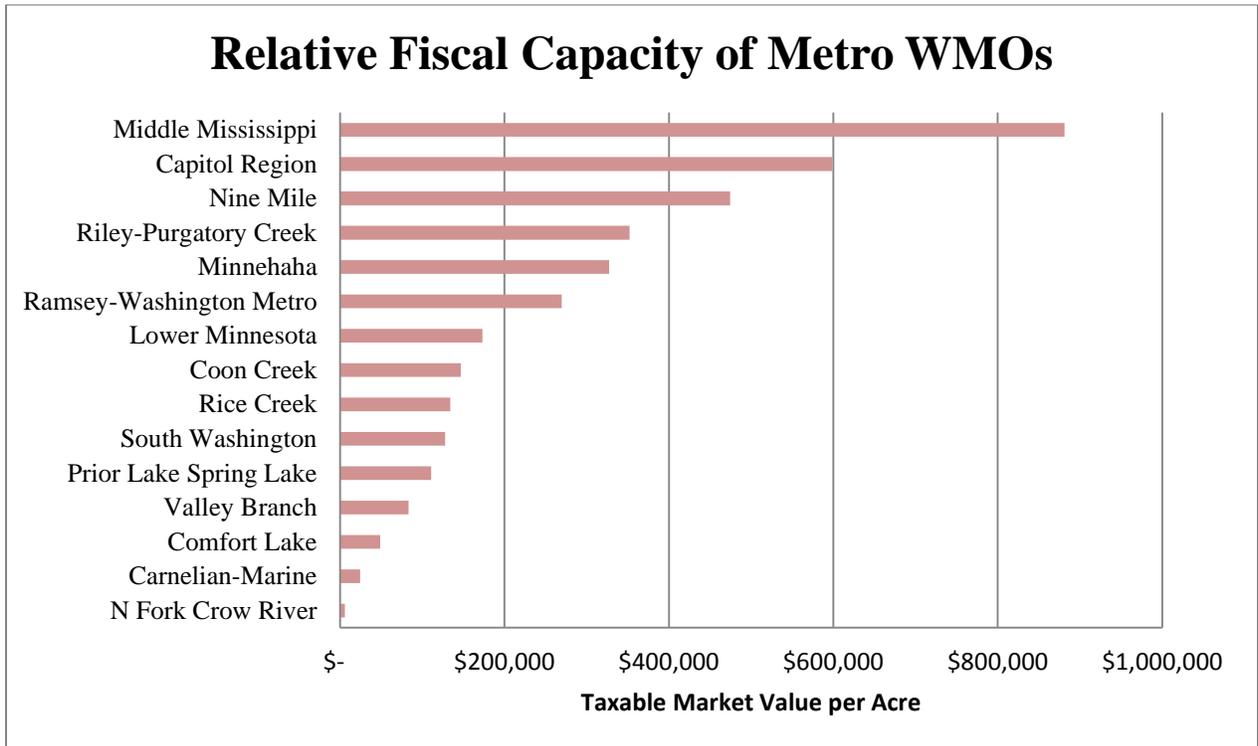
Supporting these new trends is an old technology that has taken on renewed importance in recent years. Geographic information systems (GIS) -- computer systems that can store, manipulate and analyze spatial or geographical information -- have been around since the 1970s, but as these powerful mapping tools have become cheaper and easier to use, they have also become more widespread and beneficial. Cities now use them to analyze financial decisions to increase performance, support public safety, improve public transit, run social service activities and, increasingly, engage citizens about their city's governance.

State Funding

For fiscal years 2004 to 2014

1. Since the early 1990s, the funding mix used to support water resource management has evolved with a greater preference for 'special funds' with narrowly tailored uses.
2. Since the late 1990s, the public, cities and the legislature have approved both bond sales and taxes for natural resource protection programs. These initiatives have included both legislative measures and voter initiatives.
3. Increasing constraints in the use of funds.
4. Increasing perception that most, or all, water and related resource expenditures are unfunded mandates (This conversation has included flood control).

Metro Watershed District and the Relative Importance of Management



Obligations of the District

The District is required to conduct numerous activities either through statute or through commitments made in its Comprehensive Watershed Plan. Below are the projected workloads and estimated costs of fulfilling those commitments.

Obligation	2015	2016	2017	2018	2019
Board Meetings	18	19	18	18	18
Permit Reports to Board	43	46	47	47	48
Permit Applications	154	181	200	212	215
Ditch Inspection Miles	28	27	29	27	27
Amend Comp Plan to Address Water Quality	1	1			
Review Local Water Plans & SWPPPs	7			6	

Local Water Plan	Status
Andover	Under Review
Blaine	Under Review
Columbus	Sep 2010
Coon Rapids	Under Development
Fridley	Under Development
Ham Lake	Draft
Spring Lake Park	Draft

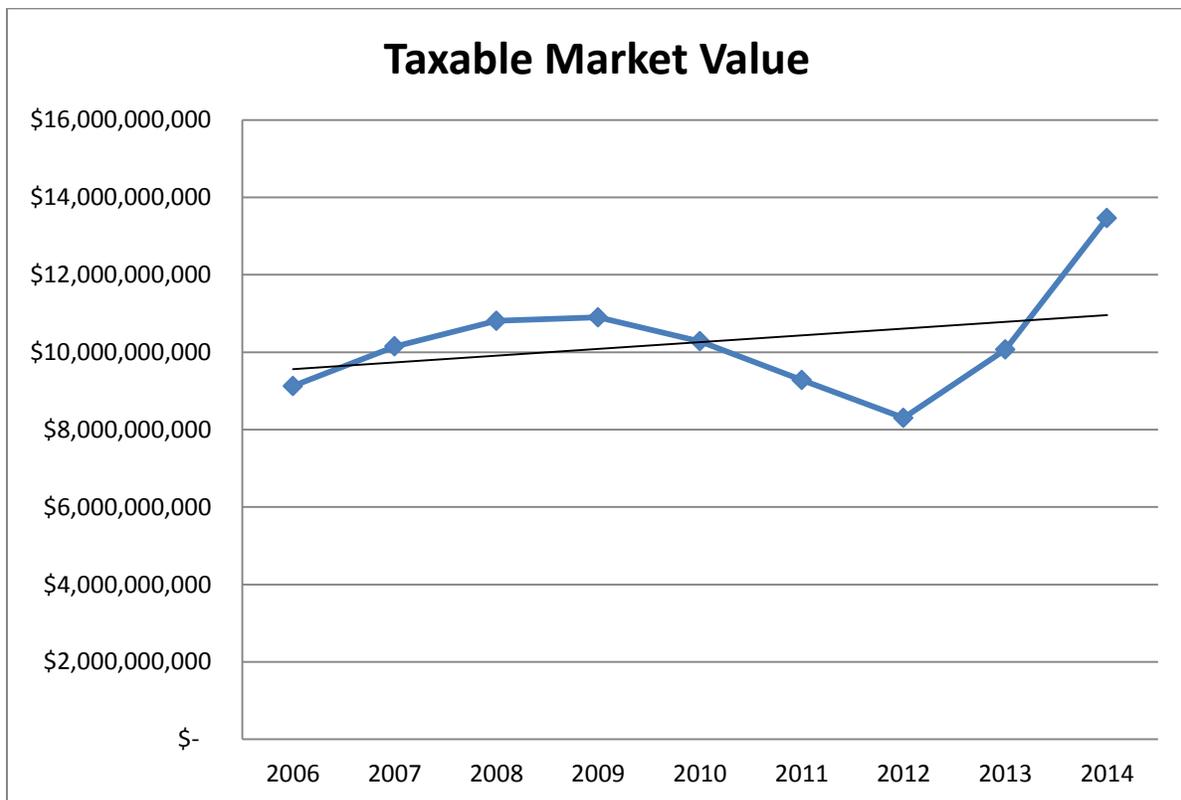
Wetland Bank	Credits Available	COE Approved
Anoka County Hwy Dept	1.33	Y
Tetrault, Philip & Lori	4.81	N
City of Lino Lakes	1.48	N
Brad Moen	27.83	Y
Eric Trelstad	1.80	N
City of Ramsey	0.76	Y
Marcus, Johannes (Hair Bank)	3.92	Almost

41.93

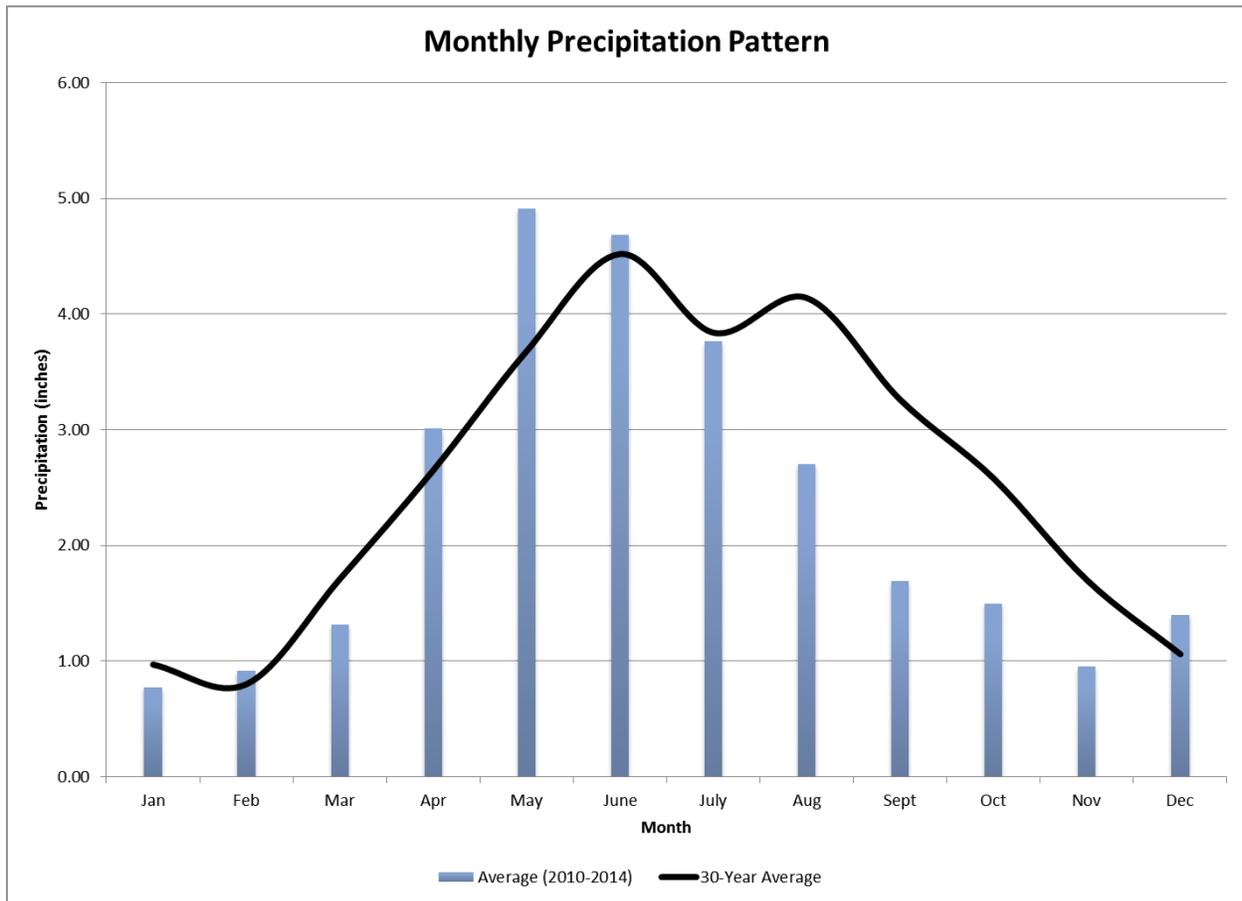
Taxable Market Values

Taxable market value (TMV) refers to the amount of property value that is used in calculating taxes. It may differ from the estimated market value since there are several features of the property tax system that will change the share of value that is taxable when they are applied. In other words, the property tax is not always levied on the estimated market value because various market value components may be removed.

Year	Taxable Market Value	% Change	
2006	\$ 9,123,260,400		
2007	\$ 10,148,197,300	11.2%	
2008	\$ 10,810,623,300	6.5%	
2009	\$ 10,897,910,400	0.8%	
2010	\$ 10,279,550,900	-5.7%	
2011	\$ 9,279,218,000	-9.7%	Merger
2012	\$ 8,301,657,316	-10.5%	Merger Operational
2013	\$ 10,066,503,929	21.3%	First Post-Merger Budget
2014	\$ 13,464,507,926	33.8%	



Weather and Climate



Winter temperatures, precipitation, and snowfall all will be below normal. The coldest periods will be in early to mid-January, late January, and early to mid-February.

The snowiest periods will occur in early to mid-January, and mid- to late February.

April and May will be warmer than normal, with near-normal precipitation.

The hottest periods will occur in mid- to late June, early and mid-July, and early August.

Summer will be drier than normal. September and October will be warmer and rainier than normal.

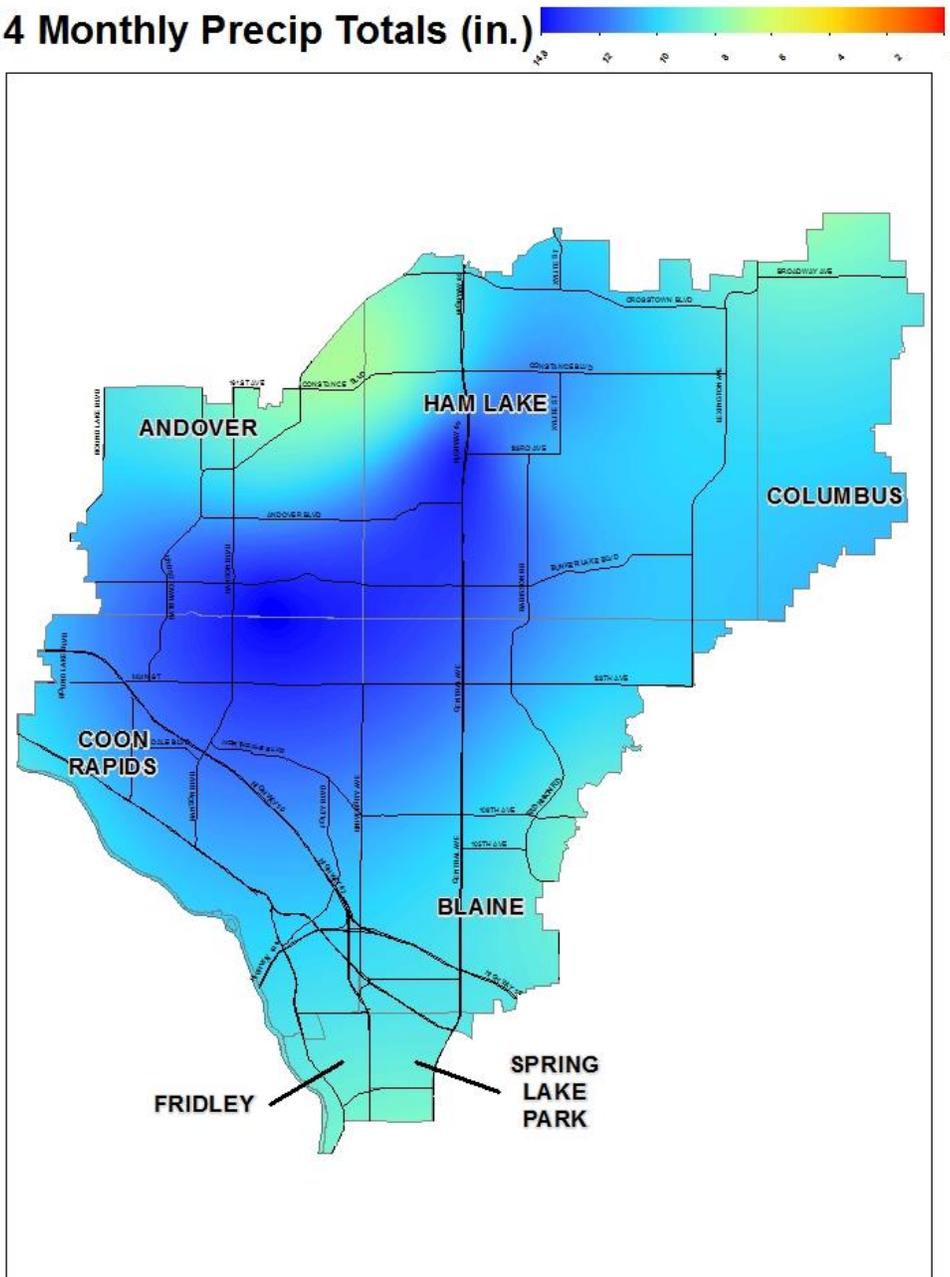
Summary

Throughout 2015, precipitation in the District is likely to become more intense, likely leading to increased flood damage, strained drainage systems, and reduced summer water availability.

- Precipitation in the District is likely to fall more frequently in heavy downpours, which will increase the likelihood of flooding, property damage, travel delays, and disruption in services. In 2014, severe floods occurred in select areas of the watershed and damaged roads and infrastructure.
- More frequent heavy downpours will strain drainage and wastewater systems unless they are rebuilt during the next century. This level of heavy rainfall is projected to occur two to three times as often by 2100.

- Between heavy rainfall events, there will likely be longer periods without precipitation. Increased evaporation during warmer summers could increase the likelihood of water shortages or drought in the District.
- Precipitation is less likely to fall evenly over the watershed.
- In some areas, water shortages will be less of a problem than increases in runoff or flooding. These effects can reduce the quality of water and can damage the infrastructure that we use to transport and deliver water.

2014 Monthly Precip Totals (in.)



17

June

0 1.25 2.5 5 7.5 10 Miles



Work Force Trends

Watershed management is labor intensive and relies on a specialized work force willing to consistently work hard under often challenging circumstances that can be rife with conflict. The economy is moving in a positive direction, key challenges are emerging around retention, recruiting, workforce costs, generational shifts, diversity, and the role of HR. Here are predictions regarding top HR trends for 2015:

1. Downward Trend in Enrollment and Graduation in Natural Resources.

Undergraduate programs in natural resources programs across the U.S. have been dropping at about 4% per year since the mid-1990s, and currently are at levels less than half of what they were in the 1980s. At the same time, demands for graduates has been increasing due to high rates of retirements in professional workforce and to emerging areas such as ecosystem restoration. A dwindling workforce and a shift in training focus and management strategy and knowledge could have serious implications for the future of water resource management and sustainability. The primary reasons listed for hesitancy in entering the Natural Resource profession were uncertainty over job availability, low wages, and concerns over negative public image of the ‘environment’ and ‘government.’

2. Generational Shifts and Succession Planning Will Be Increasingly Hot Topics.

The U.S. Bureau of Labor Statistics predicts that in 2015-2016, millennials will overtake the majority representation of the workforce as Baby Boomers retire in greater and greater numbers. Millennials are known to have significantly different expectations for their employment experience. We will face challenges of engaging and retaining newly hired Millennials while also ensuring the knowledge and skills of retiring Baby Boomers are maintained.

3. Organizations Will Double-Down on Retention and Recruiting.

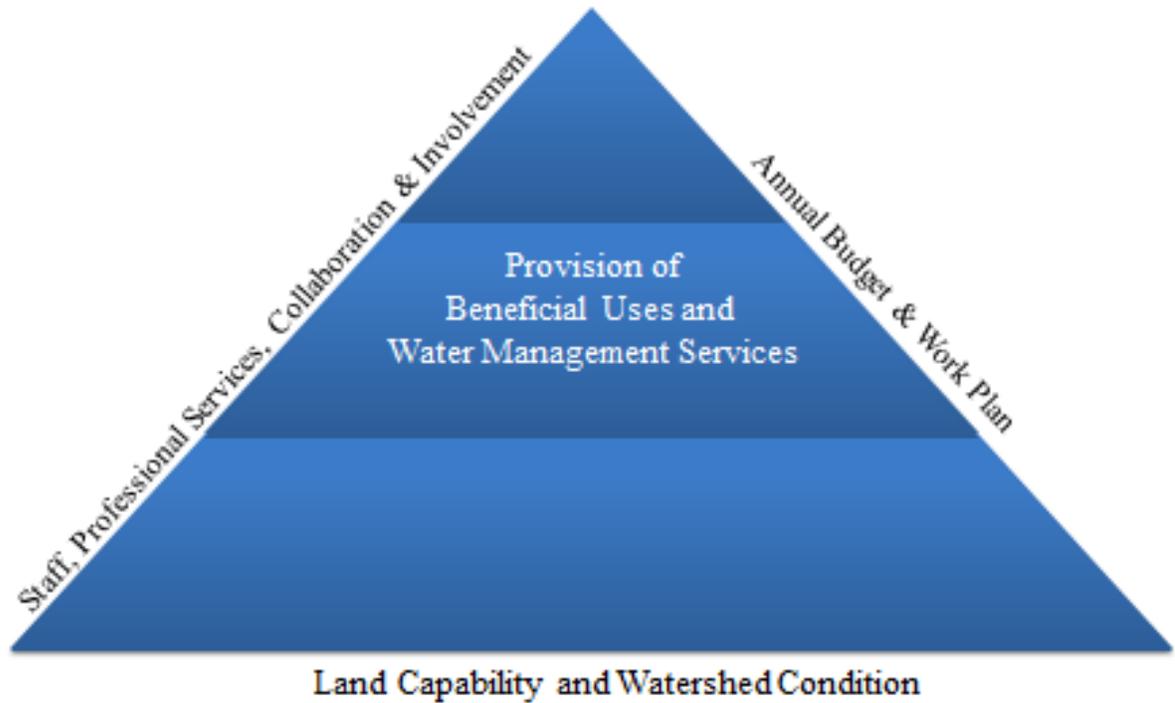
We are in the job-hopper era. Workers seldom stay with the same organization for seven-plus years like they did a generation ago. Millennial workers often stay an average of two years before leaving. The District experienced this from 1995 to 2005. With the average cost of recruiting and training millennial workers in this field approaching an estimated \$20,000, the District should consider ever refining a culture of loyalty to hold on to quality employees.

4. From Analyzing the Past, To Planning And Predicting The Future.

With a growing economy comes heightened competition which drives the need for more agile business strategies to take advantage of newfound opportunity – before the competition catches up. Reacting to past trends will not give the business the insight necessary to align and act. HR will look to more sophisticated workforce plans that incorporate data projections and increase workforce decision agility. They will also implement regular forecasting to ensure plans remain on track, that the business can react to changing needs, and that the business strategy is on track in people resources and costs.

District Ability to Respond to Projected Demand

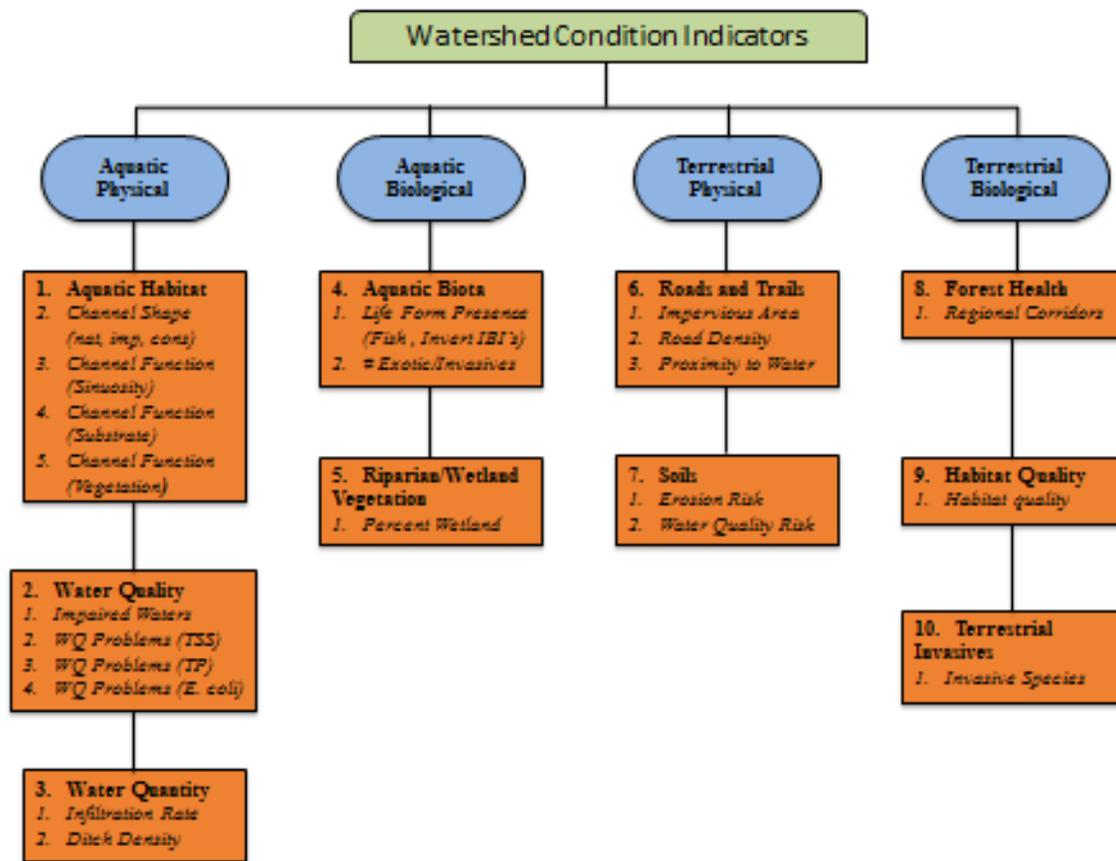
Factors for Providing Beneficial Uses and Water Management Services



Land Capability and Watershed Condition

In 2014 the District conducted a comprehensive assessment of the watershed. The objectives of the assessment were:

1. To assess long-term trends of watershed conditions as influenced by integrated land use practices.
2. To assess the changes in watershed capability to produce resource outputs that result from changes in watershed condition.
3. To use a consistent and scientific approach to land management and to assess, protect, and restore watershed condition.

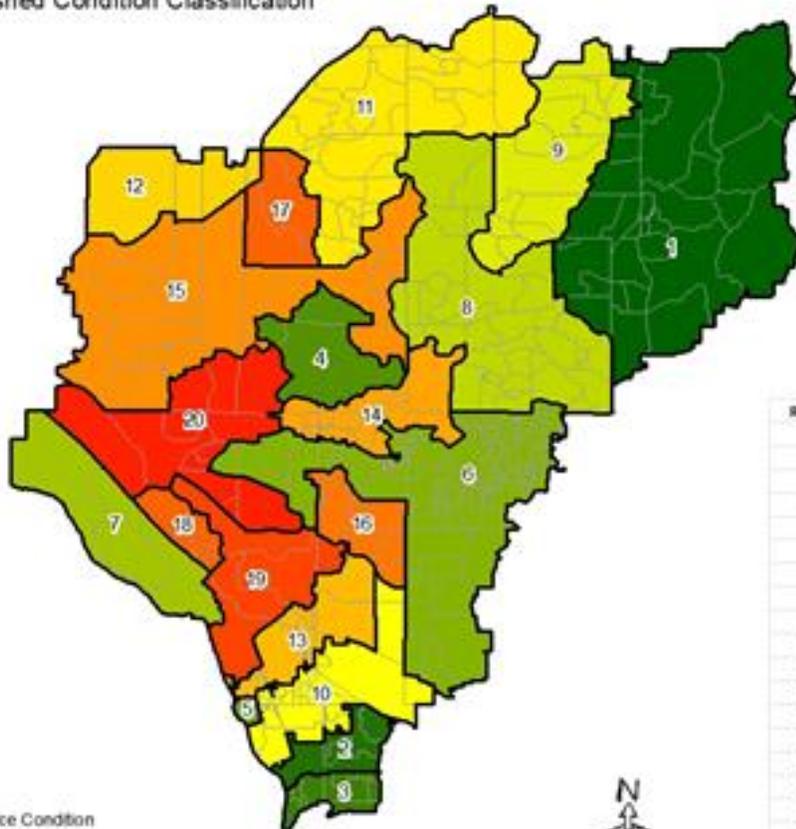


All of the District's subwatersheds exhibit moderate integrity. The geomorphic, hydrologic, and biotic elements are all of moderate integrity relative to their natural potential condition.

- Portions of the watershed exhibit an unstable drainage network.
- Physical, chemical, and biologic conditions suggest that soil, aquatic, and riparian systems are at risk in being able to support beneficial uses.

The result is a classification of moderate integrity meaning that the current state of the processes controlling the yield, timing and quality of water in a watershed is not pristine but is not so degraded that complete dysfunction or failure of the hydrologic system and its dependent systems is not imminent. Of note is that the entire watershed runs nearly the full range of natural systems with moderate classification (scores 2.143 to 1.701)

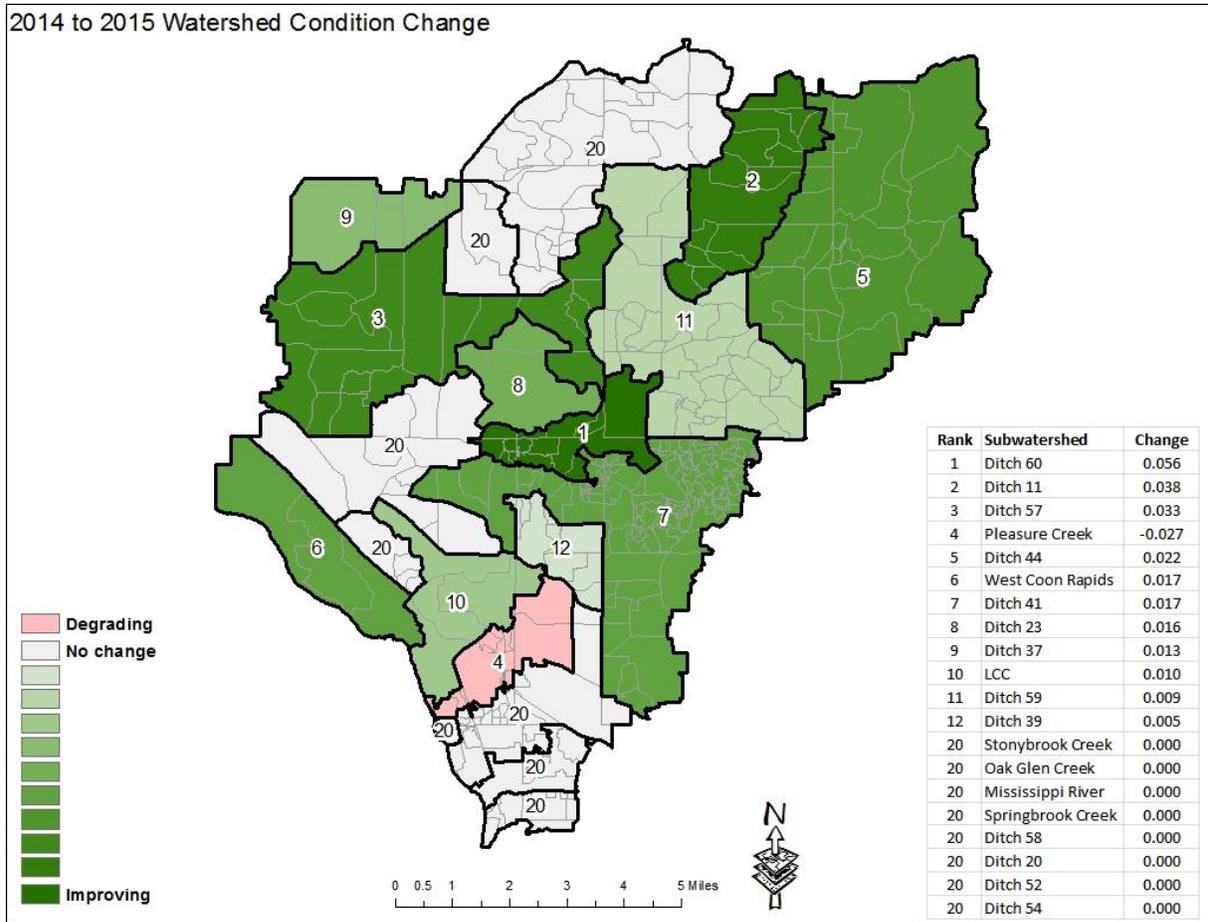
2015 Watershed Condition Classification



Rank	Subwatershed	Score
1	Ditch 44	1,680
2	Stonybrook Creek	1,748
3	Oak Glen Creek	1,803
4	Ditch 23	1,856
5	Mississippi River	1,883
6	Ditch 41	1,893
7	West Coon Rapids	1,894
8	Ditch 59	1,918
9	Ditch 11	1,965
10	Springbrook Creek	2,016
11	Ditch 58	2,024
12	Ditch 37	2,035
13	Pleasure Creek	2,093
14	Ditch 60	2,122
15	Ditch 57	2,132
16	Ditch 39	2,143
17	Ditch 20	2,158
18	Ditch 52	2,158
19	LCC	2,180
20	Ditch 54	2,197

U.S. Forest Service Condition
 1-16 High Integrity
 17-22 Moderate Integrity
 23-30 Low Integrity





Summary

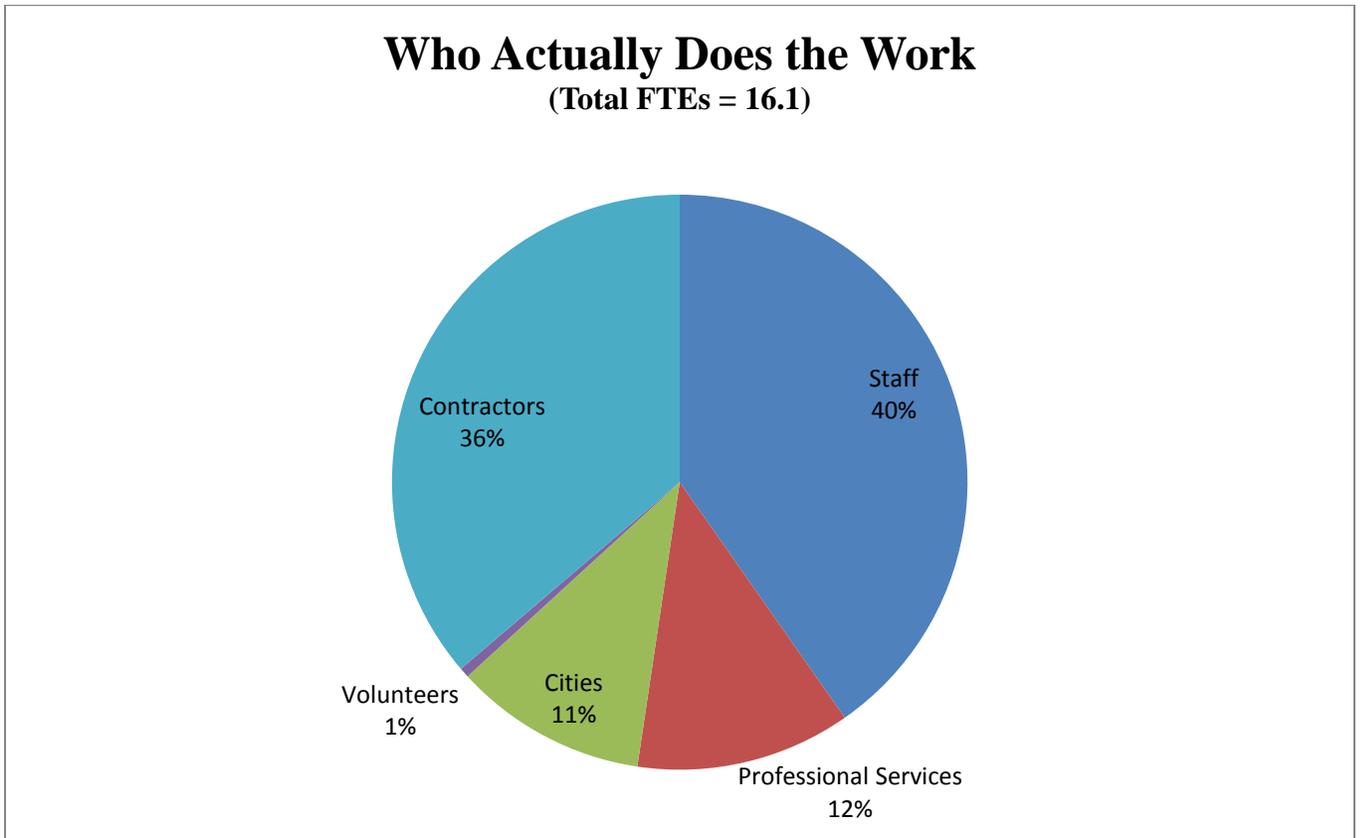
The strength in the condition of the watershed are that the water and related land is capable of improving, but will need direct and active management across the watershed.

The weakness of the current condition is that approximately 25% of the system is unstable to close to not being able to provide demanded beneficial uses, or provide them with any consistency or certainty

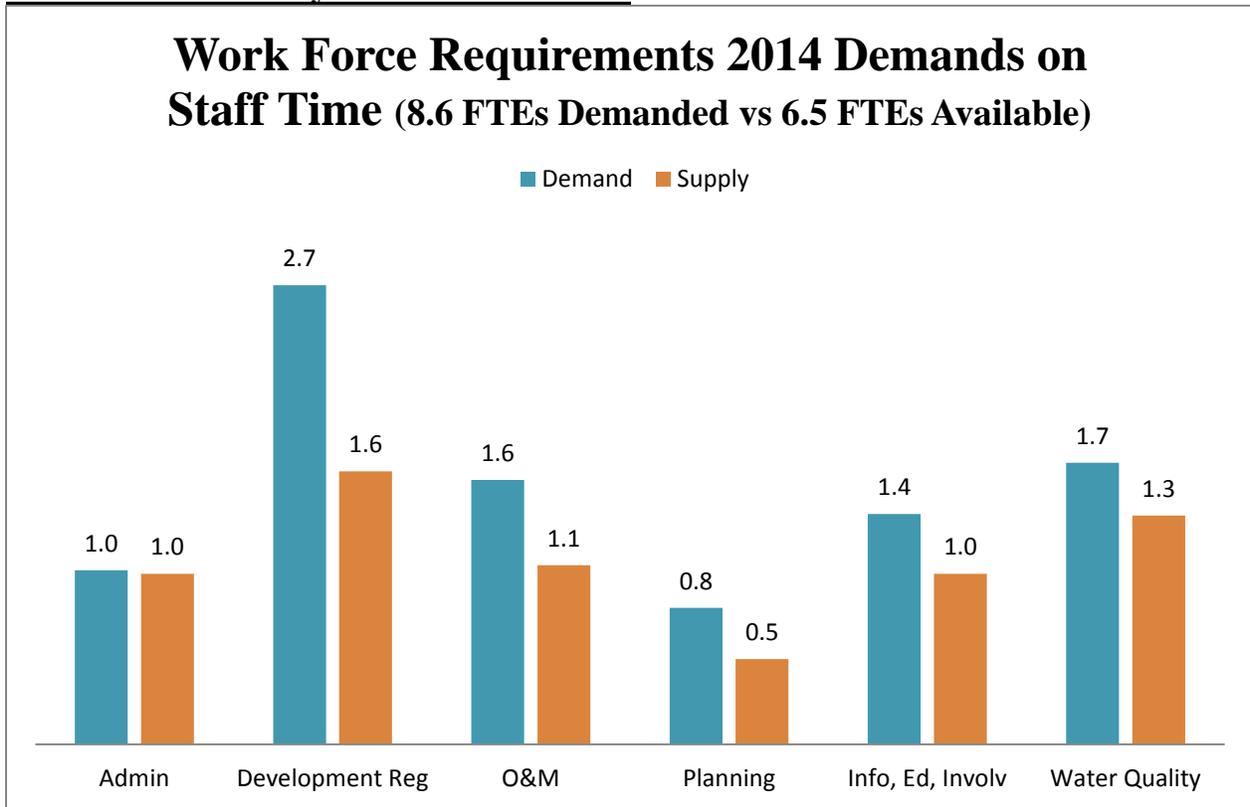
Staff, Professional Services, Collaboration & Public Involvement

Planning for and managing the work force requires the analysis of the numbers and kinds of people and the skills needed to accomplish constantly changing priorities and programs and considers alternative ways of doing business using:

1. District Staff
2. Professional Services and Consultants
3. Collaboration with City and County Staff
4. Volunteers and Public Involvement
5. Contractors



Staff and the Ability to Get Work Done



Summary

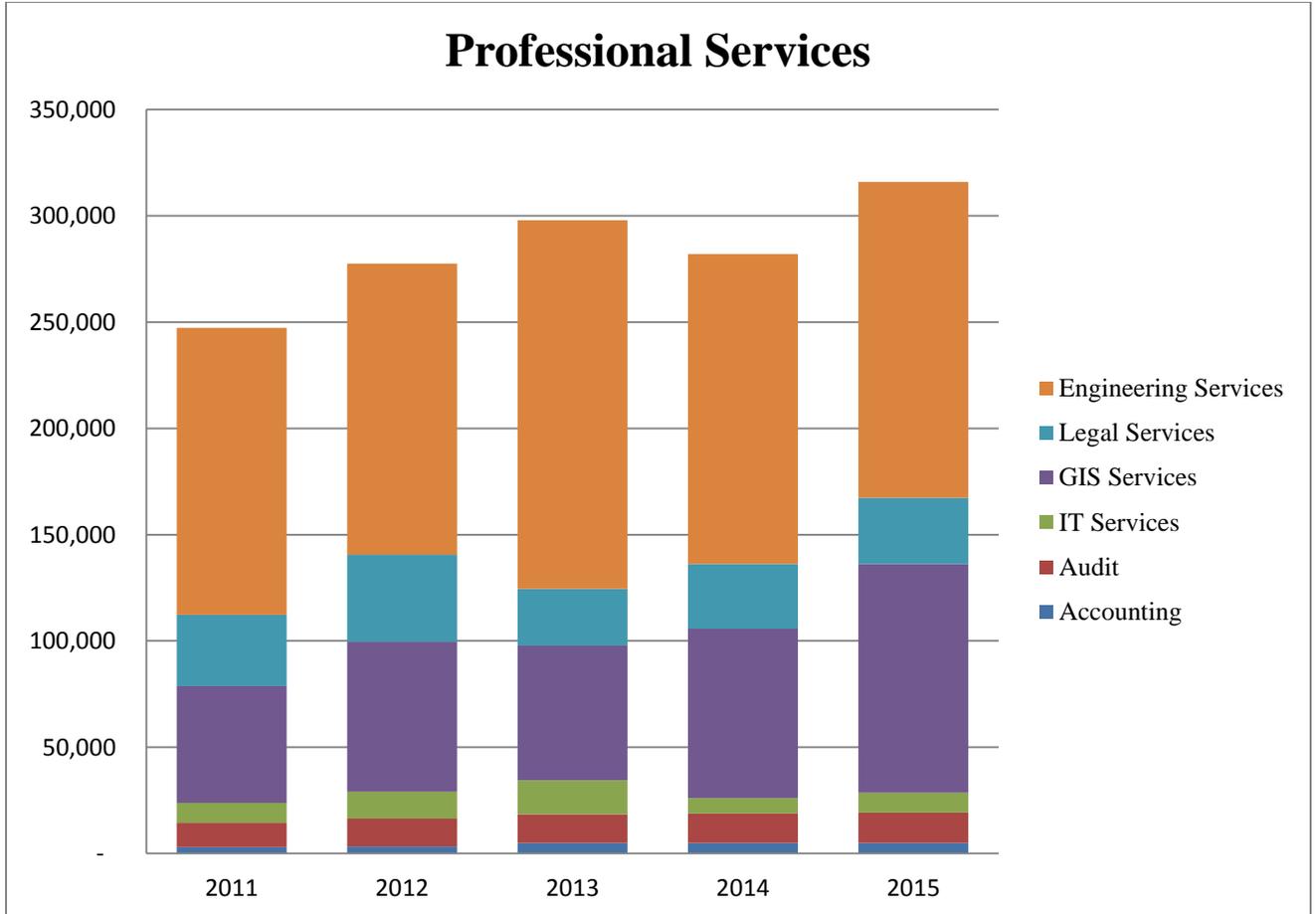
The strengths of the District relative to getting work done are:

- The District has been able to attract and retain good people through a healthy work environment, that is professionally challenging and pay on par with local alternatives
- The District maintains a good alignment of knowledge skills and abilities
- District staff and professional staff maintain good and strong technical skills

The single biggest weakness is that demand on staff time is outstripping the supply and that this is occurring in activities where the District has legal obligations to respond in a timely manner and traditional methods of prioritizing or excluding some participants is not an option

Professional Services & Contractors

Services of special technical or unique functions performed by independent contractors or consultants whose occupation is the rendering of such services.



Summary

The District has several strengths in its professional services group:

1. The strength and quality of the services.
2. Line consultants (engineering and legal) are adaptable.
3. Line consultants retain significant institutional knowledge
4. Complement technical strengths of District staff
5. Service delivery is well tailored (versus generic) to District priorities & style
6. Overall good value.

The weaknesses of the District professional services cadre are:

1. Retention of significant institutional knowledge.
2. Dedication and loyalty of some service providers

Collaboration

Partnerships between local, State and Federal agencies are essential in the planning, development and operation of water and related resource management facilities and infrastructure. These partnerships have helped resolve many conflicts and problems within the Watershed. To fully comprehend and evaluate relationships between these entities, it is important to first understand each entity's current role in water management.

The Coon Creek Watershed District has responsibilities as a land manager in development of water resource projects within the District. These projects often occur within more than one city within the watershed. In addition, efficiently and effectively accomplishing these projects depends to the great degree on partnerships and collaboration with the cities. Specific issues and the District's goals relative to partnerships and collaboration include:

Cooperative relationships between all governmental units managing water within the watershed are vital to the District's water resources.

- The District maintains good and regular relationships with

Governmental Unit	Number
Cities & County	8
NPDES Municipal Separate Storm Sewer Systems	7
State Agencies	3
Anoka Conservation District	1
Lake Associations	2
Federal Agency	1
Total	20

- Contact is typically related to permits, management practices, or through one or both of the advisory committees

Recognition that the quantity and quality of future water resources will impact stakeholders across municipal and watershed district jurisdictions.

- While all of the local units have local water plans and SWPPPs, there remains a concern that some key staff, and their supervising councils, don't recognize the long term economic benefit and necessity of managing the quantity and quality of water both within and outside their jurisdictions

Clear and frequent communication is necessary to identify operational and procedural flaws and avoid financial issues.

- The Technical Advisory Committee is involved in the development of the District's annual budget.
- District staff is typically in daily contact with city engineering or public works staff

High legal costs required to settle disputes related to water and related land resource use issues must be avoided.

- The District has not experienced any legal or settlement costs in the past 20 years.

Effective communication between entities is necessary to avoid constraining future collaborative efforts.

- Water management contains the inherent conflicts associated with economically scarce resources. The District works under a philosophy that is heavily influenced by utility. It also works under a policy of using the science to identify problems, the consequences and the field of choice. The District implements this policy through an effort to “seek first to understand” before advocating its position and need. This approach is constantly put to use and allows for evidence-based practice, a common understanding of goals and the possibility of creatively or innovatively addressing the need.

To coordinate Watershed District water resource protection, development, and improvement programs with similar programs of other Federal, State, and local agencies.

- In 2014 the District coordinated permit reviews and inspections with 6 of the seven cities.

To assess effectiveness of management in meeting legislative mandates, such as those pertaining to pollution control and to the securing of favorable conditions of streamflow.

- Beginning in 2015 the District will begin to receive local water plans required by the Metropolitan Water Management Act. The diagnostic portion of these plans, or their reference and utilization of the District’s comprehensive assessment will be used to assess progress on this goal.

To plan and execute a coordinated program of water resource development to maximize public benefits within the Watershed.

- Beginning in 2014 the District began to formally review and attempt to coordinate projects with the cities and Anoka County. The District has done this on an informal basis (Woodcrest Creek bank stabilization and pond, University Avenue Reconstruct, Woodland Wetland Restoration); it has begun the formal coordination of Capital Improvement Plans and budgeting. These efforts are extremely involved and may take several years and budget cycles to determine their efficiency and efficacy.
- Throughout 2013 and 2014 the District was closely involved with all of the cities within the watershed, the MDNR and MPCA in developing a Watershed Restoration Assessment Plan (WRAP) and subsequent calculation of a Total Maximum Daily Load (TMDL) for select portions of the watershed’s drainage system

To develop and maintain partnerships with the cities and appropriate State agencies to jointly establish and meet water and related resource goals, objectives, and standards.

- The Coon Creek Watershed District maintains a formal relationship with the City of Blaine for inspection of the open channel ditches within the City that are not County Ditches. These inspections are intended to assess the condition of these portions of the City’s stormwater discharge system and meet the requirements of the City’s NPDES permit.

To cooperate with other agencies, conservation organizations, concerned landowners, and individuals in all appropriate aspects of water and related resource management.

- District staff was invited to two cities (Fridley and Ham Lake) to provide training in erosion control inspections, expectations for well managed construction sites and to facilitate coordination between District staff and local building officials.

To promote sound integrated planning, development, and utilization of water and related resources on public and private lands within the watershed.

- The District administers both a permit review and inspection program that is coordinated with the Cities. As the Local Governmental Unit that administers the Wetland Conservation Act over most of the District and an MS4, the District works closely with City Planning and Engineering in review and inspection of proposed projects, and projects under construction to reduce unneeded repetition.

To encourage communication and active participation of local staff in decision making.

- The District maintains an open door policy and always maintains a seat on the District's Technical Evaluation Panel for appropriate city Staff.
- Due to the increasing complexity of state and federal rules and the ubiquitous nature of the public ditch system, District staff is in constant contact with city engineers to ensure coordination and lack of repetition.

To establish coordinated water management practices on geographically interrelated public and private lands.

- In 2014 the District Technical Advisory Committee agreed to pursue a "Categorical" approach to addressing the impairments and TMDLs within the watershed. This approach will allow for a much more efficient and effective approach to water quality management by equally sharing responsibility..
- The District has a rich history of constructing or conducting practices or projects that cross city boundaries and may involve cost share from one city for construction in another. The City of Blaine's contribution to the Woodcrest Creek Bank stabilization in Coon Rapids is an example.

Summary

The District has several strengths in its collaborative efforts:

7. With the Board's increased interaction with City councils and the County Board the District now maintains good involvement at all levels of the organizations with which it collaborates.
8. The District is very intentional at maintaining an awareness of the problems and issues facing the organizations with which it collaborates
9. The District has a good track record of making beneficial contributions to its involvement with the cities and Anoka County, including staying out of the way to keep things simple when appropriate.
10. The strength and quality of the District services.
11. The cities and Anoka County have appeared satisfied with the District's work and roles within the watershed and exhibited loyalty to the District in its provision of services.
12. The District has bolstered its image among city staffs and the majority of council members

The District's weakness is its image among newly elected officials and members of the public because of its status as a governmental unit, their past experiences or their beliefs about watershed districts. This is planned to be addressed in 2015 through City Council briefings.

Public Involvement & Volunteers

The Watershed District Public Involvement Program is an organized effort to ensure public involvement in District planning and decision-making processes. The objectives of conducting information, education and involvement programs and activities are to:

1. Increase public awareness of and understanding of Watershed District programs, activities, benefits, and services, and stewardship of water and related resources.
2. Facilitate the participation of individuals, organizations, groups as well as State, and local governments and agencies in Watershed District decision-making processes, programs, and activities.
3. Keep groups well informed and obtain their advice and comments on District plans and decisions.
4. Improve public understanding of natural resource management, protection, and use.
5. Build relationships with stakeholders of place and interest and develop their trust through cooperative activities of mutual interest and benefit and collaborative management.

The Watershed District carries out public involvement activities and programs pursuant to various statutes and Administrative Rules that require the District to give the public notice of and an opportunity to comment on proposed actions and decisions. The major opportunities are:

Public involvement in water and related resource planning

- Held 10 meetings of the District Citizen Advisory Committee
- Responded to concerns of 8 separate property owners on proposal to establish and ‘impoundment’ on County Ditch 44-8.
- Declared an “Emergency” in response to concerns from six property owners on CD 44-3 experiencing flooding as a result of wet spring and a high culvert on Lexington Avenue, Ham Lake

Public involvement in environmental analysis of proposed District actions

- Received approximately 10 to 15 public comments or concerns on permit reviews. Most of these comments are received either through issue reporting or calls prior to Board review. A few are made at the Board meeting. Substantive comments are reviewed and changes or corrections are made to proposed plans.
- Received numerous comments on proposed District projects. Because the interaction became more of a dialog on ongoing refinement versus formal comments on a static proposal, exact numbers a impossible to determine

Public involvement in developing District Rules and Standards

- Reviewed and sought input on District strategic communication plan and identification of ‘Key Messages’

Public Involvement in District annual budgeting process

- Briefed and presented Budget Factors, Rough Draft Budget and Draft Budget to both the Citizen Advisory Committee and Technical Advisory Committee

Public involvement in other water and related land resource management proposals and recommendations

- Developed and implemented 10 “Public Involvement Plans” (PIPs) for projects sponsored or lead by the Watershed District.

Accommodate the public's desire to know about the project, its cost and consequences

- Developed separate Public Involvement Plans (PIPs) for each of the 10 projects conducted by the District in 2014. Methods ranged from formal hearing to open houses to one on one meetings and homes.

Encourage Involvement and Reaching Out to Those Who Matter

- The District conducted 10 projects where individual mailing, notices or door hangers preceded all public workshops and gatherings.

Demonstrate awareness of the public values at play with the project and respond to them

- During the initial public open houses and later project presentations for Woodcrest and Oak Glen Creek, staff fielded questions and concerns and conducted further research to document the good, the bad and the ugly of past management practices by the District, city or developer.

Involve the public early enough in the project

- The first step in all 10 projects conducted by the District in 2014 was to present the preliminary plan to the City involved and/or the property owners directly impacted. This was usually done one-on-one or in small groups followed by an open house.
- Prepared 10 Public Involvement Plans for proposed actions, policy changes, or programs determined to be of the public interest, related to the District’s Mission or pertain to the public health, safety or welfare.

Provide useful and understandable information on the project, opportunities to participate and their obligations

- Information presented in the PIPs, Public workshops and hearings were tailored to the interests of the audience and focused on work to be conducted on their land; within view of their land; what the proposed timing and process was; contact information; how and when they could have input-including telephone or web access; and clarification of how the project would be financed (grant, tax, special assessment)

Summary

The District’s strengths in dealing with the public are its:

- Transparency and reliance on collaboration and involvement
- Adaptability (within constraints such as notice, and review requirements)
- Frequent communication, tailored for specific audiences

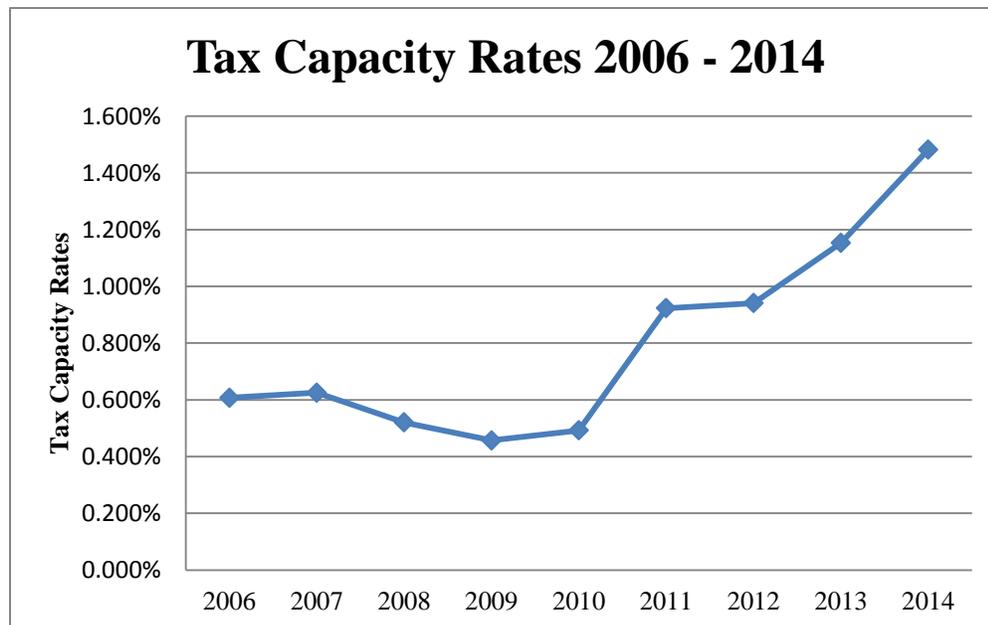
Annual Budget and Work Plan

Fiscal Capacity and Budgeting: Fiscal capacity is a measure of the ability of a jurisdiction to raise revenue. The fiscal capacity of the Watershed District depends on a variety of factors including industrial capacity, natural resource wealth and personal incomes.

When the District discusses its fiscal policy, determining fiscal capacity is an important step. Identifying fiscal capacity gives the District a good idea of the different programs and services that we will be able to provide our citizens. It also helps determine the tax rate necessary to provide a certain level of programs.

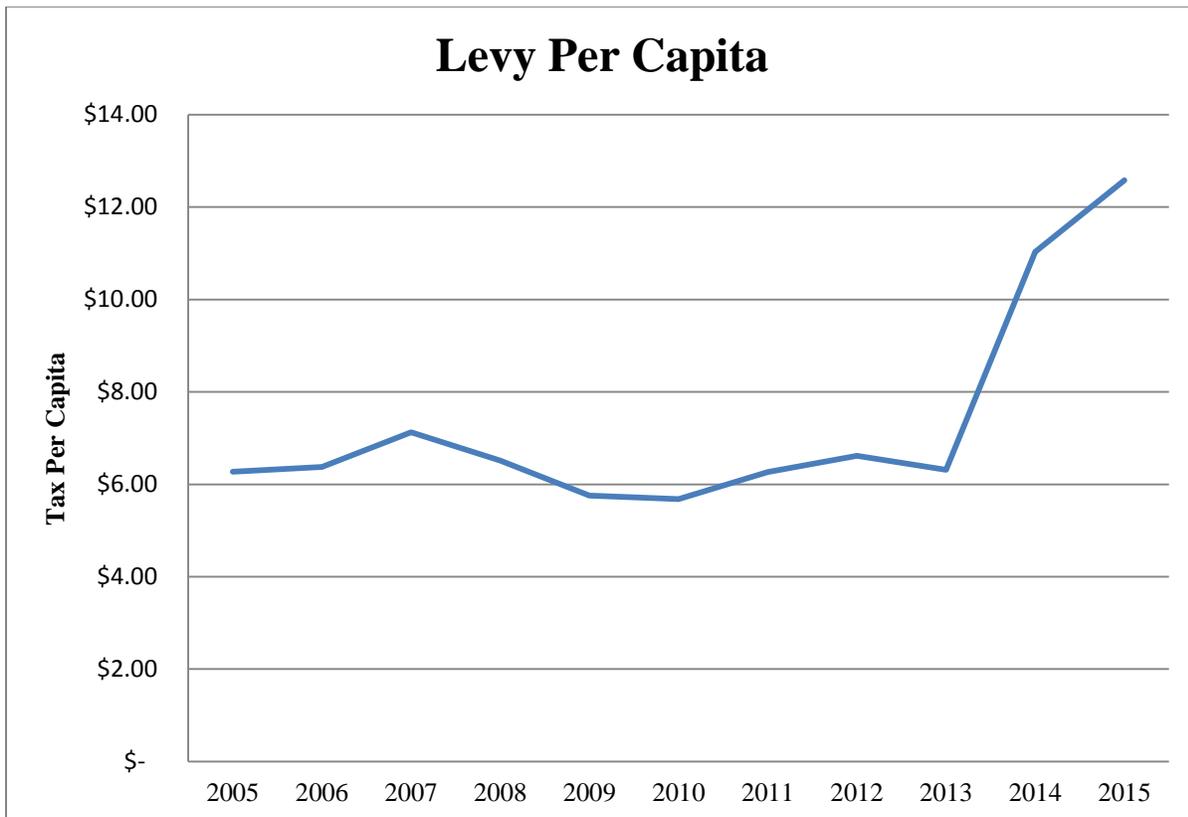
The index of fiscal effort (Tax Capacity rate) compares the actual revenue collected with the potential revenue it could collect, or its fiscal capacity. To calculate the fiscal effort index, the actual revenue collected by the government from specific revenue sources is divided by the measure of fiscal capacity. Thus, fiscal effort takes the amount of revenue collected and divides it by the amount of revenue that could be collected to express the jurisdiction's revenue generating effort as a percentage.

Year	Tax Capacity Rates	% Change	
2006	0.607%		
2007	0.625%	2.97%	
2008	0.520%	-16.80%	
2009	0.457%	-12.12%	
2010	0.492%	7.66%	
2011	0.923%	87.60%	
2012	0.941%	1.95%	Merger
2013	1.153%	22.53%	
2014	1.482%	28.53%	



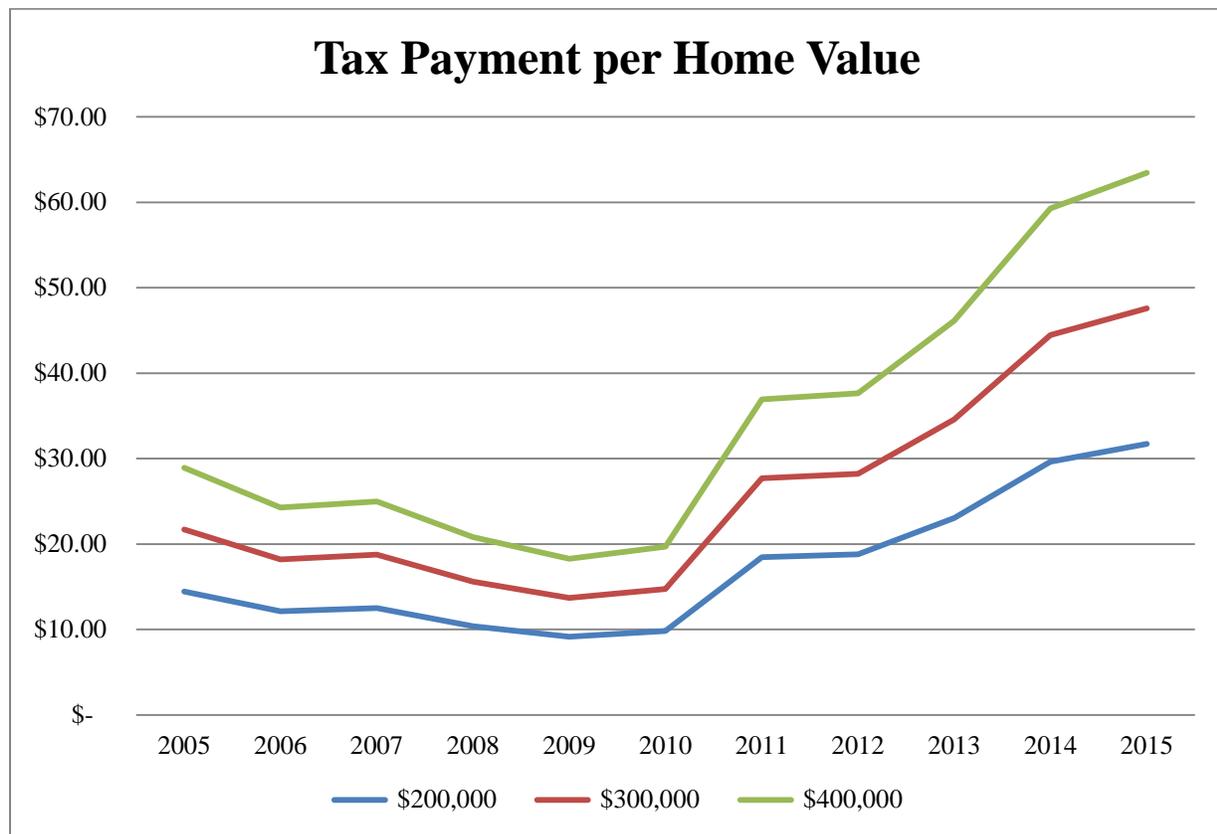
Tax per Capita and Willingness-to-Pay: Indicates the amount each person within the watershed would pay if the levy was distributed on an individual basis. This information is contrasted by Willingness-To-Pay which has been determined to be between \$25.00 and \$100.00 per year for two thirds of the population.

Year	Population	Levy	Levy Per Capita	Pct Change	
2005	99,498	\$ 624,040	\$ 6.27		
2006	100,503	\$ 640,623	\$ 6.37	2%	
2007	101,519	\$ 723,656	\$ 7.13	12%	
2008	102,544	\$ 667,847	\$ 6.51	-9%	
2009	103,580	\$ 596,482	\$ 5.76	-12%	
2010	104,626	\$ 594,607	\$ 5.68	-1%	
2011	135,571	\$ 849,111	\$ 6.26	10%	
2012	143,461	\$ 949,150	\$ 6.62	6%	Merger
2013	153,434	\$ 969,150	\$ 6.32	-5%	
2014	164,983	\$ 1,819,550	\$ 11.03	75%	
2015	166,138	\$ 2,089,941	\$ 12.58	14%	



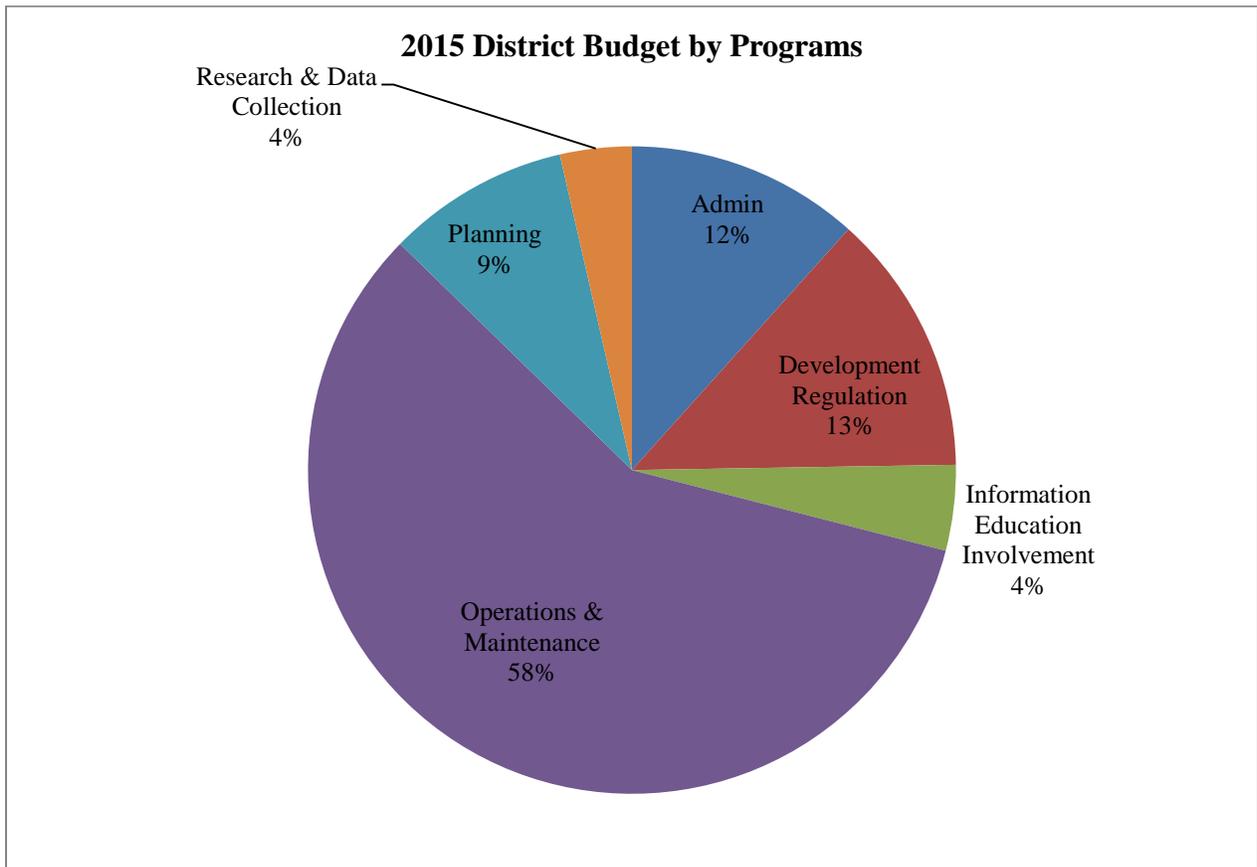
Annual Tax Payment to District

Year	Tax Rate	Home Value		
		\$ 200,000	\$ 300,000	\$ 400,000
2005	0.723%	\$ 14.46	\$ 21.69	\$ 28.92
2006	0.607%	\$ 12.14	\$ 18.21	\$ 24.28
2007	0.625%	\$ 12.50	\$ 18.75	\$ 25.00
2008	0.520%	\$ 10.40	\$ 15.60	\$ 20.80
2009	0.457%	\$ 9.14	\$ 13.71	\$ 18.28
2010	0.492%	\$ 9.84	\$ 14.76	\$ 19.68
2011	0.923%	\$ 18.46	\$ 27.69	\$ 36.92
2012	0.941%	\$ 18.82	\$ 28.23	\$ 37.64
2013	1.153%	\$ 23.06	\$ 34.59	\$ 46.12
2014	1.482%	\$ 29.64	\$ 44.46	\$ 59.28
2015	1.586%	\$ 31.72	\$ 47.58	\$ 63.44



District Budget

	2011	2012	2013	2014	2015
Revenues					
Property Taxes	\$ 849,111	\$ 949,150	\$ 969,150	\$ 1,819,556	2,089,941
Special Assessments	-	1,800	1,800	1,800	1,200
Fees & Charges	19,850	13,950	30,380	48,380	75,500
Other Revenue	490,196	31,722	89,574	128,323	53,801
Total	\$1,359,157	\$996,622	\$ 1,090,904	\$ 1,998,059	2,220,442
Expenditures					
Salaries & Benefits	331,621	328,038	402,554	594,872	661,723
Professional Services	247,227	277,569	297,836	281,915	315,936
Operating Expenses	70,670	78,740	110,450	118,114	147,654
Other Program Costs	134,903	313,724	728,101	901,814	1,018,330
Capital Equipment	31,364	4,562	36,102	113,249	76,800
TOTAL	\$815,785	\$1,002,633	\$ 1,575,043	\$ 2,009,964	2,220,442



Capital Project Plan					
	2015	2016	2017	2018	2019
New Drainage & Facilities	\$ 323,490	\$ 275,885	\$ 53,180	\$ 329,690	\$ 404,432
Ditch & Streambank Repair	\$ 451,680	\$ 221,978	\$ 413,746	\$ -	\$ 398,904
Streambank Stabilization	\$ 72,900	\$ 40,500	\$ 39,150	\$ -	\$ -
Retrofit Construction	\$ 35,943	\$ 68,971	\$ 921,398		
Special Studies & Management Plans	\$ 63,900	\$ 67,900	\$ 62,900	\$ 36,300	\$ 3,800
Total	\$ 939,013	\$ 667,335	\$ 1,487,474	\$ 356,290	\$ 803,336

Summary

The strengths of the District's finances are that the District has:

- Ample access to capital
- The ability to continue its water and related resource management efforts
- Exhibits good financial stability
- Maintains sufficient liquidity and reserve to meet state minimum requirement

The District's financial weaknesses are that it:

- Accesses a very small percentage of its financial capacity
- Is inadequate in its fees and taxes
- Maintains inadequate reserves to meet both the required demands placed on it, and to quickly and adequately respond to emergencies or natural disasters without compromising general mission related operations.

Implications for Water Management

Recognizing emerging issues allows us to be strategic and proactive, improving our vitality in policy development, leadership, and service. This work strengthens our ability to bring multiple disciplines together to solve problems and promote opportunities in complicated societal and natural resource issues. Recognizing and acting upon emerging issues increases our credibility as a profession and helps assure that we are in-touch and better able to meet the public's expectations of the profession.

Implications for the Water Cycle and Water Demand

The water cycle is a delicate balance of precipitation, evaporation, and all of the steps in between. Warmer temperatures increase the rate of evaporation of water into the atmosphere, in effect increasing the atmosphere's capacity to "hold" water. Increased evaporation may dry out some areas and fall as excess precipitation on other areas.

Changes in the amount of rain falling during storms provide evidence that the water cycle is already changing. Over the past 50 years, the amount of rain falling during the most intense 1% of storms increased by almost 20%.

- Increased rainfall intensity has led to increased stream power causing channel and bank stability problems.
- Warming winter temperatures cause more precipitation to fall as rain rather than snow.
- Temperature variability can cause snow to begin melting earlier in the year which alters the timing of streamflow.

As temperatures rise, people and animals need more water to maintain their health and thrive. Many important economic activities, like raising livestock, and growing food crops, also require water. The amount of water available for these activities may be reduced as Earth warms, and if competition for water resources increases.

Implications for Agriculture, and Aquatic Ecosystems

In the next 5-10 years, climate change could help or harm agriculture, and aquatic ecosystems in the District.

- On one hand, where sufficient water and other nutrients are available, crops may benefit from a longer growing season and increased levels of carbon dioxide.
- On the other hand, climate change may negatively impact the health of crops, and animals in the region.
 - Wetter conditions in the spring may make it difficult for farmers to plant their crops.
 - More frequent heat waves, floods, and droughts, as well as larger populations of harmful insects, will likely place additional stress on the District's agriculture.
 - Climate change is likely to alter fish populations in the District with fish such as smallmouth bass, and bluegill projected to replace stocked or cooled water species that might occur within the watershed.

Lakes and wetlands are key features of the watershed's geography and society. In addition, fish are harvested from the lakes, providing recreation.

- Climate change is likely to increase evapotranspiration. Increased evaporation could cause water levels to drop in lakes and some wetlands by one to two feet by the end of the century. Although such a drop in water levels could benefit public beach access, it could adversely affect shoreline and riparian ecosystems. Lower water levels would also make some channels too shallow for navigation and open more areas to AIS.
- Warmer temperatures may, however, have a positive impact. The net impact of these changes is likely to impose costs on the District through increased maintenance, and repair costs, as well as lost recreation.

Implications for Water Management

This analysis examines the ways expanding populations, increased urbanization, and changing land-use patterns could profoundly impact water and related natural resources, including water supplies, during the next 50 years.

Significantly, the analysis shows the potential for significant loss of water and related resources to development and fragmentation, which could substantially reduce the beneficial uses from water resources that the public now enjoys including clean water, wildlife habitat, recreation and others.

District staff's review of development trends, population growth and the demands for the beneficial uses provided by the watershed concluded that:

- Urban and developed land areas in the watershed will increase 29 percent by 2020.
- Water and related resources will be most impacted by this growth.
- Citizen focus will increasingly be on appearance of the resources and infrastructure operated by or affiliated with water resources.
- Increased time will be demanded and required by the public to understand both project and permit requirements
- Over the long-term, climate change could have significant effects on water availability, making the watershed potentially more vulnerable to water shortages. Recent trends in agricultural irrigation and landscaping techniques will boost water demands increasing the scarcity of water.
- Lake and wetland areas will decline as a result of development and declines in surficial groundwater, where population is projected to grow the most;
- Wetland areas are expected to continue their slow decline, but many of the benefits provided by the wetland areas will remain stable and may be sufficient to meet water storage and treatment demands;
- Biodiversity may continue to erode because projected loss of forest and shrub land will impact the variety of species;
- Natural resource based recreation use is expected to trend upward.
- Increased population will lead to increased probability of AIS infestations, leading to increased demands on prevention and rapid response probably of the District.

The mission of the Watershed District is to manage ground water and the surface water drainage system to prevent property damage, maintain hydrologic balance and to protect water quality for the safety and enjoyment of citizens and the preservation and enhancement of wildlife habitat.

The District manages over 68 thousand acres of land, provides assistance to public and private landowners, and conducts an effective water monitoring program. Watershed District protects more than \$13 billion in land and associated assets.

Issues

1. The age, condition and adequacy of existing stormwater infrastructure to meet changing climatological demands to prevent flooding and water quality demands to overcome existing impairments.
2. Insufficient staff to adequately address permit applications with legal timelines.
3. Insufficient staff to address issues and respond to increasing occurrence of natural disasters and corrective maintenance.
4. Inadequate financial reserves to respond to emergencies, natural disasters and rapid response needs
5. Inefficient and ineffective use of the District financial capacity
6. A greater need by the public to engage staff and more staff time required to explain projects or permit requirements to the public.
7. Pending Bacteria TMDL on the Mississippi River
8. Aging population and shift in resource demands.
9. Agricultural expectations of growing high value crops (corn and soy beans) not well suited to organic soils, high water tables or periods of time in excess of 24 hours of saturation or flooding.

Needs

1. Policies, that are flexible and adaptive enough to be effective under a wide range of future socioeconomic and ecological conditions.
2. Two Full-Time Equivalent staff people to address work needs in:
 - a. Land use review
 - b. Permit inspection
 - c. Enforcement
 - d. Operations and maintenance
 - e. Monitoring
 - f. GIS
3. Contingency funds for natural disasters and rapid response
4. More fully utilize the District's financial capacity
5. Begin process of seeking office space.