

**Minnesota Governor's Council on Geographic Information
Hydrography Committee
and
MetroGIS**

**Hydrographic User Information Needs
Workgroup**

**Final Version
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Turn-Around Document**

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Workgroup
October 29, 1999
Metro County Government Center
St. Paul, Minnesota

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Hydrographic User Information Needs Assessment				
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Welcome

Meeting started at 8:15 a.m.

Maeder thanked all participants for attending and taking a full day out of their schedules to help us with this process. This work is a critical first step toward defining user needs consistent with the cross-jurisdictional data needs for the State of Minnesota and other diverse stakeholders.

Today's Hydrographic Data Needs Assessment is a joint venture between the MetroGIS and the Governor's Council on Geographic Information Council's Hydrography Committee.

MetroGIS Project

MetroGIS is a Geographic Information Systems project that is helping local governments and other organizations share data in the seven-county Twin Cities Area. Its intention is to provide access to many types of information including property records, natural resources, public works, demographics, education, and other areas.

MetroGIS has held sessions to identify business needs for a variety of subject areas. The idea is to identify the top priority information needs in a subject area, identify some basic data specifications, and use this as a basis to develop data sets of broad usability to all Metropolitan users. Past examples of this process include the creation of the TLG (The Lawrence Group) roads base map and addressing database for use in the metro area, and an ongoing effort to create a metro-wide parcels database.

The MetroGIS process involves bringing together "Subject Matter Experts" from a variety of (mainly) public agencies to provide input into needs. The purpose of this session, then, for MetroGIS, is to provide an opportunity for information sharing among participants, and to identify data needs and data specifications which will help to define and build data sets of regional value.

Governor's Council on Geographic Information – Hydrography Committee

The Governor's Council on Geographic Information was created to coordinate the development of geographic information technologies statewide. Many agencies at all levels of government, as well as the private sector and educational institutions, are members of the Governor's Council and its many committees.

The Hydrography Committee was formed two years ago to deal, particularly, with improving the streams and lakes data layers available and to define a data model for this layer that would be flexible and able to be implemented at various scales. The group is also a forum for coordination on other layers. A major activity during this time period has

been coordination of the development of streams and lakes layers at 1:24,000, based on enhancements to the MnDOT Base map rivers and the NWI layers. Major enhancement work in this area has been done by DNR and PCA, but the current layer does not meet all of the needs already identified. The Committee is also tracking federal development of the National Hydrography Dataset.

For the Hydrography Committee, this Hydrographic Needs Assessment is an opportunity to collect additional information on needs from a broader audience, with particular emphasis on local government. It also will serve as a reality check on current development. We have been aware of the needs at the local government level of higher resolution data, but this is the opportunity for us to get specifics from a range of potential users.

Today's Hydrographic User Needs Assessment

This is the first effort to combine the processes of MetroGIS and the Governor's Council Needs Assessments – although the two groups work together on other issues. For the MetroGIS process, it means opening up the discussion to non-metro participants. For the Governor's Council group, it means widening the list of hydrographic features to be discussed so that the needs of MetroGIS can be met.

Maeder started this session by recognizing the people and groups who have made it possible.

- Thanks to MetroGIS – Theresa Foster and Melissa Walker. They have done the lion's share of the work of supporting this session.
We are relying on the MetroGIS for organization, for providing the expertise that they have gained through doing this process in other topic areas, and for providing the materials, facilitator, and, importantly, the food, for the session. Basically it is their methodology and their hard work we are tapping into here.
- Thanks to Marcy Syman of Metropolitan Council – today's facilitator – she did a good job of listening to our needs and helping us tailor a process we thought would work.
- Thanks to the Hydrographic Data Needs organizing committee, which in addition to Theresa and myself included Glenn Radde (DNR) and Ann Banitt (USACE). They helped with defining the process and recommending and recruiting participants. They will also serve as recorders and facilitators of the small group sessions.
- Thanks to Nancy Rader of LMIC, who has agreed to assist as a recorder for today's session.
- Thanks to Nancy Read and the Metropolitan Mosquito Control District, who allowed us to use their great facility for the day.
- And, again, thanks to all of you for being here and being willing to provide your expertise. This is THE critical part of the process.

Agenda, Outcomes, and Ground Rules

Marcy Syman, facilitator, went over the day's ground rules, outcomes for the day and how we intend to proceed through the process.

Ground Rules

Participate Effectively
Encourage Networking
Complete suggested exercises in a timely fashion
Enhance awareness of other organization activities through questions and answers.
Print legibly in "block face" lettering so that all participants can read your comments.

Outcomes

Comment on draft hydrographic feature definitions
Determine data needs for the sixteen features of the hydrographic data model
Prioritize data needs
Create specifications for highest priority needs
Build participant awareness of hydrographic data needs and data issues in Minnesota
Provide an opportunity for meeting participants to network

Agenda

- 1. Registration** **(8:00 a.m.)**
- 2. Welcome** **(8:15 a.m.)**
*Susanne Maeder, Co-Chair Minnesota Governor's Council Hydrographic Committee,
Land Management Information Center*
- 3. Agenda, Outcomes, and Ground Rules**
- 4. Identify and Define Hydrographic Feature Types**
- 5. Identify Priority Hydrographic Feature Types and User Information Needs**
- LUNCH*** **(12:30 p.m.)**
- 6. Desired Specifications for Hydrographic Feature Types**
- 7. Closing** **(3:45 p.m.)**
*Susanne Maeder, Co-Chair Minnesota Governor's Council Hydrographic Committee,
Land Management Information Center
Theresa Foster, MetroGIS Technical Coordinator*

Identify and Define Hydrographic Feature Types

This section represents an attempt to provide a common generic set of definitions of features to be used as a basis for the Hydrographic Data Needs discussion on October 29. The purpose was not to develop a rigorous set of definitions at the meeting, but simply to develop a generalized understanding of a feature that we could work from.

Participants were provided the list ahead of time, and asked to provide comments on these definitions at the meeting. These comments are listed under each feature below. By and large, we were not looking for a legal definition, since in many cases there is more than one legal definition for some of these features. Participants were asked that, if there was a particular legal definition that they were required to use, that they note this in the course of the Data Needs and Data Specifications discussion.

The first source for definitions consulted was the *USGS/EPA Standards for National Hydrography Dataset – High Resolution*. When the definition in NHD was missing or not matching to the set of features used by the group, then other sources were consulted. In some situations, (e.g., floodplains), the legal FEMA definition may be the ONLY definition in broad use, and it would be most appropriate to use it.

Feature: Lakes

Definition:

1. A body of water with predominantly natural shoreline surrounded by land. (*Source: USGS/EPA National Hydrography Dataset*)
2. Clarification: a body of (fresh) water consisting of complexes of open water and Surrounding fringed wetlands. (*Source: Minnesota Department of Natural Resources*)
A standing body of water with a predominantly natural shoreline surrounded by land.

#	Comment	ID
1	There is not much natural shoreline left	DK
2	Highly dependent on perceptions	DH
3	Whether meandered or non-meandered? Who owns the bed? State or private property?	MCD
4	Probably lots of overlap between lakes and wetlands	RMG
5	Lakes, ponds, or swamps – do we need to distinguish between them?	NR
6	Need to distinguish a lake from a wetland	SMC

Feature: Wetlands

Definition:

1. A noncultivated, vegetated area that is inundated or saturated for a significant part of the year. The vegetation is adapted for life in saturated soil conditions. (Source: *USGS/USEPA National Hydrography Dataset*)
2. Lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following attributes: (1) at least periodically, the land supports hydrophytes; (2) the substrate is predominantly undrained hydric soil; or (3) the substrate is nonsoil and is saturated with water or is covered by shallow water at some time during the growing season of each year. (Source: *USFWS, Classification of Wetlands and Deepwater Habitats of the United States,* Cowardin et. al., 1979)

#	Comment	ID
1	What is "significant"? (re first definition)	LVS
2	Have cultivated wetlands	JR
3	In Minnesota, the legal definitions are the most important (Protected Waters Inventory, Wetlands Conservation Act, etc.)	ML
4	Features - - looking for drained wetlands, former basis, what used to be? And what is now?	NR

Feature: River

Definition:

1. a body of flowing water (Source: *USGS/USEPA National Hydrography Dataset*)
2. a natural stream of water . . . flowing in a definite course or channel or series of diverging and converging channels.(Source: *Random House College Dictionary - 1975*)

#	Comment	ID
1	Need to address intermittent streams	JR
2	When (time of year) does water flow?	
3	Watercourses - - > more perceptions	DH

#	Comment	ID
4	“County” ditches further complicate things	RS

Feature: Floodplain

Definition:

A nearly flat plain along the course of a river that is naturally subject to flooding
(Source: Random House College Dictionary- 1975)

#	Comment	ID
1	A national definition exists (FEMA)	DH

Feature: Ditch

Definition:

An artificial open waterway constructed to transport water, to irrigate or drain land, to connect two or more bodies of water, . . . *(Source: USGS/USEPA National Hydrography Dataset)*

#	Comment	ID
1.	Ditches in Minnesota are not usually for the purpose of connecting two bodies of water in Mn <i>(Editor’s Note – this part of the definition related more to ‘canal’ in the National Hydrography Dataset. In NHD “ditch/canal” are defined together)</i>	MJ
2	The definition needs to include altered natural watercourses (a high percentage of ditches in Minnesota are channelized natural watercourses)	
3	Some rivers go into ditches and back again – e.g., Redwood, Cottonwood	

Feature: Drainage Tile

Definition:

An underground system of tiles designed to drain water from the soil and convey it to a natural drainage network.

#	Comment	ID
1.	What is a “tile”?	LVS
2.	Cross out “natural” – most drainage is to artificial features	DH
3.	Source may not be the soil – e.g., in some areas tile lines are run from houses (e.g. septic)	MJ
4.	Terminus is not necessarily a drainage network (may be a landlocked basin)	MJ

Feature: Drainage Tile Inlet

Definition:

The location at which water can enter the drainage tile network.

#	Comment	ID
1	Not narrow enough. Water can enter through the individual tiles (if perforated?)	
2	A place where water is artificially directed	AAB
3	The inlet is the portion above ground	

Feature: Storm Sewer

Definition:

An artificially constructed flowpath, usually underground, constructed for the purposes of transporting stormwater runoff.

#	Comment	ID
1	Definition must be broad enough to include infiltration ponds and stormwater holding ponds	MJ
2	Include above-ground features (ditches, swales) that are part of the stormwater network	

#	Comment	ID
3	Distinguish between stormwater conveyance and stormwater treatment systems	

Feature: Watershed

Definition:

All of the area that may contribute surface water to a given location (*Source: DNR Waters, 1999*)

#	Comment	ID
1	Doesn't address landlocked portion of watershed	DH
2	Wetland watershed breakout	SMN
3	Can be any size	NR
4	Difference between lake watershed and watershed definition? If lake watershed why not river watershed, etc?	CHS

Feature: Lake Watershed

Definition:

The entire area from which water flows into a lake basin (defined at the basin outlet) (*Source: DNR Waters 1999*)

#	Comment	ID
1	Does not address landlocked portion of basin	DH
2	Confusing – how is a stream feeding into a lake handled?	MC

Feature: Meteorological Data

Definition:

Data relating to the science of the atmosphere and its phenomena, including weather and climate. (*Source: Random House College Dictionary, 1975*)

#	Comment	ID
	MUST INCLUDE THE FOLLOWING TYPES OF	

#	Comment	ID
	INFORMATION:	
	- Precipitation (define)	ML
	- Temperature/ Evap.	NR
	- Wind	
	- Snow Coverage	PLD
	- Soil Temperature	

Feature: Sewage Treatment Pond

Definition:

An artificially constructed small basin used for the treatment of sewage wastes.

#	Comment	ID
1	What is “small”?	SA
2	Treatment “systems”	DK

Feature: Well

Definition:

A pit or hole dug or bored into the earth for the extraction of oil, water, other fluids, or gases. (Source: USGS/USEPA National Hydrography Dataset). Note: Accept this definition with the understanding that wells in Minnesota are generally constructed for water extraction or water level monitoring.

#	Comment	ID
1	Add recharge wells	LVS
2	Add wellhead protection areas	SMN

Feature: Spring

Definition:

1. A place where water issues from the ground naturally (*Source: USGS/USEPA National Hydrography Dataset*)

- The issue of water from the earth taking the form, on the surface, of a stream or a body of water (*Source: Random House College Dictionary – 1975*)

#	Comment	ID
1	Common term	DH
2	Where ground water becomes surface water?	NR
3	Recharge areas	SM
4	Seasonal changes	JR
5	Doesn't need to reach surface of the lake	MCD

Feature: Ground Water

Definition:

- The water beneath the surface of the earth. (*Source: Random House College Dictionary, 1975*)
- The water contained in interconnected pored located below the water table in an unconfined aquifer or located in a confined aquifer. (*Source: C.W. Fetter, Applied Hydrogeology, 1988*)

#	Comment	ID
1	Is confined/unconfined important?	GMD
2	Ground water/ aquifer – distinguish other characteristics? I.e., ground water in and of itself is amorphous and ill defined as an area – you need something like an aquifer boundary or a well to define its location.	DH

Identified User Information Needs

This section represents the user information needs by feature type. The purpose was to develop a list of user information needs about a specific feature in order to use this list as a starting point for creating hydrographic data or enhancement of hydrographic data that is already available or currently being developed. The needs of users are relative to any data set development or enhancement project and in this case users were asked to vote at the end of this exercise on priority feature type as well as priority user information need. The summary of both MetroGIS and Statewide interest are documented as well as the prioritization of feature types.

In the course of the listing of data needs for each feature, some needs naturally were grouped together into topic areas. In some cases, these needs were voted on as a group, rather than as individual data needs. A “cluster” of needs is identified in the data needs listing by a set of characters (e.g., “###” or “***”) following each data need in the cluster. In the voting column, the primary data need is given the number of votes (followed by ‘cl’ for cluster), and the other data needs in the cluster were given an ‘X’. Basically, the entire group of needs is treated as a set, and assigned the vote total for the cluster. Information need votes are tabulated in the last column (Note: V-M (Votes by Metro Area Participants) and V-S (Votes by State Participants)).

Feature: Lakes

Feature Votes: 5 Metro; 13 State

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Lake bathymetry (depth contours)	JW MJ	2	7
2	Physical information – size and depth; Protected Waters status	RS TAR		
3	Lake watershed delineation	RS		
4	Management of inlet/outlet structures (what, who, how often, etc.)	SA		
5	Location and elevation of controlled discharges. Where do controlled releases go?	LVS TAR		1
6	Historical lake levels	SA		
7	Historic lake levels and outflow amounts	PLD		
8	Drained lake beds –where are they?	SW		

#	Business Information Need (I need to know)	ID	V-M	V-S
9	Land use and cover within floodplain	JR		
10	Lakebed geology	RMG	1	5
11	Ordinary High Water Elevation; Shoreland boundary	RS TAR	1	
12	Controlled or uncontrolled releases	GMD		
13	Water Levels		2	1
14	Lake level fluctuations – normal and historical	GMD		
15	Water levels on all monitored lakes (regulatory purposes)	DH		
16	100-year and 500-year flood elevation	AAB		1
17	Names of lake associations and contacts	RS		
18	Hydrology cover – differentiate between lakes and bodies of water	JW		
19	Integration of lake data - structure, quality information, fish	ML		1
20	Land use trends in shoreline and lakeshed	ML		
21	Location of uncontrolled release sites	LVS		
22	Areas affected by uncontrolled release (urban, agricultural, other waters)	LVS		
23	Residence Time	SMC		
24	Where is the public boat access and any public shoreland	MCD		
25	Access	MD		
26	Where to legally access when no public access exists	JM		
27	Navigation Information			
28	Shoreland Classification	RS		
29	Management Class (NE, GD, RD) same as above?	MD TAR	1	
30	What does the shoreline look like? Natural vs. Developed?	MCD		3
31	Need access to depth, clarity, fish management info, water quality info, etc., for all lakes (public information requests)	DH		

#	Business Information Need (I need to know)	ID	V-M	V-S
32	Need to be able to compute lake areas and amount of shoreline (for shoreland management purposes)	DH		
33	Local shoreland zoning ordinances			
34	Land ownership around lake (public or private)	JM		1
35	Public Beaches	SMC		
36	Fish Information (stocking, etc.)	RS		
37	What kind of fish are in the lake	MCD		
38	Fish Surveys	MD		
39	Lake ID #	JM		
40	Name and aliases	RS		
41	Name and/or ID#	AAB	1	2
42	Drinking water protection management classification (surface water source)	SMN		
43	Need a legal definition of “lakes” developed	DH		1
44	Shoreline protection, - riprap, seawall, retaining wall, bioengineering, unprotected, etc., by percent of coverage	JH	1	
45	Historic thin ice locations	AAB		
46	Typical ice-out date – historic dates	AAB		
47	Will this “pond” support fish? Are there fish there now?	NR		
48	Lake report card (water quality)	JH		
49	Buffering capacity – sensitivity to acidification	SMC		
50	ISTS locations	SMN	1	1
51	What kind of vegetation is on the shoreland (all features)	MCD		
52	Exotics	MD		
53	Lake Landlocked?	JW		
54	Lake and ground water interactions	SA		
55	Does this wetland drain into this lake?	NR		
56	Permitted Activities	MD		

#	Business Information Need (I need to know)	ID	V-M	V-S
57	Water quality	MD	2	2
58	Eutrophication (nutrients)	SMC		
59	Point-source discharge – quantity and quality	JR		
60	Vegetation mapping of lakes (submergent/emergent)	JW	1	
61	Name of Lake Associations and contact information	RS		

Feature: Wetlands

Feature Votes: 5 Metro; 8 State

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Wetland outline – who did it and how	CHS		
2	Ordinary High Water Elevation	SW		
3	Boundary	MD TAR	4	7
4	Size, Type, Protected Waters Status	RS TAR		
5	ID#, names, alias	LVS TAR	1	1
6	PWI#, MMCD#	NR		1
7	Size, elevation, and other characteristics	GMD		
8	Standard definition to track trends in acreage	ML		2
9	Elevation of outlet	GMD	1	
10	Wetland types – vegetation types	MJ TAR		1
11	Need to know which wetlands are classified as public waters and approximate boundaries	DH		1
12	How much time per year is wetland flooded? At surface?	LVS	1	

#	Business Information Need (I need to know)	ID	V-M	V-S
	Dry?			
13	Organic vs. Granular Soils	JR		
14	Stormwater inlets/outlets	NR		
15	What impacts (if any) on this basin?	MD		1
16	Wetland affected by ditch?	RS		
17	Need changes in wetland type monitored over time.	DH		
18	Has any part of the original wetland been changed or filled?	JM		
19	History – Was wet – now dry	LVS		
20	Protection priority rating	JH		
21	Is it affected by a public ditch?	SW		
22	State or federal ownership?			
23	What parcels overlap or are adjacent to a wetland?			
24	Riparian Ownership	JH		
25	Need location and size of drained and filled wetlands and location and size of mitigation wetlands	DH	1	
26	Need to have drained wetlands identified (for mitigation purposes)	DH		
27	USDA Status?	MD		
28	Need wetlands smaller than 1 acre identified for Wetland Conservation Act purposes	DH		
29	Exotics	MD		
30	Special habitat	LVS		
31	Uses of wetland (values and functions)	SMC		2
32	Significance of wetland in lakeshed or watershed (qualitative type)	ML		
33	What is the water quality (applies to all)	MCD		
34	Drinking water protection (management, protection)	SMN		

#	Business Information Need (I need to know)	ID	V-M	V-S
	(surface water source)			
35	Invertebrates found, who monitors?	NR		
36	Typical wildlife, waterfowl, amphibians; and who has data?	NR		
37	Exotics (purple loosestrife)	SMN		
38	CBS Quality	JR		
39	Fens?	DH		
40	Location and area covered by cattails, r.c.grass, sedge, other	NR	1	
41	How much does water depth and area of water covered change from a given storm event?	NR		
42	Legal access for hunting and fishing	JM		1
43	Urban Stormwater influence	JR		
44	Are there hunting and fishing opportunities?	MCD		
45	Farmed wetlands	JR		
46	Effect of construction in watershed on water depth, frequency of flood	NR		
47	Potential for restoration	JR	1	
48	Wetland/ ground water interaction (recharge/discharge rates)	SA		
49	Permitted activities	MD		
50	WCA Permit information?	DK		
51	WCA violations data	DK		
52	Certificate of exemption, by wetland	JH		
53	Buffer zones and width	JH		
54	Local setback or buffer requirements	SA		
55	Wetland banking credits	SMN		
56	Impact that used wetlands bank to mitigate		1	
57	Used as banking mitigation	TO		
58	Current water depth and area currently wet. (Prefer daily; weekly would help)	NR	1	

#	Business Information Need (I need to know)	ID	V-M	V-S
59	“Bounce” in water depth	NR		
60	Normal water levels	TAR		
61	Predicted 100-year flood elevations	TAR		
62	Outlet control structures and elevations	TAR		

Feature: Rivers

Feature Votes: 5 Metro; 15 State

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Channelized - Date	JR		
2	Need <u>single</u> ordering/numbering system for streams to properly catalog and file historic information	DH	3	1
3	Delineation – location - positional accuracy (definite vs. approximate) portrayal for National Mapping consistency	RW		3
4	Definition of river types (delineation?) : minor, moderate, major	GMD		2
5	Stream order	MD		2
6	Delineate(?) river lengths within watersheds	GMD		1
7	Riverbed geology	RMG		
8	Makeup of river bottom			
9	River name and aliases	RS		
10	Eroded banks	JR		1
11	Substrate	JR		
12	Location of hydraulic model cross-sections and cross-section data itself	AAB		2
13	Delineation of banks at “normal” summer flow to within 1 meter	AAB		
14	Centerline delineation and who did it	AAB		1

#	Business Information Need (I need to know)	ID	V-M	V-S
15	Ground water and river interaction	ML		
16	Need stream profile (longitudinal and cross-section)	MJ		
17	Need to be able to compute area of the beds of all watercourses	DH		
18	Need connected stream network	MJ		4
19	Need direction of flow of all watercourses	DH		
20	Need stream flow direction	MJ		
21	What does the shoreline look like – natural vs. developed	MCD		
22	Slope	CHS		1
23	Shoreline definition/delineation (River, Lake) characteristics for mapping location (i.e., water vs. land) National Consistency	RW		3
24	Need all watercourses draining over 2 square miles (public waters definition)	DH		
25	Mussel locations	AAB		
26	Fish Surveys	MD		
27	What kind of fish are in the river			
28	Buffer width and composition	JR	1	
29	Where is the public boat access and any public shoreland (river)	MCD		
30	Access	MD		
31	Exotics	MD		
32	Where are easy access points (bridges, etc.)	NR	1	
33	All structures on the river and who owns them	PLD		1
34	Bridge scour information	AAB		
35	Need dam locations	MJ		
36	Dam specifics – location, age, dimensions, ownership, etc.	SA		
37	Hazard class of dams	SW		

#	Business Information Need (I need to know)	ID	V-M	V-S
38	Lake, river, wetland: various governments involved in control	RS		
39	Permitting agencies – DNR, Corps, local	PLD		
40	Drainage or other easements	SMN		
41	County Ditch Authority? E.g., Red River Valley.	NR for group		
42	Is it a designated trout stream?	NR		1
43	Wild and Scenic River? And classification	RS		
44	Canoe Boating Route	SW		
45	Where are trends showing?	ML		
46	Analysis – what does map/data/etc mean?	ML		
47	1-foot topographic contour	AAB		1
48	River min/max flow; navigability; high/low elevations; horizontal extents	LVS		1
49	Typical channel and overbank Manning’s “N” values	AAB		
50	River levels for canoe-ability; rapids locations and classes	JM		1
51	Navigation Info. Lanes/structures			
52	Historic ice jam locations	AAB		1
53	Location of bank protection. Type and size of protection.	AAB		
54	Intermittent stream/river – approximate time of year they contain flow	DK		
55	Flow monitoring stations - location	JH		
56	Drought information; low water flow	RS		
57	Flow data	MD TAR	1	
58	Bankfull discharge	MD	1	
59	Current volume of flow (real-time). Who is collecting? How	NR		

#	Business Information Need (I need to know)	ID	V-M	V-S
	do we get it?			
60	Historic Data: flows, elevation of past flooding	PLD		
61	Distance of detectable carry for something introduced at this point.	NR		
62	Temperature data	JR		
63	Protected flow?	SW		
64	Permitted appropriation withdrawals	SW		
65	Spot elevation for OHW, from upstream to downstream	JH		
66	Location of water supply intakes	SMC		
67	Location of discharges	SMC		
68	Inlet Locations	SW		
69	Livestock Access	JR		
70	Livestock watering and irrigation appropriation	JR		
71	Water quality data	MD	1	1
72	Stream Water Quality classes (per MPCA)	MJ	1	
73	TMDL's – total maximum daily loads	MD		
74	Need position of lake and stream monitoring stations	MJ		
75	Dump sites	SW		
76	Communities without municipal wastewater treatment, by watershed	SW		
77	Locations of bridges and culverts	AAB		1
78	Flood insurance information regarding peak flows and elevations	TAR		
79	USGS information regarding peak flows for specific locations along channel; any other data available as it pertains to estimating flows for streams	TAR		

Feature: Floodplains
Feature Vote: 4 Metro; 4 State

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Elevation boundary	MD TAR		
2	10, 50, 00, and 500-year floodplain elevations and boundaries **	DH TAR	4 cl.	9 cl.
3	Delineation of various floodplains (10 yr, 25 yr,500 yr) **	GMD	x	x
4	Where are the floodplains? How large is the floodplain?	JM		1
5	Delineation of floodway and floodplain	PLD		
6	Is there a detailed FIS on this portion of floodplain?	PLD		
7	Man-made floodplains	CUB		
8	Flood Frequency – 100yr, 500yr	MJ	1	
9	100-year elevation	RS		
10	Need all FEMA mapped floodplains in all communities	DH		
11	Updated boundary. Has development affected or altered the floodplain?	JH		
12	Floodplain Unique ID. Horizontal extents	LVS		
13	The limits of the floodplain	MCD		1
14	2, 5, 10-year floodplain areas (ag flooding)	SW		
15	Flood impacts (road inundation)	GMD		1
16	Location of levees- - who built - purpose - is it certified	AAB		1
17	Distance between X-sections along centerline	AAB		1
18	Floodplains for intermittent streams (non-DNR)	JR		

#	Business Information Need (I need to know)	ID	V-M	V-S
19	2-foot topo (6 “ for Norman County)	JR	2	3
20	Related metadata guidelines	RMG		
21	Metadata	MD		
22	What is the ground cover within the floodplain – natural or developed (hard surface)			
23	Flood damage risk to property (housing) Man made built	MCD		1
24	Public Supply water wells, fire, rescue, police, hospitals, located within 500-year floodplain	SW		
25	Frozen ground flooding	JR		
26	Natural habitat condition	MCD		
27	Need boundaries of all FEMA mapped Unnumbered “A” zones	DH		1
28	What wetlands are flooded at a given river stage?	NR		
29	Local land use decisions – permits, subdivisions (applies to lakes, wetlands, rivers, floodplains)	RS		
30	Permit Activity. Map Changes (Applies to lakes, rivers, wetlands, floodplains)	RS		
31	“LMA”/“LMR” Buildings, properties	SA		
32	Flood insurance information that pertains to floodplain elevations, various cover conditions associated with floodplains	TAR		

Feature: Ditches

Feature Vote: 5 Metro; 4 State

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Where all the ditches are (accurately) **	JR	4 cl	4 cl
2	Location of ditches (ideally to within one meter) **	AAB	X	X
3	What year was ditch created?	DK	1	
4	Who created the ditch?	DK		
5	Legal name of ditch			
6	Unique ID number of ditch	LVS	2	
7	Tiles in ditch	JR		1
8	Estimated Manning's 'N' Value	AAB		
9	Existence of Interceptor Ditches? – question about whether these exist in Mn – they are built to intercept the flow of contaminated ground water and control it before discharge.	LVS		
10	Buffer strip width on ditches	JR	1	
11	Depth of ditches	JR	1	
12	Zone of influence	JR		
13	Existence of structures over the ditch (e.g., culverts, constrictions, bridges)	PLD		
14	Capacity of ditch	SMC		
15	Flow data for ditches	DK		2
16	How long is water standing in the ditch? - Flood Control Standpoint - Mosquito Control Standpoint	NR	1	
17	Ditches (public ditches?) that run through lakes and wetlands	SN, JR		
18	Slope of ditch	AAB		
19	Drainage area of ditch	JH		

#	Business Information Need (I need to know	ID	V-M	V-S
20	As-constructed profiles and cross-sections; Typical cross-section (AAB); typical cross-section with slope of ditch	PLD, AAB,	1	1
21	Flow Network information (flow direction)	JR		
22	Legal Status (Which ditches have been legally abandoned?)	MD		
23	Ownership – Public/Private	JH	1	1
24	Need to be able to identify public and private ditches on a watershed basis.	SW		
25	Maintenance History – Frequency of Maintenance ***	JH	X	
26	Maintenance History – Inspection Records ***	TO	X	
27	Maintenance History – Problem Areas ***	LVS	1 cl	
28	Historical Flow Conditions. Overflow? Complaints? ***	LVS	X	
29	Date of last repair or cleanout ***	RS	X	
30	Can it be eliminated and made natural?	MCD		
31	Riparian Property Owners	JH		
32	Trend Information	ML		
33	Biological Community within the ditch	SMC		
34	Easement width – 1f public	RA		
35	Flow Control structures – where, and who controls?	SMN GMD	3	2
36	Benefitting Areas (relates to assessments)	CUB		1
37	Benefitting rates - \$ amount	TO		
38	Vegetation Species (e.g., cattail, grass type)	NR		
39	Infiltration Rate (higher for swale – ditch assumed low)	NR for group		
40	Urban use of ditch law to drain for construction/buildings	ML		
41	Chemical concentration	SMC		

#	Business Information Need (I need to know	ID	V-M	V-S
42	Water temperature of discharge from ditch	RS		
43	The ditch location, name, main channel identified, any information flow flows that have been associated with the ditch, culvert locations, elevations and dimensions, road surface elevations at crossings, original ditch elevations and cross dimensions included on the contour information, and have profiles and cross sections available for specified locations along the ditch.	TAR		

Feature: Drainage Tiles
Feature Vote: 1 Metro; 1 State

#	Business Information Need (I need to know	ID	V-M	V-S
1	Location of tile lines (public and private)	PLD	4	4
2	Location of outlet	PLD		
3	Direction of flow in tile line	PLD		
4	Type of tile installed (e.g., clay tile, perforated tile (PVC), French drain)	DK		
5	When was drainage tile put in?	DK		
6	Construction details – when put in; materials; cross-section	LVS		
7	Size (diameter or cross-section)			
8	Receiving basin for drainage	JH		
9	Receiving water feature	JM		
10	Slope	AAB		
11	Perforated or not	AAB		
12	Public tile system – location – watershed			
13	Percent of area within sub-watersheds that are tiled	JR		
14	Tiles in hydric soils	JR		
15	When tiles alter watershed boundaries	JR		

#	Business Information Need (I need to know	ID	V-M	V-S
16	Ownership: Who owns the tile line (PLD) Properties that have been tiled (JH) Which lines are public, which are private			
17	Controls on inlets (open/close options)	NR for group		
18	Was tile line previously an open ditch system?	SA		
19	Cost vs. Benefit (Agriculture benefit; stormwater problem)	MCD		
20	Original contractor and owner	SA		
21	Connections to farm buildings and homes (water quality issue)	MJ		
22	Maintenance history of tile lines	SA		
23	Condition of tile	DH		
24	Where tiles can be broken to benefit wetlands, vegetation, and wildlife	MCD		
25	Flow rate	SMC		
26	Capacity	JM		
27	Urban tile lines (buildings & impervious)			
28	Tile location and size, depth, material, slope, installation date, inlet and outlet locations with associated elevations, any other information known about the tile line.	TAR		

Feature: Drainage Tile Inlets
Feature Votes: No Feature Votes

#	Business Information Need (I need to know	ID	V-M	V-S
1	Size of inlet structure	PLD		
2	Diameter of inlet	AAB		

#	Business Information Need (I need to know	ID	V-M	V-S
3	Elevation of inlet	AAB		
4	Locations of inlets (and how was location determined – GPS, topo map, etc.)	SA, RH		1
5	What BMP's (Best Management Practices) are being used at or around the inlet?	SA		
6	Depth of inlet	SA		
7	Maintenance History – Condition of inlet Material (CMP, RCP, etc.)	LVS		
8	Drainage Area (watershed) to inlet	MD		
9	Inlet location, type, size, and associated elevations	TAR		

Feature: Storm Sewer – Conveyances
Feature Votes: 5 Metro; 3 State

#	Business Information Need (I need to know, ,)	ID	V-M	V-S
1	Percent of hard surface within drainage area	MCD		
2	Impervious surface of area drained	SW		1
3	Watershed limits	SW	1	3
4	Settle distinction between swale and ditch	JR		
5	Who maintains?	NR		
6	Pipe size and outlet location ***	SW	6 cl	1 cl
7	Unique structure ID ***	LVS	X	X
8	Size and type of catch basin ###	SW		
9	Catch basin location ###	PLD		
10	Drainage area to catch basins ###	PLD		
11	Flow network	JR		

#	Business Information Need (I need to know , ,)	ID	V-M	V-S
12	Miscellaneous structures on system (e.g., grit chambers, weirs)	PLD		
13	Unique treatment components (e.g., stormceptors) – these are high maintenance	SMN		
14	Ownership of system	PLD		
15	Connections between below-ground sewers and above ground ditches and swales	JR		
16	Natural drainage system – infiltrate water on site as much as possible	MCD		
17	What is the slope of the pipe	PLD		
18	What is the size of the pipe	PLD		
19	Combined sewer overflows – location/size	MJ?		
20	Combined sewers - size	MJ?		
21	Type, shape, slope, size	AAB		
22	Location of inlets and outlets and their type and size	AAB		
23	Location of manholes and invert elevations of manholes	AAB		
24	Location and number, where purpose is to contain stream, spring, e.g., Lake Phalen, Trout Brook, Twin Cities	ML		
25	Storm sewers with amenity recreation potential – e.g., Phalen, Bassett Creek	ML		
26	Design/maximum flow capacity	MD		
27	Construction specification (materials types)	SA		
28	Discharge location (into other waterway?)	LVS		
29	Flow/quality data . Storm sewer monitoring of water quality (time and frequency)	RS MD		
30	Impact on receiving water quality	SMC		
31	Impact on drinking water in major cities	JM		
32	Who maintains?	NR	1	
33	Age and maintenance history	SA		

#	Business Information Need (I need to know , ,)	ID	V-M	V-S
34	Inspection history and results	LVS		
35	Water drainage from sewage treatment (public or private)	NR for group		
36	Location and size, location of inlets and outlets with associated elevations, contributing watersheds, materials.	TAR		

Feature: Storm Sewer – Treatment System

Feature Votes: No Feature Votes (*check this!*)

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Location of retention, detention facilities ##	JH	6 cl	
2	Location, size, elevation, capacity, residence time, type (settling, retention, detention) ##	LVS	X	
3	Bio-retention and infiltration capability	JR		
4	If outletting to pond – what type of pond and what size?	PLD		
5	Stormwater wetlands	JH		
6	Where is the system outletting?	PLD		1
7	Inlets	MD		
8	Water quality/ sediment removal efficiency	JR		
9	Treatment of what? – settling of sediments; chemicals	LVS		
10	Maintenance schedule	JR		
11	Ownership –maintenance responsibility	DH		
12	Elevation of water in storage maintained by inlet/outlet	NR	1	
13	Flood elevation	MD		
14	Cost related to using up valuable land for storm ponds that have minimal value (natural resource related)	MCD		

Feature: Watersheds

Feature Votes: 5 Metro; 10 State

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Boundary – scale 1:24,000 **	RH	5 cl	10 cl
2	Area **	AAB	x	x
3	What area/networks are contributing water to this wetland (want to predict bounce) **	NR	x	x
4	Identify landlocked portions of watershed and ultimate outlet location **	DH	x	x
5	How small do we go in dividing watersheds?	AAB		
6	Delineate to at least 1 square mile size, based on two-foot contours	SW		
7	Watershed order (major, minor, etc)	MJ		
8	Lakes in watershed - located - list of lakes	ML		
9	Who has watersheds delineated? Do they match? ***	NR for group	1	1
10	Source of watershed boundary delineations ***	DH		
11	Metadata for subwatershed delineations ***	SA		2
12	Sub-watersheds – legal or taxing authority	SMN		
13	Outlet locations *****	RH		1
14	Who has info on culverts, drainage structures in this watershed (for hydro models) *****	NR		
15	Does watershed boundary include effects of culverts? (scale question) *****	NR for group		
16	Seep charge area/location	LVS		

#	Business Information Need (I need to know	ID	V-M	V-S
17	Difference between watersheds and sewersheds	JR		
18	Interaction between surface and below-ground conveyance systems	JR		
19	Spring/seep – location and approximate Q	LVS		
20	Other hydrographic data (sewer pond location, gage location, etc)	MD		
21	Ownership – property parcel mapping *****	CUB	1 cl	3 cl
22	Address and phone number of managing organization *****	PLD	x	x
23	Jurisdictional/ political management hierarchy & contacts: ***** Watershed X: state → watershed district → county → township Watershed Y: state → county → city	SA	x	x
24	Public land ownership/easements *****	SW	x	x
25	Unique ID's &&&	LVS		
26	ID #'s need to use standard size (10, 81, (major),5600, &&&	ML		
27	5000 should collapse into 81; 81 to 10, as defined in state statute (DNR major and minor map) &&&	ML		
28	Do the basins have a management classification?	SMN		
29	Frequency of flow contribution (from landlocked basins)	MD		
30	Shoreland Zones?	SMN	1	1
31	Prioritization of water resources for protection	JH		
32	Procedures for changing a data set? (local-state, etc.)	NR for group		
	RELATED GIS LAYERS			
33	Endangered/protected resources (County biological survey)	MD		
34	Consistency in information/coding, etc. between	NR		

#	Business Information Need (I need to know)	ID	V-M	V-S
	jurisdictions within a watershed (e.g., feedlots, parcels, land cover)	for group		
35	Elevation/slope	DNK		
36	Land Use – include density @@	JH	5 cl	1 cl
37	Land cover, used for SCS Curve # around wetlands. Updated annually @@	NR	x	x
38	Difference between natural and political boundary @@@	DK	1	
39	City and County Boundaries @@@	JH		
40	Streams in watershed @@@@	ML		X
41	Flow connection @@@@	TO		6 cl
42	Gage location in watershed @@@@	PLD		X
43	Streamflow and water quality gage site, with data @@@@	SW		X
44	Septic system locations ###	SMC		1 cl
45	Feedlot locations ###	SMC		X
46	Other contaminant source locations ###	SMC		X
47	Watershed boundaries that have been verified other than USGS quadrangle maps	TAR		
48	Main channel depicted for outlined watershed	TAR		
49	Capability of sorting GIS information according to watershed (currently sort by totally within, intersecting or totally out of selected area); would be nice to sort information that is contained by the selected line; this sort option should be available for modified boundaries, GIS information available beyond county boundaries, land uses, within the watersheds to include areas that have been fully developed.	TAR		

Feature: Lake Watersheds

Feature Votes: No feature votes

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Boundary **	TO	2 cl	3 cl
2	Boundaries of particular lake drainage areas **	ML	X	X
3	Lake watershed boundary – Scale 1:24,000 **	RH	X	X
4	Federal conservation easements location	SW		
5	Pedigree of watershed delineation	DNK		
6	Flow connection	TO		
7	Lakeshed modification due to storm sewers	MC		
8	Septic system location, conformance, and date of installation	DNK		
9	Feedlot locations	DNK		
10	Other contaminant source locations	SMC		
11	Lakeshed water balance (precipitation vs. withdrawals)	SA		
12	Location of restored wetlands	SW		1
	RELATED GIS LAYERS			
13	Soils	CUB		
14	Zoning	MD		
15	Elevation and slope	ML		
16	Slope (steepness)	RMG		
17	Land Use/cover	MD		
18	Hard surface/ natural surface/ vegetation type	MCD		
19	Permeability of surface and subsurface	RMG		
20	2-foot contour mapping	DH		
21	Lake watershed local action – land use activities – development permits	RS		

#	Business Information Need (I need to know)	ID	V-M	V-S
22	Habitat quality within watershed	MCD		
23	Watershed boundaries that have been verified other than USGS quadrangle maps	TAR		
24	Main channel depicted for outlined watershed	TAR		
25	Capability of sorting GIS information according to watershed (currently sort by totally within, intersecting or totally out of selected area); would be nice to sort information that is contained by the selected line; this sort option should be available for modified boundaries, GIS information available beyond county boundaries, land uses, within the watersheds to include areas that have been fully developed.	TAR		

Feature: Meteorological Information

Feature Votes: 2 Metro; 4 State

#	Business Information Need (I need to know)	ID	V-M	V-S
1	All precipitation data for each station (daily, hourly, anything available) ***	DH	5 cl	7 cl
2	Rainfall and snow trends at locations ***	ML	X	X
3	Retrieve precipitation and evaporation data by watershed ***	SW	X	X
4	Rainfall rate (inches/hr) in each square mile in metro ***	NR	X	X
5	Average precipitation per month ***	RH	X	X
6	Dates of storms over a given amount (i.e., 3 inches in 24 hours) ***	SW	X	X
	NOTE: Difference between real-time and historical data			
7	Detailed information on spatial rainfall variability ###	JR		
8	Storm hydrographs for record events ###	PLD		

#	Business Information Need (I need to know	ID	V-M	V-S
9	Average wind velocities - max, min, average temps/month &&	RH		1
10	Wind speed &&	CUB		
11	Hourly wind direction and speed from more than just MSP airport in metro (for historical analysis) &&	NR		
12	Spatial summary of (seasonal) wind frequency and intensity (interest – lake turnover) &&	JW		2
13	Locations of meteorological data stations	MD	1	
14	Location of volunteer precipitation monitoring “stations”	SA	1	
15	Daily evap metro (prefer real-time) #####	NR		
16	Evapo-transpiration rates by day #####	DH		
17	Shallow path evaporation rates for each area of state #####	DH		
18	Snow depth reports with trail conditions &&	JM		
19	Depth of snow cover by date &&	DH		1
20	Snowpack &&	RH		
21	Information on frozen ground snowmelt events &&	JR		
22	Soil temperature in spring (daily, prefer real-time) &&	NR		
23	Ice-on (JM) and Ice-out (DH) dates for lakes	JM, DH		
24	Ice thickness	JM		
25	Soil Moisture Data	MD		
26	Frequency of severe weather (hail, tornado, etc)	AAB		
27	Storm Paths (and dates); high winds	SMN		
28	Link the GIS to internet sites containing data	PLD		1
29	Air temperature	TO		
30	Stream and lake water temperature	DH		
31	Sunrise and sunset tables	JM		
32	Relationship of meteorological data to landlocked lakes	RS		

#	Business Information Need (I need to know)	ID	V-M	V-S
33	Relationship between rainfall and streamflow	SMC		
34	Pollution content of precipitation	DK		1
35	Analysis of climate effects on water supplies	ML		
36	How weather affects fish movement	JM		
37	How precipitation affects individual lakes and rivers to affect river levels for boating. Land type – rocky vs. sandy	MCD		

Feature: Sewage Treatment Ponds
Feature Votes: No Feature Votes

#	Business Information Need (I need to know)	ID	V-M	V-S
1	Location – scale 1:24,000	RH		
2	The number and location for trends	ML		
3	Location, size, etc. of abandoned ponds (and how abandoned)	SA		
4	Type of treatment system	AAB		
5	Cluster septic systems	MD		
6	On-site sewage systems: location, age, status (except septic systems)	DH		
7	Ownership (who maintains)	DH		
8	Year built	TO		
9	Number of homes served	JR		
10	Outlets	CHS		
11	Outlet – size, type of receiving water	MJ		
12	Inlets?	DK		
13	Air quality	MCD		
14	System quality? Sewage pond is related to a system	MCD		

#	Business Information Need (I need to know)	ID	V-M	V-S
15	Package treatment plants: numbers, issued permits, location	RS		
16	Is land served by system or onsite septic?	MC		
17	Sewer network (location, size, profile)	MJ		
18	Geology of pond and of surrounding area	RMG	1	
19	PCA Permit status ***	DH		1 cl
20	Permit Limits (phosphorus, suspended solids, etc.) ***	MJ		X
21	History of emergency discharges authorized by MPCA ***	SW		X
22	Volume (capacity) ***	RO		X
23	Location and water quality or management of sewage treatment ponds (how long water stays, movement or flow) ***	NR		X
24	Time of discharge into receiving water ***	RS		X
25	Frequency of emptying ***	JR		X
26	Method of emptying ***	JR		X
27	Where does it discharge into storm sewer or other bodies of water? (Both planned and unplanned discharge) ***	LVS		X
28	Possible hazardous materials	SMN		
29	Elevation of berm that encloses pond ###	PLD		
30	Is there tile around the perimeter? ###	AAB		
31	Type of liner ###	AAB		
32	Leaking? How much? ###	SMC		
33	Feedlot locations affecting rivers, streams, and lakes	JM		
34	TMDL's (total maximum daily limits)	MD		
35	Animal waste storage facilities	MD		
36	Animal waste watershed	LVS		

Feature: Wells

Feature Votes: 2 Metro; 2 State

#	Business Information Need (I need to know)	ID	V-M	V-S
1	ID #	LVS		
2	More accurate locations of wells (in general) ***	MJ	2	4
3	How location was recorded (CHS, Datum, TRS, GPS, Map, lat/long, UTM, . . . ***	TO		
4	Where are the public wells? ***	SMN	1	2
5	Location of drainage wells	SW		
6	Location of monitoring wells and who has data (shallow and deep)	NR		
7	Observation wells – location, depth, etc.	SW		
8	Location of agricultural use wells	SA	1	
9	Industrial processing/cooling wells	SW		
10	Dewatering wells, pits, and ponds – some are temporary, some are permanent	SW		
11	ATTRIBUTES/PROPERTIES			
12	Location and attributes of wells for national mapping program. Location: positional accuracy; attributes – type (water, gas)	RW		2
13	Minnesota Department of Health well log information	RS	2	1
14	Purpose well constructed	SMC		
15	Well type: irrigation, domestic, public, injection,	RS, MJ		
16	Well Depth	SMC		
17	Current water use	JR		
18	How deep are public wells? How much do they pump?	SMN		
19	Withdrawal rates of public, municipal wells	SA		
20	Location of abandoned wells	SA		

#	Business Information Need (I need to know	ID	V-M	V-S
21	Wellhead x,y,z Type Screened interval Aquifer(s) Construction details Well pipe material Screen location Purpose (piezo, monitor, public) Total depth Location Aquifer GW Level Screened interval – i.e., depth below ground surface water can enter into a well	LVS		
22	Construction date	RH		
23	Well permit information	DK		
24	Well information to determine their future cost to maintain or seal (purpose for which well data is needed)	MCD		
	SOURCE OF WATER			
25	Aquifer well draws from	RMG	1	
26	Which aquifers are private wells drawing from?	SA		1
25	Location of multi-aquifer wells: - ownership, aquifer, use	DH		
	QUALITY OF WELL WATER			
26	Quality of well water	JM		4
27	Contaminants	LVS		
28	Chemical and nuclear composition of each water well	DH		
29	Static water level elevation and surface elevation at well location	RMG	1	

#	Business Information Need (I need to know)	ID	V-M	V-S
30	Historical water levels	LVS		
31	Trend data – water quality, nitrate, etc.	ML		
32	Analysis of well information – e.g., significance of info in County Well Index	ML		
33	Interpretation of what map is showing	ML		
34	Active and abandoned piezometers (water level monitoring)	SA		
35	Abandoned well – capped or not?	GMD		
	CONTEXT			
36	Wellhead Protection Area	SMC		
37	Public well service area (where are the customers?)	SMN		
38	Political jurisdictions	SMN		
39	Well/dewatering zone of influence or cone of depression	JR		
40	Wells’ effect on surface water (levels, quality) recreation value	MCD		
41	Well information by watershed	SW		
42	Well location, casing type, depth, status (used for human consumption, livestock, abandoned, etc), elevations	TAR		

Feature: Springs

Feature Votes: No Feature Votes

#	Business Information Need (I need to know)	ID	V-M	V-S
	LOCATION			
1	Location and attributes for national mapping program Location: definite/indefinite Attributes: surface/subsurface water characteristics	RW		3
2	Where springs come to the surface (starting point)	JM		

#	Business Information Need (I need to know)	ID	V-M	V-S
	FLOW CONNECTIONS			
3	Spring-fed lakes ##	SW	1 cl	3 cl
4	How many springs feed into specific lakes ##	JM	X	X
5	Number of springs into a waterbody ##	RS	X	X
6	Hydrologic connections	SMC		
7	Discharge rates	RH		
8	Surficial extent. Flow in or out of subset of wetland	LVS		
9	Flowing wells	SW		
10	Location of Fens (Protection by state required under Wetlands Conservation Act)	DH	1	
11	Seeps	JH		
	CONTEXT			
12	Source aquifer spring flows from	JH		
13	Origin of water that is flowing out of spring	RMG		
14	Geologic conditions related to springs	SA		
15	Sinkhole locations	JR		
16	Vegetation community associated with spring			
	QUALITY			
17	Water quality and chemical composition of spring water	DH		
18	Contaminants?	RH		
	USE			
19	What spring is being used for, and by whom?	DH		
20	Is it being used for drinking water?	JH		

Feature: Ground Water
Feature Votes: 1 Metro; 4 State

#	Business Information Need (I need to know	ID	V-M	V-S
	SIZE/DEPTH/LOCATION			
1	Aquifer depth below ground surface; total depth; depth to top of aquifer; depth to bottom of aquifer	SMC		2
2	How deep is the water table?	SMN	2	1
3	Potentiometric Surface elevation	RMG		1
4	Historical water level	LVS		1
	ATTRIBUTES/PROPERTIES			
5	Associated geology – fractures, etc.	JH	2	1
6	Aquifer material properties (porosity, chemical make-up, etc.)	LVS		
7	Sinkhole locations	JR		
8	Age of ground water	SMC		
	MOVEMENT			
9	Delineate recharge area	SW	2 ??	2 ??
10	Recharge and discharge zones / basins	JH, PLD		
11	Recharge rates (locally) of aquifers	SA	1	
12	Trends in changes of amount and quality of water in aquifers	ML		2
13	Flow direction and potential yield	RMG		
14	Map known in-lake discharges and quantify	JW	2 ??	2 ??
15	Two-way flow to/from lakes & streams	SMC		
16	Direction and speed of movement	SMC		
17	Is this wetland fed by ground water? Is this wetland feeding ground water? (Discharge/recharge) Weekly or monthly data	NR		

#	Business Information Need (I need to know) USE	ID	V-M	V-S
18	Annual water use by aquifer	SW		2
19	How the ground water affects the surface water level (recreation, fish habitat)	MCD		
	QUALITY			
20	Aquifer quality/ recharge area/ piezometric level/confined?	LVS		3
21	Location of contamination sites (underground tanks)	TO		
22	Location of landfill sites	SW		
23	Sensitivity to pollution (more detailed than Atlas)	JR		
24	Aquifer information by watershed	SW		
25	Name of aquifers, depth of aquifers, confining layers, elevations	TAR		

Summary of Prioritized User Information Needs - MetroGIS and Statewide

MetroGIS Voting Summary Table – User Data Needs

This list includes all information needs that received four or more votes from participants representing MetroGIS interests. (Not in ranked order)

Feature (Original #)	Business Information Need (I need to know ,)	ID	V-M
Wetlands 3	Boundary	MD TAR	4
Floodplains 2	10, 50, 00, and 500-year floodplain elevations and boundaries **	DH TAR	4 cl.
Floodplains 3	Delineation of various floodplains (10 yr, 25 yr,500 yr) **	GMD	X
Ditches 1	Where all the ditches are (accurately) **	JR	4 cl
Ditches 2	Location of ditches (ideally to within one meter) **	AAB	X
Drainage Tiles 1	Location of tile lines (public and private)	PLD	4
Storm Sewer - Conveyances 6	Pipe size and outlet location ***	SW	6 cl
Storm Sewer - Conveyances 7	Unique structure ID ***	LVS	X
Storm Sewer - Treatment Systems 1	Location of retention, detention facilities ##	JH	6 cl
Storm Sewer - Treatment Systems 1	Location, size, elevation, capacity, residence time, type (settling, retention, detention) ##	LVS	X
Watersheds 1	Boundary – scale 1:24,000 **	RH	5 cl
Watersheds 2	Area **	AAB	x
Watersheds 3	What area/networks are contributing water to this wetland (want to predict bounce) **	NR	x
Watersheds 4	Identify landlocked portions of watershed and ultimate outlet location **	DH	x
Watersheds 36	Land Use – include density @@	JH	5 cl
Watersheds 37	Land cover, used for SCS Curve # around wetlands. Updated annually @@	NR	x

Feature (Original #)	Business Information Need (I need to know,)	ID	V-M
Meteorological 1	All precipitation data for each station (daily, hourly, anything available) ***	DH	5 cl
Meteorological 2	Rainfall and snow trends at locations ***	ML	X
Meteorological 3	Retrieve precipitation and evaporation data by watershed ***	SW	X
Meteorological 4	Rainfall rate (inches/hr) in each square mile in metro ***	NR	X
Meteorological 5	Average precipitation per month ***	RH	X
Meteorological 6	Dates of storms over a given amount (i.e., 3 inches in 24 hours) ***	SW	X

This list includes all information needs that received 1-3 votes from participants representing MetroGIS interests. (Not in ranked order)

Feature (Original #)	Business Information Need (I need to know,)	ID	V-M
Lakes 1	Lake bathymetry (depth contours)	JW MJ	2
Lakes 10	Lakebed geology	RMG	1
Lakes 11	Ordinary High Water Elevation; Shoreland boundary	RS TAR	1
Lakes 13	Water Levels		2
Lakes 29	Management Class (NE, GD, RD) same as above?	MD TAR	1
Lakes 41	Name and/or ID#	AAB	1
Lakes 44	Shoreline protection, - riprap, seawall, retaining wall, bioengineering, unprotected, etc., by percent of coverage	JH	1
Lakes 50	ISTS locations	SMN	1
Lakes 57	Water quality	MD	2
Lakes 60	Vegetation mapping of lakes (submergent/emergent)	JW	1

Feature (Original #)	Business Information Need (I need to know)	ID	V-M
Wetlands 5	ID#, names, alias	LVS TAR	1
Wetlands 9	Elevation of outlet	GMD	1
Wetlands 12	How much time per year is wetland flooded? At surface? Dry?	LVS	1
Wetlands 25	Need location and size of drained and filled wetlands and location and size of mitigation wetlands	DH	1
Wetlands 40	Location and area covered by cattails, r.c.grass, sedge, other	NR	1
Wetlands 47	Potential for restoration	JR	1
Wetlands 56	Impact that used wetlands bank to mitigate		1
Wetlands 58	Current water depth and area currently wet. (Prefer daily; weekly would help)	NR	1
Rivers 2	Need <u>single</u> ordering/numbering system for streams to properly catalog and file historic information	DH	3
Rivers 28	Buffer width and composition	JR	1
Rivers 32	Where are easy access points (bridges, etc.)	NR	1
Rivers 57	Flow data	MD TAR	1
Rivers 58	Bankfull discharge	MD	1
Rivers 71	Water quality data	MD	1
Rivers 72	Stream Water Quality classes (per MPCA)	MJ	1
Floodplains 8	Flood Frequency – 100yr, 500yr	MJ	1
Floodplains 19	2-foot topo (6 “ for Norman County)	JR	2
Ditches 3	What year was ditch created?	DK	1
Ditches 6	Unique ID number of ditch	LVS	2
Ditches 10	Buffer strip width on ditches	JR	1
Ditches 11	Depth of ditches	JR	1

Feature (Original #)	Business Information Need (I need to know)	ID	V-M
Ditches 16	How long is water standing in the ditch? - Flood Control Standpoint - Mosquito Control Standpoint	NR	1
Ditches 20	As-constructed profiles and cross-sections; Typical cross-section (AAB); typical cross-section with slope of ditch	PLD, AAB,	1
Ditches 23	Ownership – Public/Private	JH	1
Ditches 25	Maintenance History – Frequency of Maintenance ***	JH	X
Ditches 26	Maintenance History – Inspection Records ***	TO	X
Ditches 27	Maintenance History – Problem Areas ***	LVS	1 cl
Ditches 28	Historical Flow Conditions. Overflow? Complaints? ***	LVS	X
Ditches 29	Date of last repair or cleanout ***	RS	X
Ditches 35	Flow Control structures – where, and who controls?	SMN GMD	3
Storm Sewer - Conveyances 3	Watershed limits	SW	1
Storm Sewer - Conveyances 32	Who maintains?	NR	1
Storm Sewer - Treatment System 12	Elevation of water in storage maintained by inlet/outlet	NR	1
Watershed 9	Who has watersheds delineated? Do they match? ***	NR for group	1
Watershed 21	Ownership – property parcel mapping *****	CUB	1 cl
Watershed 22	Address and phone number of managing organization *****	PLD	x

Feature (Original #)	Business Information Need (I need to know)	ID	V-M
Watershed 23	Jurisdictional/ political management hierarchy & contacts: ***** Watershed X: state → watershed district → county → township Watershed Y: state → county → city	SA	x
Watershed 24	Public land ownership/easements *****	SW	x
Watershed 30	Shoreland Zones?	SMN	1
Watershed 38	Difference between natural and political boundary @@@	DK	1
Lake Watershed 1	Boundary **	TO	2 cl
Lake Watershed 2	Boundaries of particular lake drainage areas **	ML	X
Lake Watershed 3	Lake watershed boundary – Scale 1:24,000 **	RH	X
Meteorological 13	Locations of meteorological data stations	MD	1
Meteorological 14	Location of volunteer precipitation monitoring “stations”	SA	1
Sewage Treatment Ponds 18	Geology of pond and of surrounding area	RMG	1
Wells 2	More accurate locations of wells (in general) ***	MJ	2
Wells 4	Where are the public wells? ***	SMN	1
Wells 8	Location of agricultural use wells	SA	1
Wells 13	Minnesota Department of Health well log information	RS	2
Wells 25	Aquifer well draws from	RMG	1
Wells 29	Static water level elevation and surface elevation at well location	RMG	1
Springs 3	Spring-fed lakes ##	SW	1 cl
Springs 4	How many springs feed into specific lakes ##	JM	X
Springs 5	Number of springs into a waterbody ##	RS	X
Springs 10	Location of Fens (Protection by state required under Wetlands Conservation Act)	DH	1

Feature (Original #)	Business Information Need (I need to know)	ID	V-M
Ground Water 2	How deep is the water table?	SMN	2
Ground Water 5	Associated geology – fractures, etc.	JH	2
Ground Water 9	Delineate recharge area	SW	2 ??
Ground Water 11	Recharge rates (locally) of aquifers	SA	1
Ground Water 14	Map known in-lake discharges and quantify	JW	2 ??

Statewide Voting Summary Table – User Data Needs

This list includes all information needs that received four or more votes from participants representing statewide or none-metropolitan interests. (Not in ranked order)

#	Business Information Need (I need to know)	ID	V-S
1	Lake bathymetry (depth contours)	Lake # 1	7
2	Lakebed geology	Lake # 10	5
3	Wetland Boundary	Wetland # 3	7
4	Need connected stream network	River # 18	4
5	10, 50, 100, and 500-year floodplain elevations and boundaries **	Floodplain # 2, 3	9
6	Accurate locations of ditches	Ditch # 1,2	4
7	Location of tile lines, public and private	Drainage Tiles #1	4
8	Watershed boundaries	Watershed #1	10
9	Streams in watershed, flow connections, gage locations, associated flow and water quality data	Watershed # 40-43	6
10	Precipitation data from all stations, including daily, hourly, annual averages, rates, info. From significant storms, data averaged over a watershed. (real-time and historical)	Meteorological # 1-6	7
11	More accurate location of wells	Wells #2	4
12	Quality of well water	Wells #26	4

These information needs received 1-3 votes from participants representing statewide or non-metro interests. (Not in ranked order)

#	Business Information Need (I need to know)	ID	V-S
Lake 30	What does the shoreline look like? Natural vs. Developed?	MCD	3
Lake 41	Name and/or ID#	AAB	2
Lake 57	Water quality	MD	2
Lake 5	Location and elevation of controlled discharges. Where do controlled releases go?	LVS TAR	1
Lake 13	Water Levels		1
Lake 16	100-year and 500-year flood elevation	AAB	1
Lake 19	Integration of lake data - structure, quality information, fish	ML	1
Lake 34	Land ownership around lake (public or private)	JM	1
Lake 43	Need a legal definition of “lakes” developed	DH	1
Lake 50	ISTS locations	SMN	1
Wetland 8	Standard definition to track trends in acreage	ML	2
Wetland 31	Uses of wetland (values and functions)	SMC	2
Wetland 5	ID#, names, alias	LVS TAR	1
Wetland 6	PWI#, MMCD#	NR	1
Wetland 10	Wetland types – vegetation types	MJ TAR	1
Wetland 11	Need to know which wetlands are classified as public waters and approximate boundaries	DH	1
Wetland 15	What impacts (if any) on this basin?	MD	1
Wetland 42	Legal access for hunting and fishing	JM	1
Rivers 18	Need connected stream network	MJ	4
Rivers 3	Delineation – location - positional accuracy (definite vs. approximate) portrayal for National Mapping consistency	RW	3

#	Business Information Need (I need to know)	ID	V-S
Rivers 23	Shoreline definition/delineation (River, Lake) characteristics for mapping location (i.e., water vs. land) National Consistency	RW	3
Rivers 4	Definition of river types (delineation?) : minor, moderate, major	GMD	2
Rivers 5	Stream order	MD	2
Rivers 12	Location of hydraulic model cross-sections and cross-section data itself	AAB	2
Rivers 2	Need <u>single</u> ordering/numbering system for streams to properly catalog and file historic information	DH	1
Rivers 6	Delineate(?) river lengths within watersheds	GMD	1
Rivers 10	Eroded banks	JR	1
Rivers 14	Centerline delineation and who did it	AAB	1
Rivers 22	Slope	CHS	1
Rivers 33	All structures on the river and who owns them	PLD	1
Rivers 42	Is it a designated trout stream?	NR	1
Rivers 47	1-foot topographic contour	AAB	1
Rivers 48	River min/max flow; navigability; high/low elevations; horizontal extents	LVS	1
Rivers 50	River levels for canoe-ability; rapids locations and classes	JM	1
Rivers 52	Historic ice jam locations	AAB	1
Rivers 71	Water quality data	MD	1
Rivers 77	Locations of bridges and culverts	AAB	1
Floodplain 19	2-foot topo (6 “ for Norman County)	JR	3
Floodplain 4	Where are the floodplains? How large is the floodplain?	JM	1
Floodplain 13	The limits of the floodplain	MCD	1
Floodplain 15	Flood impacts (road inundation)	GMD	1
Floodplain 16	Location of levees- - who built	AAB	1

#	Business Information Need (I need to know	ID	V-S
	- purpose - is it certified		
Floodplain 17	Distance between X-sections along centerline	AAB	1
Floodplain 23	Flood damage risk to property (housing) Man made built	MCD	1
Floodplain 27	Need boundaries of all FEMA mapped Unnumbered "A" zones	DH	1
Ditch 15	Flow data for ditches	DK	2
Ditch 35	Flow Control structures – where, and who controls?	SMN GMD	2
Ditch 7	Tiles in ditch	JR	1
Ditch 20	As-constructed profiles and cross-sections; Typical cross-section (AAB); typical cross-section with slope of ditch	PLD, AAB,	1
Ditch 23	Ownership – Public/Private	JH	1
Ditch 36	Benefitting Areas (relates to assessments)	CUB	1
Storm Sewer 2	Impervious surface of area drained	SW	1
Storm Sewer 3	Watershed limits	SW	3
Storm Sewer 6	Pipe size and outlet location ***	SW	1 cl.
Storm Sewer 7	Unique structure ID ****	LVS	X
Storm – Treatment 6	Where is the system outletting?	PLD	1
Watershed 40 cl3	Streams in watershed @@@@	ML	X
Watershed 41 cl3	Flow connection @@@@	TO	6
Watershed 42 cl3	Gage location in watershed @@@@	PLD	X
Watershed 43 cl3	Streamflow and water quality gage site, with data @@@@	SW	X
Watershed 21 cl	Ownership – property parcel mapping *****	CUB	3

#	Business Information Need (I need to know	ID	V-S
Watershed 22 c1	Address and phone number of managing organization *****	PLD	X
Watershed 23 c1	Jurisdictional/ political management hierarchy & contacts: Watershed X: state → watershed district → county → township Watershed Y: state → county → city	SA	X
Watershed 24 c1	Public land ownership/easements *****	SW	X
Watershed 11	Metadata for subwatershed delineations ***	SA	2
Watershed 9	Who has watersheds delineated? Do they match? ***	NR for group	1
Watershed 13	Outlet locations *****	RH	1
Watershed 30	Shoreland Zones?	SMN	1
Watershed 36 c12	Land Use – include density @@	JH	1
Watershed 37 c12	Land cover, used for SCS Curve # around wetlands. Updated annually @@	NR	X
Watershed 44 c14	Septic system locations ###	SMC	1
Watershed 45 c14	Feedlot locations ###	SMC	X
Watershed 46 c14	Other contaminant source locations ###	SMC	X
Lake Watershed 1 c1	Boundary **	TO	3
Lake Watershed 2 c1	Boundaries of particular lake drainage areas **	ML	X
Lake Watershed 3 c1	Lake watershed boundary – Scale 1:24,000 **	RH	X
Lake Watershed 12	Location of restored wetlands	SW	1
Meteorology 1	All precipitation data for each station (daily, hourly,	DH	7 c1

#	Business Information Need (I need to know	ID	V-S
	anything available) ***		
Meteorology 2	Rainfall and snow trends at locations ***	ML	X
Meteorology 3	Retrieve precipitation and evaporation data by watershed ***	SW	X
Meteorology 4	Rainfall rate (inches/hr) in each square mile in metro ***	NR	X
Meteorology 5	Average precipitation per month ***	RH	X
Meteorology 6	Dates of storms over a given amount (i.e., 3 inches in 24 hours) ***	SW	X
	NOTE: Difference between real-time and historical data		
Meteorology 12	Spatial summary of (seasonal) wind frequency and intensity (interest – lake turnover) &&	JW	2
Meteorology 9	Average wind velocities - max, min, average temps/month &&	RH	1
Meteorology 19	Depth of snow cover by date &&	DH	1
Meteorology 28	Link the GIS to internet sites containing data	PLD	1
Meteorology 34	Pollution content of precipitation	DK	1
Treatment Ponds 19	PCA Permit status ***	DH	1 cl
Treatment Ponds 20	Permit Limits (phosphorus, suspended solids, etc.) ***	MJ	X
Treatment Ponds 21	History of emergency discharges authorized by MPCA ***	SW	X
Treatment Ponds 22	Volume (capacity) ***	RO	X
Treatment Ponds 23	Location and water quality or management of sewage treatment ponds (how long water stays, movement or flow) ***	NR	X
Treatment Ponds 24	Time of discharge into receiving water ***	RS	X
Treatment Ponds 25	Frequency of emptying ***	JR	X

#	Business Information Need (I need to know	ID	V-S
Treatment ponds 26	Method of emptying ***	JR	X
Treatment Ponds 27	Where does it discharge into storm sewer or other bodies of water? (Both planned and unplanned discharge) ***	LVS	X
Wells 4	Where are the public wells? ***	SMN	2
Wells 12	Location and attributes of wells for national mapping program. Location: positional accuracy; attributes – type (water, gas)	RW	2
Wells 13	Minnesota Department of Health well log information	RS	1
Wells 26	Which aquifers are private wells drawing from?	SA	1
Springs 1	Location and attributes for national mapping program Location: definite/indefinite Attributes: surface/subsurface water characteristics	RW	3
Springs 3	Spring-fed lakes ##	SW	3 cl
Springs 4	How many springs feed into specific lakes ##	JM	X
Springs 5	Number of springs into a waterbody ##	RS	X
Ground Water 20	Aquifer quality/ recharge area/ piezometric level/confined?	LVS	3
Ground Water 1	Aquifer depth below ground surface; total depth; depth to top of aquifer; depth to bottom of aquifer	SMC	2
Ground Water 18	Annual water use by aquifer	SW	2
Ground Water 12	Trends in changes of amount and quality of water in aquifers	ML	2
Ground Water 9	Delineate recharge area	SW	2 ??
Ground Water 14	Map known in-lake discharges and quantify	JW	2 ??
Ground Water 2	How deep is the water table?	SMN	1
Ground Water 3	Potentiometric Surface elevation	RMG	1
Ground Water 4	Historical water level	LVS	1

#	Business Information Need (I need to know)	ID	V-S
Ground Water 5	Associated geology – fractures, etc.	JH	1

Summary of Identified Priority Hydrographic Feature Types

Feature Type	Metrowide	Statewide	Total
Lakes	5	13	18
Wetlands	5	8	13
Rivers	5	15	20
Floodplains	4	4	8
Ditches	5	4	9
Drainage Tiles	1	1	2
Drainage Tile Inlets	0	0	0
Storm Sewer - Conveyance	5	3	8
Storm Sewer - Treatment	0	0	0
Watersheds	5	10	15
Lake Watersheds	0	0	0
Meteorological	2	4	6
Sewage Treatment Ponds	0	0	0
Wells	2	2	4
Springs	0	0	0
Ground Water	1	4	5

* Votes by participants for Highest Priority Feature Types

Desired Specifications for Hydrographic Feature Types

Four top features were selected based upon participants voting for their highest priority feature. Each participant was given four votes. The voting results are summarized on the previous page in the summary table. From the list of 17 features, lakes, wetlands, watersheds and rivers were nominated as the highest priority features. Each one of the four discussion groups were assigned one feature and given 30 minutes per feature to identify data specifications for each feature. The following is a list of the features and their data specifications.

Feature: Lakes

#	Data Specifications	ID
1	Test/compare/match lake boundaries against lake boundaries on digital orthophotos	NR DK
2	4-meter, statewide accuracy (horizontal)	NR & all
3	NAD83, UTM Zone 15 Extended (as data sharing standards)	All
4	PWI#	TO
5	PWI Maps	DK
6	Link to watershed, contributing land (lakeshed) to get # of acres that contribute	CUB
7	Lake name	NR
8	Procedures & responsibilities to update once established	NR
9	Who did the delineation? When? What process was used?	AAB, SMC
10	Shoreland zoning and description of land uses of shore	TO
11	Use DRG's to capture lakes and contours (bathymetry and structure)	RW
12	Inlets and outlets	CUB
13	Match DOQ lake boundary with recorded lake level for that date	NR
14	Secchi depth, water quality report card and trophic status	RH
15	Lake and lakebed geology characteristics	RH
16	Historic and computed 100-year and 500-year lake levels (10-year data, too)	AAB

#	Data Specifications	ID
17	Exotics – all types (fish, plants – milfoil, loosestrife)	CUB
18	Clear/Clarify procedures to assign ID numbers to basins without ID's	NR
19	Recreational classifications – water depth and clarity for diving	JM
20	Temperature – seasonal, etc.	DNK
21	Political, local government unit boundaries	RS
22	Identify circulation systems within the lake (e.g., aeration systems for ice-out)	MJ
23	Weed roller control systems	GR
24	Location of monitoring and sampling stations – on shoreline and in lake	MJ
25	Percent littoral zone (in % of lake area)	SMN
26	Historical levels of lakes	SMN
27	ID zones of a lake's seepage and discharge into the lake	MJ
28	Tie information to local government's parcel ID system(s) – to include permits processed, wells, irrigation, etc.	RS, SW
29	Emergent vegetation stands by species, extent	SW
30	Governor's Council to resolve sub-basin numbering procedures and responsibilities. Reconcile on complete basin numbering process &#	DH, SW
31	Gage locations	SW
32	(Current) lake levels and OHW data, plus benchmarks (from lakes database)	DH, SW
33	PCA LAP – Clean Water Partnership Studies (information resource)	RS
34	Bluff areas and onshore slopes	SW, RS
35	Characteristics of land use within the contributing watershed	ML
36	Shoreland classification for development (natural environment, general development, recreational development)	DNK
37	Surface water use, zoning, and restrictions	JM

#	Data Specifications	ID
38	Miles of shoreline	JH
39	Type of control structure, if any, with elevation data (related to discharges (data) from a control structure)	JH, GM
40	Tie-in/link with Tourism's database on recreational facilities	JM
41	Floodplain elevations – 100-year, for example	JH
42	Lakeshore property values and taxes; numbers of residential (seasonal, permanent) and non-residential structures	SMC, SW
43	Condition of the shoreline (natural, riprap, engineered)	JH
44	Standardize definition of “shoreline”	RW
45	Bathymetry/ depth contour information	RW
46	Fish population, ecology, types and changes, with links to stocking reports	ML
47	Recreation classification (MPCA) is it swimmable?	JH
48	Are there fish consumption advisories? (size, species, contaminant?)	SMC
49	Public Access (Number and type)	ML
50	Basins integrated with stream network; connectivity must be integrated; network model must take into account all hydrographic features	RW

Feature: Wetlands

#	Data Specifications	ID
1	For stormwater management, all wetlands down to pocket size	MJ
2	National Wetlands Inventory Limitations in the early 1980's – 1 acre minimum size	All
3	400 square feet for Wetlands Conservation Act (WCA) permitting	DH
4	"de minimis"– for WCA – changes based on where you are in the state – 400 square feet to 5000 square feet	All
5	DNR Protected Waters Status (is it protected?)	SMN

#	Data Specifications	ID
6	Ordinary High Water Level? DNR uses NWI boundaries and field checking in place of OHW – in 50% of cases, NWI is right on	DH, JR
7	If there is a community or wetland inventory it could be good to have it automated. Note – this is an inventory, not necessarily a delineation	SMN
8	In state file, note existence of higher-resolution data and functional value assessment	JR
9	Drained wetlands, Bulletin 25, Hydric soils, NRCS Slide review	SW DK CUB
10	Spatial accuracy – plus or minus 10 feet	NR
11	Spatial accuracy – match DOQ (1997 metro DOQs in metro area), 1991 Basemaps data outstate	DK
12	NWI v. Circular 39 classification – actual polygons	NR SW
13	Trends –are we gaining or losing wetlands? Revisit over time; not real small ones; every 5-10 years is adequate; NRI is adequate; data is timely	ML
14	Break out by available banking credits (mitigated/restored wetlands) tied to watershed and county area, agency	LVS
15	Numbering could help in some areas but with the number of wetlands could be unwieldy	JH
16	Attach soil type information	JH
17	Ability to sort by habitat, evaluate for wildlife, recreation	ML
18	Allowable "de minimis" – how much has been filled; how much can be filled	JH
19	Updates? 5-year desirable; 10-year may be doable	DH
20	Track wetland fill and mitigation areas	JR
21	Get rid of the wetland points – at higher resolution they all become polygons	JR
22	Related coverages: potential legal access, ownership (public and private); actual ownership of parcels	JH

#	Data Specifications	ID
23	<p>Good database of surveyed OHWL (DNR)</p> <p>(Jurisdictional boundary – better on lakes than wetlands)</p> <p>Statewide there are 1000 OHWL's - stored as elevation on database – not a boundary file. People need better access to this information. High water mark leaves permanent level on the landscape</p>	SW
24	MMCD – needs roadside ditches, tire tracks, large tires, 0.01 acre minimum size	NR JH
25	Hennepin County is doing Inventory – will find out minimum size	DK
26	MMCD stores everything as a polygon, even if it is a ditch with standing water	NR
27	Ditches need to be both lines and polygons for mapping and analysis	CUB
28	Coordinate System – state guidelines – UTM Zone 15 extended, NAD83	
29	Easement information can relate to individual property ownership (part or all of wetlands)	JH
30	RIM, Waterbank, CRP? Does Waterbank Program still exist?	ML
31	Wetland buffers – does it have a vegetative buffer area and how wide is it?	JH
32	Is my property affected by a wetland regulation – and which ones (BWSR, DNR, USACE); TRS or parcel; one-stop shopping –add to attribute file	RS
33	Match-up of soil interpretations and wetlands? (metadata - for source)	DNK
34	Knowing parcel ID, track back to ownership; note scale problems between wetland and parcel map	RS DNK
35	Wetlands on public lands – associated management plan data	RS
36	Identification for wetlands: every community numbers them. Do we need this? Check BWSR?	DH
37	Metro numbering #1 (MMCD): County + Township + Range + Section (Town Code Number, not straight PLS) + sequential number	NR

#	Data Specifications	ID
38	Metro numbering #2 (Hennepin County Inventory): T + R + S + sequential number (possible cross-reference to #37?)	DK
39	BWSR proposed a numbering system in their Drained Wetland Inventory Guidebook – 1991 (<i>facilitator note</i>)	SRM
40	Re numbering: some large wetlands – are they numbered as one or many? Some of this is weather-dependent. They may constitute one large wetland in rainy weather; many in drier weather . They may also be restoration-dependent.	NR DK
41	Wetland number – extend DOWLAKES # beyond type 3,4,5? 2.5 acre incorporated; 10 acre unincorporated; and if on PWI map	
	WETLAND TYPES	
42	Need more detailed typing based on vegetation than is in Cowardin	SMN, NR
43	Use MN land Cover Classification level 4&5 (level 3 is NWI)	JR
44	Exotics distribution (modifier to level 4 and 5 would let you do this)	SMN
45	Renumbering: What if a wetland covers more than one section?	

Feature: Watersheds

#	Data Specifications	ID
1	Scale/accuracy – Scale should be at least 1:24,000. Avoid mismatched boundaries	JH
2	Should always be updated. Watershed boundaries are changing all the time	RS SW CHS
3	Boundary should have line width/ confidence interval	CHS RS SW
4	Larger watershed with pointer or links to more detailed delineation (i.e., who has more detailed data on this watershed)	JR CHS

#	Data Specifications	ID
		NR
5	Delineate minor watersheds down to 1 square mile	SW
6	Need inventory on watershed delineation	RS
7	Need reviewed and updated data set	CHS
8	Type of study will determine needed scale/accuracy of delineation	RS
9	Line boundary: Who did it? Date updated? Method of delineation? Starting source data?	CHS
10	Watershed “polygon” ordering system- #/name major/minor watershed	CHS RS TO
11	Area of polygon	JH
12	Miles of shoreline of lake/stream	JH
13	Slope/range of elevation	JH
14	Flow direction/pattern w. ditches’ flow direction	RS PLD
15	Dominant general land use category (or % ag, % urban, etc.)	SW
16	Political association (city, county, watershed management organization, watershed district, lake association) some may have multiple cities, WMO’s, etc..	CHS RS JH SW MCD DK
17	Natural & political boundaries of watershed	PLD
18	% of watershed within “contour group” – range of elevations	GMD
19	# of lakes in watershed (> 1 square mile, etc); # of type x wetlands in watershed	SMN
20	Text – watershed ID#	DH
21	Names of watercourses	PLD

#	Data Specifications	ID
		DH
22	Connectivity of subwatersheds – with watershed ID’s or between watersheds ex. Blue Earth R. (giving watershed) to MN R. (receiving watershed)	MJ TO SMC RMG
23	Major roads – spatial relationships	SMN
24	Related to coverage of normal precipitation, snow, ET, etc.	GMD
25	Related to TP40 Ref or SCS maps	PLD
26	Incorporate storm sewers (urban) and drain tiles (rural) into boundary delineation	MJ DH
27	% lake by area; % storage to use in regression equation	PLD
28	General soil type	GMD
29	General vegetation type	GMD
30	Watershed centroid node/point	GMD
31	River segment	MJ
32	Structure locations (dam, reservoir, culverts, gages)	PLD
33	Landlocked areas identified; how to treat them; frequency with which landlocked areas start to contribute	DH
34	Minimum 2-foot contour used for delineation of watershed (3-meter horizontal accuracy)	JR
35	Up to 6-inch contour used for delineation for Red River Valley	CUB
36	Any “corrections” or ground shifts for data projection	DK
37	Endangered or exotic species/resources	AAB
38	Table or link to quality, fishing, related databases	ML
39	Multiple ID – link to universal ID # - DNR Major watershed; USGS HUC, NRCS	SMC
40	Relational database with unique ID’s	RMG
41	Possible sources of contamination	SMC
42	Ownership/parcel information	LVS

#	Data Specifications	ID
43	Coordinate System	NR

Feature: Rivers

#	Data Specifications	ID
1	Network Model	RW
2	Standard ID Statewide (this is critical!)	ML, DH
3	Flow data from gages – - historical - -daily - -discharge elevation curve	PLD
4	Location of structures: (bridges, culverts, dams)	PLD
5	Responsible party for structures in #5	NR
6	Link to DNR HEC2 models (and perhaps other models). Usually linked to a point along the river	PLD RW
7	Location of sampling points (e.g., MPCA) Water quality – water, - sediments, at least quarterly; monthly better, to get trends over time.	ML LVS
8	Flow, temperature, pH, turbidity, conductivity	LVS
9	Phosphorus, nitrogen, suspended solids, dissolved oxygen (BOD), toxics	ML
10	Standardized location and delineation (so you can compare data over time knowing it's from the same place).	RW
11	Description of accuracy that lets you know it's good enough for your needs	RW, LVS
12	Frequency of samples may vary depending on weather conditions or other variables	DNK
13	Is it a trout stream?	PLD
14	Location of ice jams	PLD

#	Data Specifications	ID
15	Shoreland information – e.g., land use, degree of development (trend important)	ML
16	Fish stocking: species, year, size of fish	JM
17	Natural fish populations – species, size	JM
18	River levels; rapids, class of rapids - for recreation	JM
19	Bring together different existing information in single web-accessible form	JM
20	Relationship between river levels and rainfall (degree of flash-flooding)	SMC
21	Link with recreation information	JM
22	Bottom strata (mud, sand, . . .)	MJ
23	Dredging history (major rivers)	SMC
24	Withdrawals/appropriations (intakes, outfalls) - purpose, location, volume, permit information	SMN
25	Low flow (for fish management)	RS
26	Low flow (for determining effluent limits)	SMC
27	Channel centerline if hydraulic model exists (approx. 3-meter accuracy)	AAB
28	Metadata exists -horizontal and vertical positional accuracy -attribute and code descriptions - when it was made	RMG
29	Fish consumption advisories – species, size, contaminants	SMC JM
30	Current situation: fish consumption advisories exist on web for lakes but not for rivers	JM
31	Connections with other features (e.g., ground water, lakes)	SMC
32	Jurisdiction -national, state, county	JM

#	Data Specifications	ID
	-scenic rivers status and regulating authority	
33	Recent enough to river's current position so that it's credible to the public when displayed	DK
34	River stage at time of mapping (e.g., Minnesota River flooding on 1997 DOQ's)	NR
35	NAD83, UTM Coordinate system is preferred	NR
36	Public Access points	SW
37	Canoe and boating route (DNR-designated) -funding opportunities	SW
38	Location of navigation channel	NR
39	Both polygon and line models used. Tie back to state ID!!!!	DK
40	Ideal (flood insurance): - 1 or 2-foot contour data; - 1-3-meter horizontal accuracy	AAB
41	Standard units of measure, preferably metric	RMG
42	1:100,000 best (used for display in county geologic atlas and PRIM maps) less memory used	RMG
43	Location of cross-sections accurate to within 10 feet (3 meters)	AAB
44	Vegetation along banks. 1-acre minimum polygon size land cover (use can be interpreted). Especially important to curves since that affects erosion.	JR
45	Link to floodplain delineations: 3-meter horizontal accuracy – floodway – 100-year, 500-year, etc.	AAB
46	Standard feature definitions, nationally , not just statewide. Include names of features	RW
47	Location of exotics and threatened species	ML
48	1:24,000 or better	RW
49	Contours of overbanks	PLD
50	Distinguish intermittent and perennial	RW
51	Real-time flow data (could be link to internet)	PLD

#	Data Specifications	ID
52	Mapped as part of watershed	ML
53	Normal water level/elevation	DNK PLD
54	What jurisdiction is the river segment in? What regulations apply to that river segment?	RS
55	Where exactly in the river is the jurisdiction line?	JM
56	Location of potential contaminant sources (feedlots . . .); distance away; does buffer exist?	SMC
57	Water surface use (usually local zoning)	JM
58	Protection status	MJ
59	Beneficial use classification (Class 1-7): drinking water, recreation (aquatic life, swimming), industrial)	SMC
60	Location of deformed frogs	SMN
61	Soil along river, esp. areas of erosion	CUB
62	1:660 scale is used at MMCD. This gets features on the correct side of the road	NR
63	Need to be able to match DOQ's for display; otherwise you lose credibility	DK
64	Riparian land use, zoning	JH
65	Location of significant bank erosion, scour	JR
66	Location of structures (bridges, culverts, dams)	PLD
67	Responsible authority for structures	NR

Process Questionnaire

Foster explained that the goal of this activity is to collect feedback from participants and to make adjustments for future workgroup sessions. Each workgroup participant was asked to complete the evaluation form before they departed the workgroup meeting.

Question:	Pre-session Contact and Information	Explanation of Desired Outcomes	Question 1. Purpose of the Work - Obtain Focus?	Question 2. Identify and Define Hydrographic Features?	Question 3. Identify Priority Hydrographic Features?	Question 4. Desired Hydrographic Feature Specifications?	Question 5. Provide Workgroup with Next Steps?	Encourage Diverse Viewpoint	Obtain Consensus	Manage Time	Address Your Goals and Needs	Adequacy of Facilities	Usefulness of Hydrographic Information Needs Session	
Participant														
1	3	3	4	4	4	3	4	4	3	4	3	4	3	3.54
2	2	3	2	3	3	3	2	2	3	3	4	4	3	2.85
3	2	2	3	3	3	3	3	4	3	4	3	4	3	3.08
4	2	4	4	4	4	3	3	4	3	4	3	3	4	3.46
5	3	3	3	2	3	2	3	3	3	3	3	4	3	2.92
6	2	3	3	3	3	3	3	3	4	4	4	4	3	3.50
7	3	4	4	4	4	4	4	3	3	4	4	4	4	3.77
8	3	3	3	3	3	3	3	4	4	4	4	4	3	3.38
9	2	2	3	3	3	3	3	3	3	3	3	4	3	2.92
10	3	4	3	3	3	3	3	3	3	4	3	4	3	3.23
11	3	3	4	4	4	3	3	4	3	4	3	4	3	3.46
12	3	4	3	4	4	4	4	4	*	4	4	3	4	3.75
13	3	2	3	4	4	4	3	2	2	3	3	4	3	3.08
14	2	3	4	4	4	3	4	4	4	4	4	4	4	3.69
15	2	4	3	3	4	3	2	4	3	4	4	3	4	3.31
16	4	3	3	4	3	4	4	4	4	4	2	3	3	3.46
17	4	4	4	4	4	4	4	4	4	4	4	4	4	4.00
18	3	2	3	3	4	3	3	3	3	4	3	3	3	3.08
19	3	3	3	4	3	3	2	3	3	2	2	4	3	2.92
20	3	3	3	3	4	3	3	4	3	4	4	4	3	3.38
Avg	2.75	3.10	3.25	3.45	3.55	3.20	3.15	3.45	3.21	3.70	3.35	3.75	3.30	3.32

Ratings Summary (1-Needs Improvement, 2-Average, 3-Good, 4-Excellent)

* No Rating Submitted by Participant

Not all participants filled out a questionnaire.

Workgroup Process Comments

1. The process flowed well. Pace was good, neither too slow or too fast. Interesting to learn about data needs of other agencies.
2. Some of the feature definitions seemed arbitrary. I wonder if we would end up with the same ones if we had done a general information needs first? But this was efficient. Would have liked more representation from engineering base who design many of these features for cities and counties.
3. Moved along and kept to schedule. Breaking into small groups helps keep everyone involved and is much less frustrating for them then in one large group (previous sessions I've recorded at have gotten very tense as time went along and people felt they hadn't gotten to say what was really important. Could use a better description of what data specifications are needed - too hard to focus people on defining how they decide whether data is good.
4. Well Organized
5. I enjoyed being involved in this process and finding out on a general level that every one want pretty much the same thing.
6. Explain better what needs to go into the "Desired Hydrographic Feature Specifications" segment. We didn't quite know what was expected at first.
7. Should have had more clarity and control regarding associated coverages. Too many data needs expressions related to associated GIS coverages (e.x. land use, etc.)
8. Interesting process, good ideas, intriguing collection of people.
9. Hopefully the Governor's Council can act upon the recommendations that came out of this workshop. The resulting data ability to use shared data and information is enormous.
10. Good diversity in workgroup. Different entities were represented.
11. Great location and food. Good combination of local/state/federal representation.
12. Might have been better to have more separation between groups. Too noisy at times.
13. Good way to deal with large issues.
14. It was fun.
15. Excellent Organization. Room acoustics could be better.
16. Look forward to follow-up information.

Contacts for the Hydrographic Inventory

Participants were asked for Name, Organization, phone number of person to contact for the data inventory by the Governors Council Hydrography Committee. The data inventory assessment will start in January.

Mark Olsen, MPCA, GIS Coverages

Carrie Bartz, MPCA, GIS Coverages

Sylvia McCollor, MPCA, Water Quality Information

Mark Gernes, MPCA, Wetland Information

Nancy Read, MMCD, Wetlands for Metro Area, 651-643-8386

Susanne Maeder, LMIC, Hydrographic Information

Luke Van Santen, MnDOT, Hydrographic Information, 612-797-3802
Melanie Olson, MnDOT, Hydrographic Information, 612-797-3056
Aaron Buesing, USACE, St. Paul District, 651-290-5627
Dave Schuler, St. Paul Water Utility
Stephanie McNamara, Vadnais Lake WMO
Glenn Radde, MnDNR Waters
Petra DeWall, MnDOT, 612-582-1188
Joni Mauch, DNR Information Center, 651-297-4956
Terry Birkenstock, USACE
Keith LeClaire, USACE
Gary McDevitt, NWS, 612-361-6670 ext. 493
Curtis Borchert, Norman County SWCE, 218-584-5168
Donovan Koxvold, Hennepin Conservation District, 612-544-8572
Dave Thill, Hennepin Conservation District, Wetlands, 612-544-8572
Daphne Karypis, Science Museum
Jay Riggs, Dakota SWCD, 651-480-7779
Randy McGregor, MnDNR - Waters
Russ Schultz, MnDNR - Waters

Next Steps and Adjournment

At 3:35 p.m. Maeder and Foster thanked the participants for coming and putting in a solid day's work. Maeder explained that a turn-around document will be sent to all participants to review and comment on within three weeks of today's meeting. The definitions, priorities and data specifications will be shared with the Governor's Council Hydrography Committee at their next full committee meeting. There will also be a publication coming out to document the Hydrographic User Information Needs workgroup from the Governors Council and summarize the next steps. All information will be forwarded to the Hydrography Data Modeling workgroup for further review. Maeder asked if there was any interest by the participants to sit on the data modeling workgroup she would take their name and contact them prior to the next meeting. Foster stated that the MetroGIS Technical Advisory Team will review further data specifications for the top hydrographic priority information needs and recommend specific hydrographic data sets that meet their needs at the next Technical Advisory Team meeting in February. The turn around document will be available on the MetroGIS for distribution in PDF format when all edits have been completed.

Meeting adjourned at 3:45 p.m.