



MINNEHAHA CREEK
WATERSHED DISTRICT

Lake Nokomis/Hiawatha Area Meeting

November 30, 2017



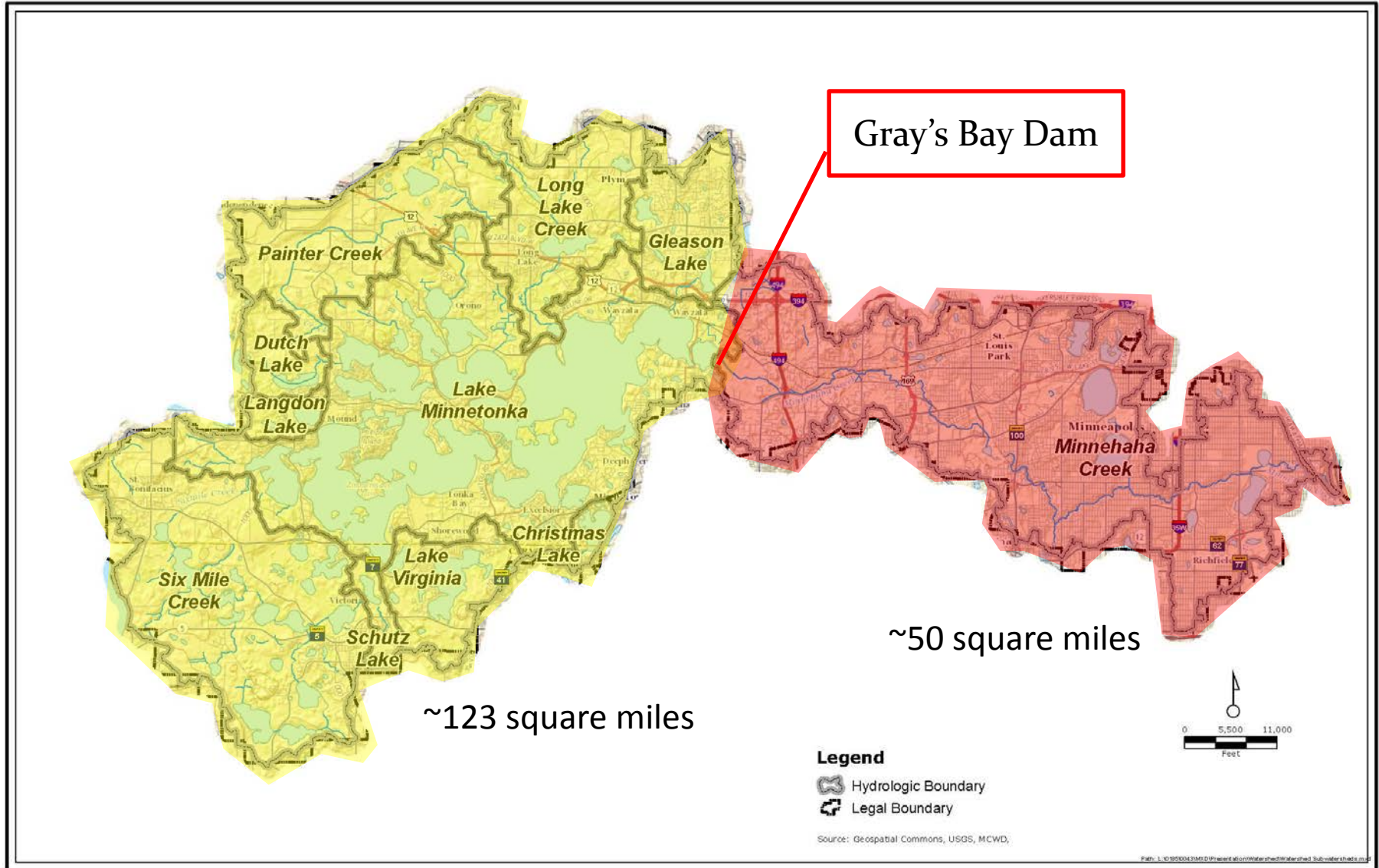
Outline

- Overview of MCWD
- Gray's Bay Dam
 - Management Goals
 - Operations
- MCWD Studies



Take Home Messages

- Issues around Lake Nokomis and Lake Hiawatha are minimally related to dam operations
- Record Breaking Precipitation
 - Historic flood in 2014, wettest Jan. 1- Jun 30 on record
 - 2016 wettest year on record
 - Aug. 2016 - July 2017 = wettest 12-months on record



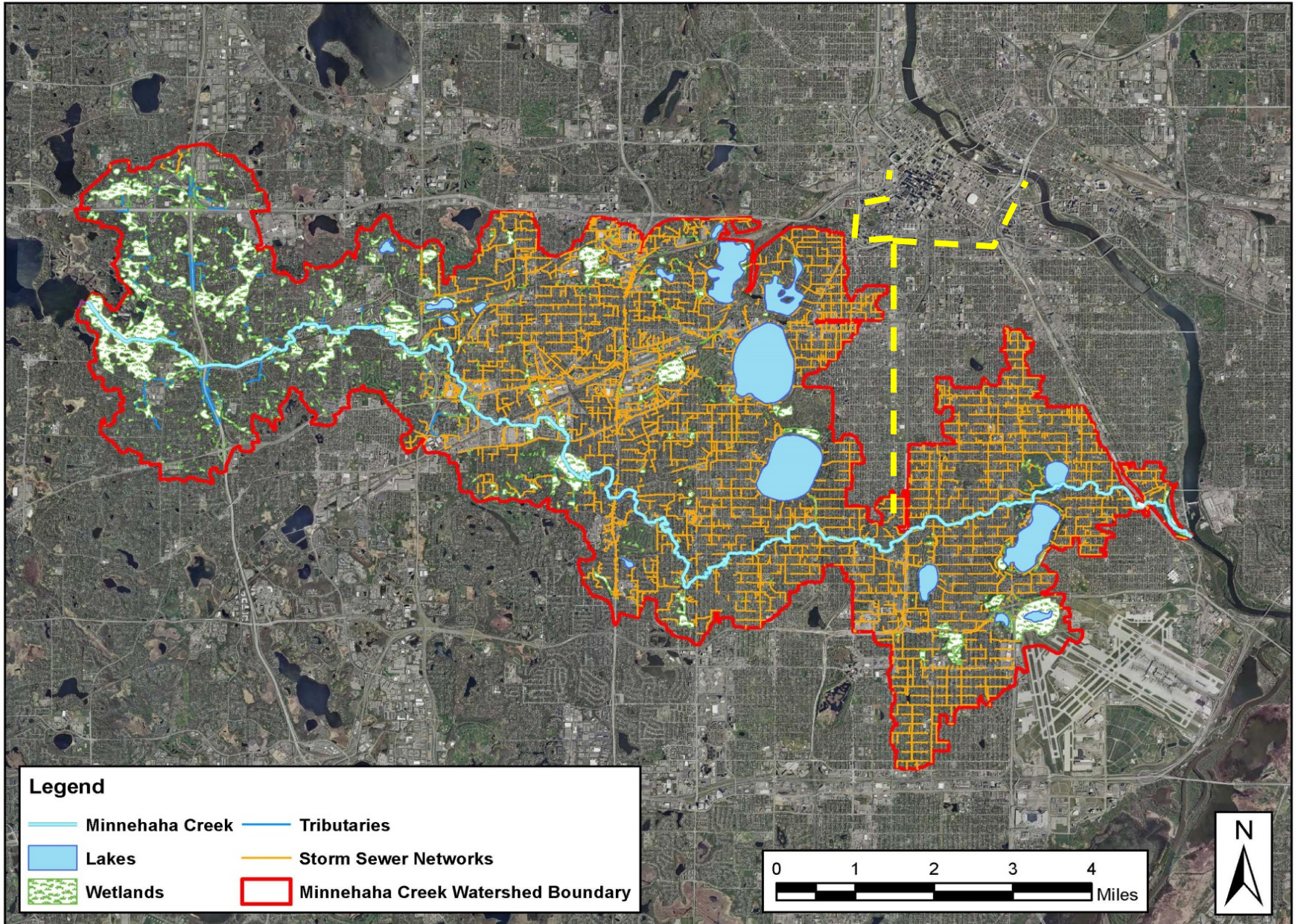
Prior to 2001



2001-2011



2012





1966 Flooding on Minnehaha Creek

- Flooding concerns due to increased runoff from newly settled areas created enough motion to get the MCWD going
- The big event: an ice-choked creek flooded Minneapolis neighborhoods in 1966



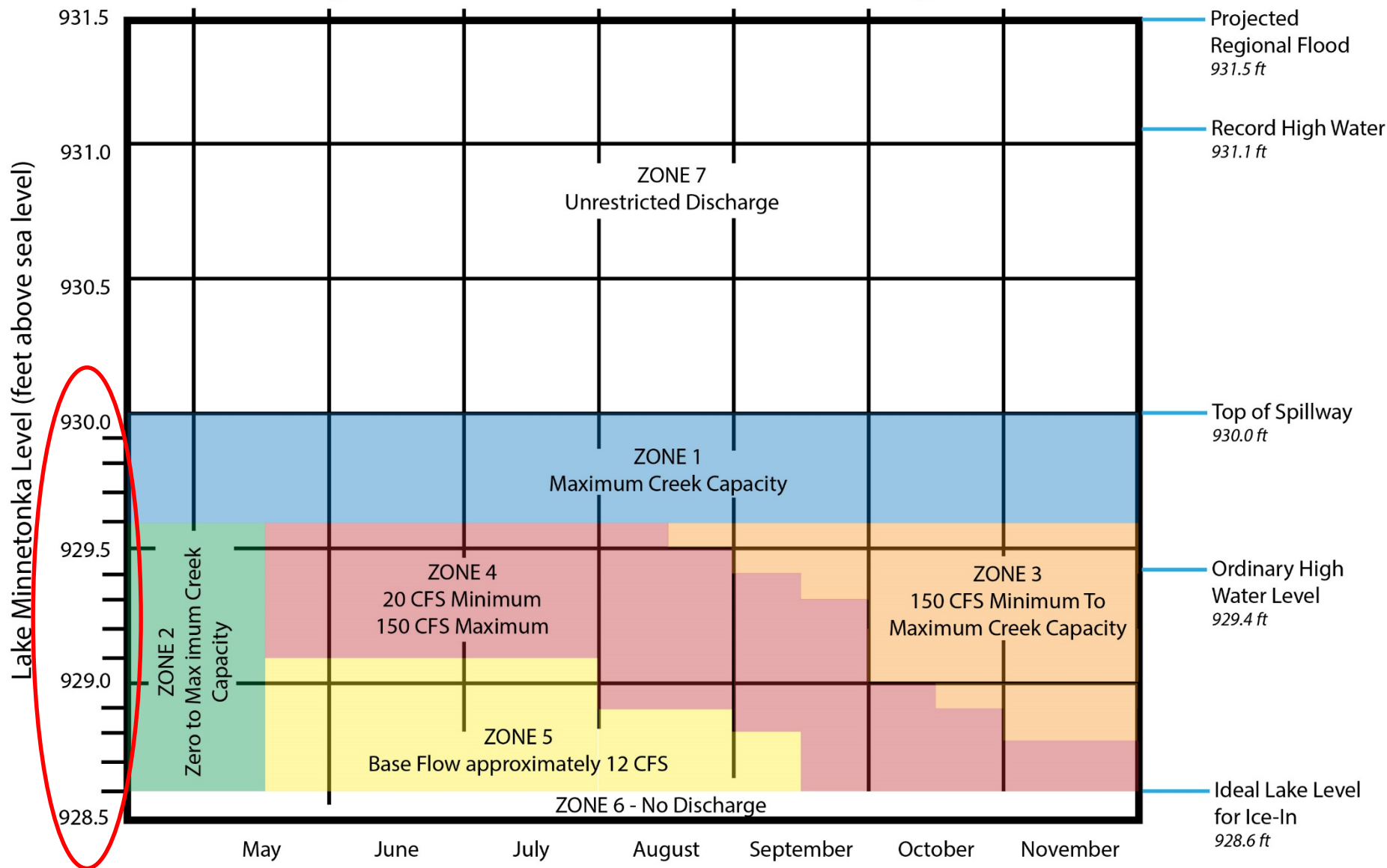




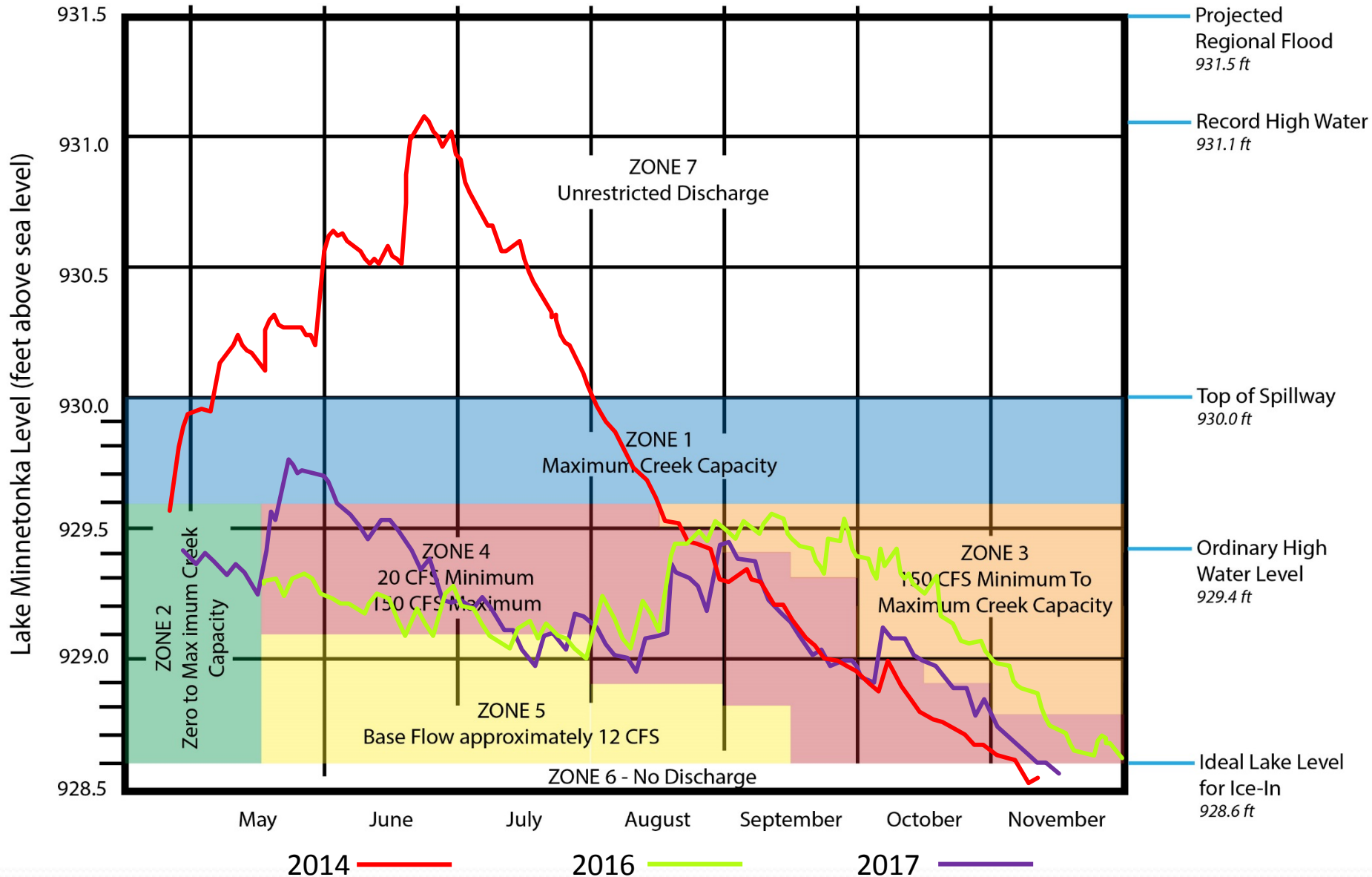
Dam Management Goals

- Reduce downstream flooding on creek whenever lake is within the physical limits of control
- Reduce flooding on lake by stabilizing levels between 928.6 and 929.4
- Reduce flooding on lake and creek by temporarily increase/decrease discharge prior to large volumes of runoff
- Provide discharge during dry periods to prevent detrimental effects of creek flow stagnation
- Enhance recreation, wildlife and aquatic life survival, and aesthetics, when feasible
- Improve or maintain conditions on the lake and creek, over those that existed prior to construction of the dam

Gray's Bay Control Structure Discharge Zones and Allowable Discharge Rates



Gray's Bay Control Structure Discharge Zones and Allowable Discharge Rates





Gray's Bay Dam



May 1, 2014



June 2, 2014





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Dam
Operations

Hennepin West Mesonet –
Weather Stations

National Weather Service –
Lake Minnetonka Simulation

Lake Minnetonka Level

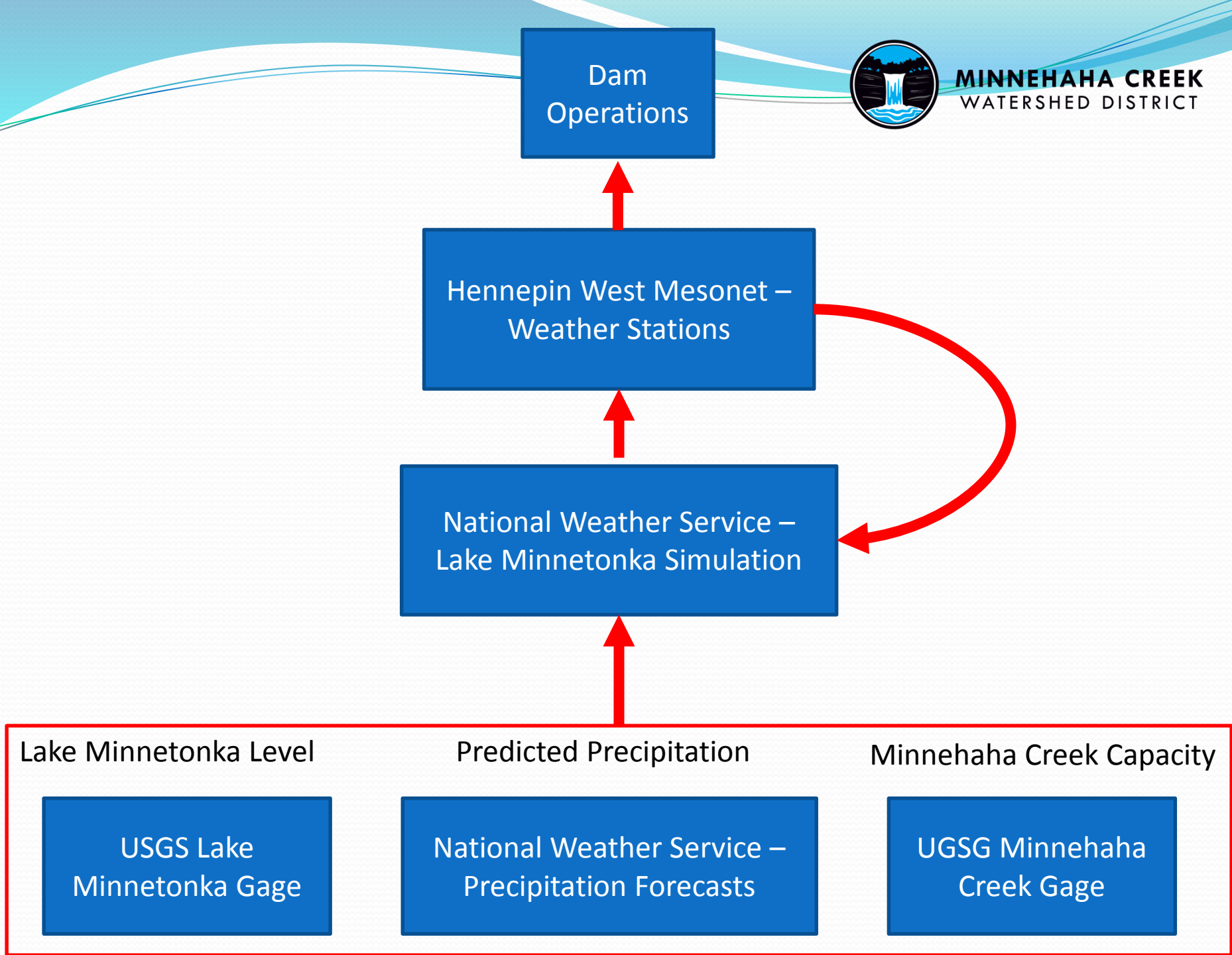
Predicted Precipitation

Minnehaha Creek Capacity

USGS Lake
Minnetonka Gage

National Weather Service –
Precipitation Forecasts

UGSG Minnehaha
Creek Gage





MCWD-NWS Partnership Success

- 2016 = wettest year on record
 - No flooding on Lake Minnetonka or Minnehaha Creek
- 2017 = Continued wet trend: Aug. 2016 – July 2017 wettest 12-month period on record
 - Able to utilize NWS lake prediction graphics to draw down Lake Minnetonka ahead of large storm events



2016 - 40.32"

1911 - 40.15"

1965 - 39.94"

1983 - 39.07"

1881 - 39.06"

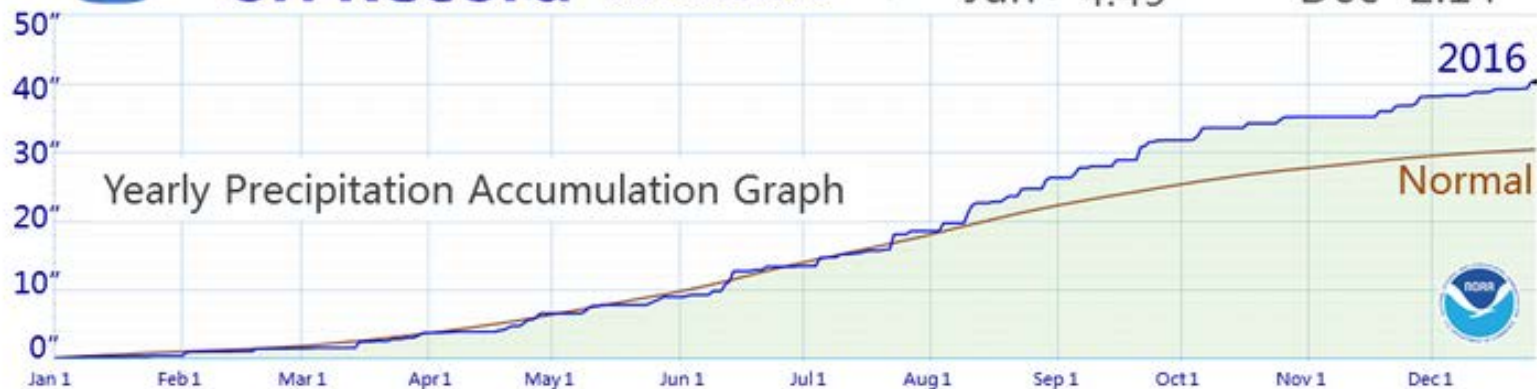


Twin Cities
40.32" in 2016

Wettest Year
on Record *data since 1871

Breakdown by month

Jan	0.31	Jul	5.09
Feb	1.09	Aug	7.82
Mar	2.26	Sep	5.47
Apr	2.84	Oct	3.41
May	2.42	Nov	2.98
Jun	4.49	Dec	2.14





NWS Twin Cities

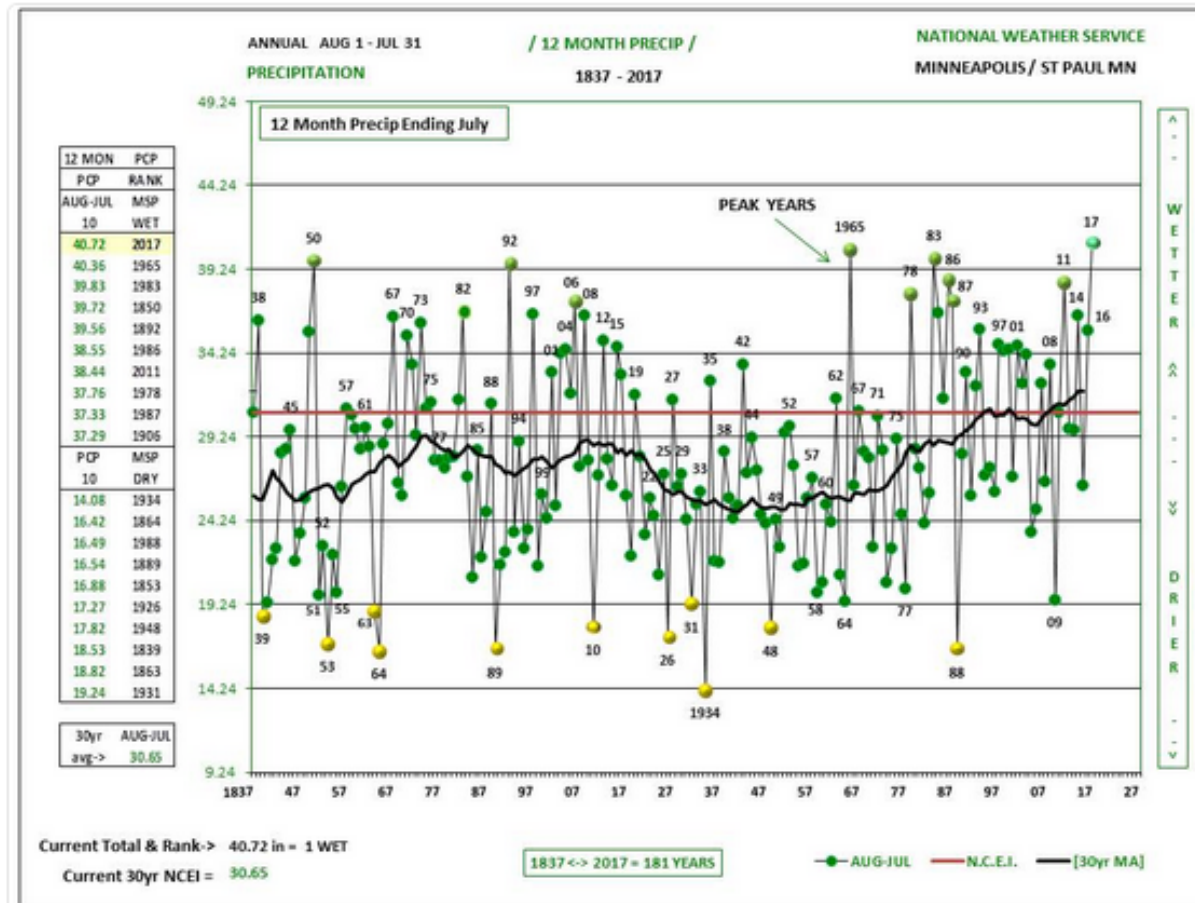
@NWSTwinCities

Following

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MSP #1 wettest 12 month (August through July) on record.

#mnwx #MSP



7:32 AM - 10 Aug 2017



2006-2012 Flow Balance

Source	Annual Volume (acre-feet)	Annual contribution (%)	Runoff depth (in)
Grays Bay	20,202	69%	3.1 ^{&}
Stormflow	5,498	18%	2.1
Baseflow	3,902	13%	1.5 [#]
Total flow, Minnehaha Creek	29,602	100%	---



[&]From area of watershed area above Gray's Bay

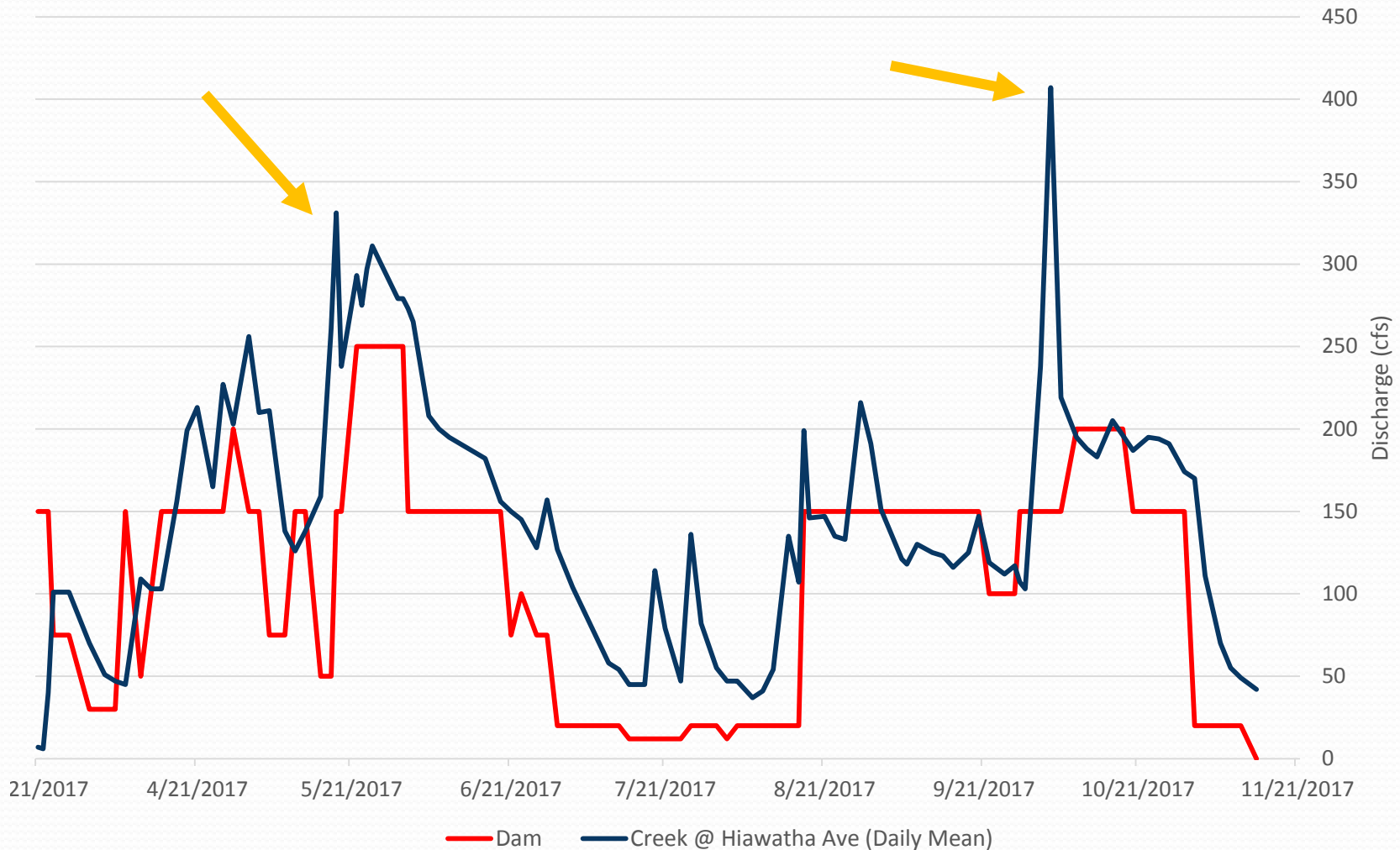
[#]0.25 – 0.3 inch/year is estimated to be ground water

Annual precipitation - 32.2 inch



Hydrograph at Hiawatha Ave & Dam Contribution

2017 Dam Discharge vs. Creek Flow @ Hiawatha Ave.





MCWD Studies

- Baseflow Restoration in Minnehaha Creek Watershed with Stormwater Infiltration, 2014
 - Evaluated baseflow sources
 - Quantification of site-level groundwater discharge through temperature profile and seepage meter measurements
 - Identified areas where stormwater runoff could be infiltrated and stored in the shallow aquifer to contribute to stream baseflow
- 2014 MCWD Flood Report
 - Characterized flood event and resource impacts
 - Defines District's role during flooding



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Questions?

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