

# Surviving the Flood

Two Case Studies related to  
Flooding in April 2013

By Gary Timmer, United Water

OTCO Procrastinators Workshop

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# April 2013

## **Two Utilities - Two States - Two Scenarios**

#1 – Flash Flood

#2 – Slowly Rising Water

# A Chicago Suburban Village April 18, 2013 Widespread Rain Event and Significant Flooding

## Chicago's Wettest April On Record in 143 years



# Village SCADA System: 62 miles of Collection System

19 Sanitary Sewer Lift Stations

4.7 MGD Daily Average & 10 MGD Max



# “Chicago's Wettest April On Record: City Sees Most Rainfall This Month In 143 Years Of Data”

USNEW.NBCNEWS.COM

“The weather was said to be responsible for two deaths.”

“...flooding in the Chicago area closed major expressways and led the evacuation of residents stuck in flooded homes, apartments and a hospital.”



“This month has officially been the wettest April on record”

“The deluge caused a water main break on Chicago’s South Side and the gushing water opened up a sinkhole that swallowed three cars.”

“Gov. Pat Quinn declared a state of emergency across Illinois.”

“Rain on Tuesday pushed the city's April total -- **8.54 inches through midnight** -- past the previous record of 8.33 inches set in 1947, according to the Chicago Tribune.”

# Widespread Flooding Occurred on April 18, 2013

## 6" rainfall



# Grit Removal System

○ Before



○ After



# Village Residents





# Park Basketball Courts

○ Before



○ After



# Storm Water

○ Before

○ After



# United Water partners with the Village

## ○ Preparation

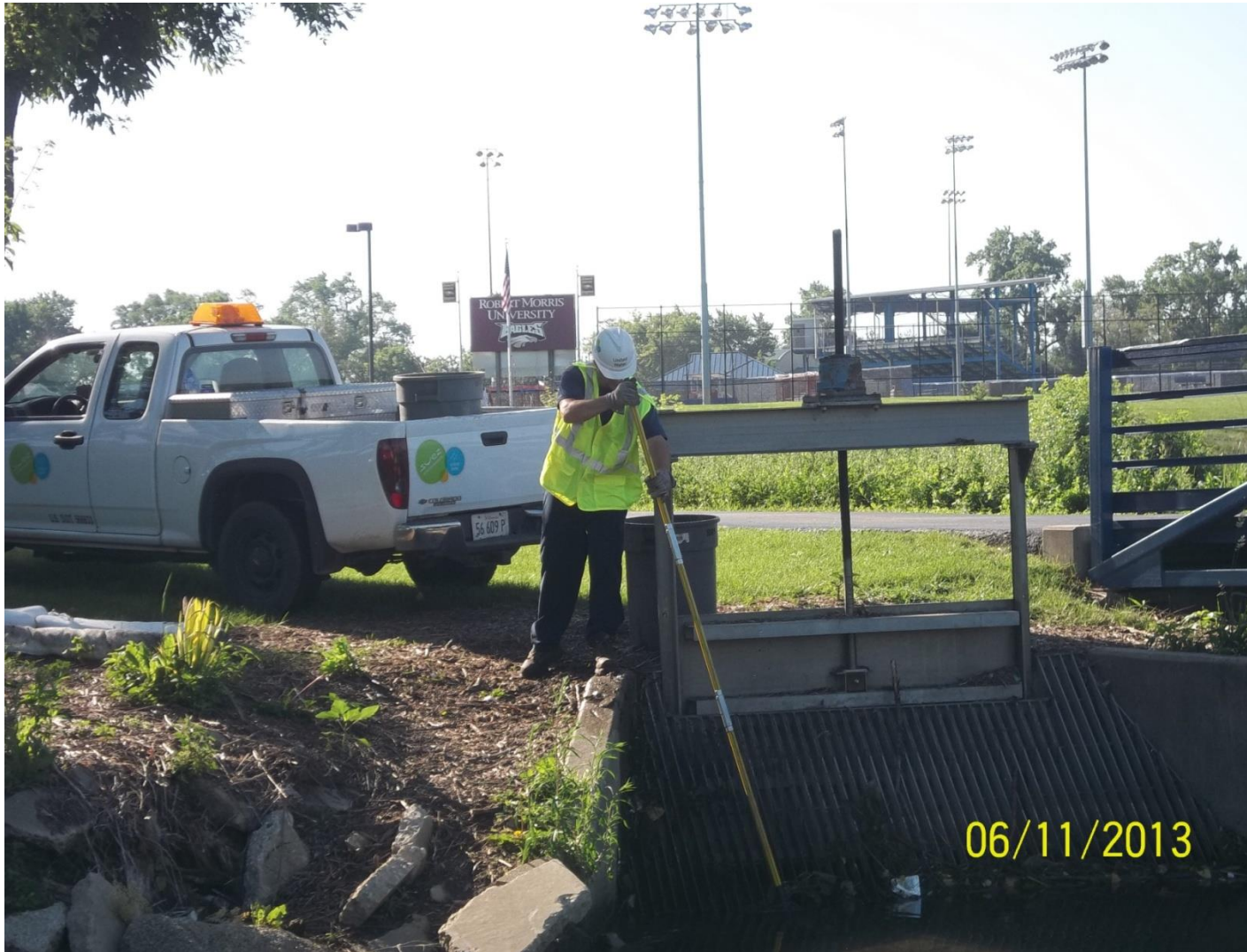
- Daily Staff Meeting on Rain Prediction/Forecast
- All Operators Changed Schedules to be Available (on-call) and an “All Hands on Deck” Approach
- Lowered Sludge Blanket Levels in Clairifiers
- Set-up Back Up Pumps on site
- Hooked up Portable Generator
- Tested Generators, Hot Spots Inspected
- Brought in Two 6in. Trash Pumps
- Cleaned Storm Drains and Grates
- Lowered Level in Park Storm Water Retention Pond (Pumped Down)



# Diesel Pump Setup



# Park Storm Water Grates Cleaning



# Portable Generator Setup



# Headworks Bypass Pumping



# Bypass Pump Setup





# Preparation for Flooding

To minimize the chance of blockages, we have developed annual cleaning programs; responding 24/7.



# Bio Solids Removal – 31 Loads Removed



# Challenges

- Village Phone System Went Down (no complaints)
- Critical Screw Pump Experienced Bearing Failure
- Electrical vaults filled with water
- Widespread Power Outages Anticipated
- Breaker Tripped - Two of Three Screw Pumps Turned Off
- Pump out of Service at Belmont Station (bypass pump setup)
- Neighboring (downstream) Community Called United Water to Shut Off Storm Water Pumps
- Plant Flow Increased to 28 MGD in excess flow
- Every Lift Station was in Alarm
- Grates for Screw Pumps Blew Off
- Sodium Bisulfate Controls Failed to Start
- Sodium Hypochlorite Requires Manual Adjustment, testing.

# Treatment Plant Flood



# Sewage Treatment Plant Parking Lot Flood



# Road Closures



# Upper-bearing Failure



# Thrust/Pillow Block bearing replacement: (After)

## Screw Pump # 3



## Bearing removal/repair





# Park Lift Station Underwater



# Excess Flow – 18 MGD



# Sanitary Sewer Manhole Surcharging



# Plant Headworks at Capacity



# Surcharge Manhole



## Lessons Learned

- Preparation saved time, money, and energy.
- SCADA helped to identify problem areas.
  - Remote monitoring and controlling was available.
  - \*Extremely high levels of water led to false readings (over range).
- Official logbook specifically helpful after the event.
  - Documentation of what was done, before, during, and after
- Ongoing communication with Public Works Director was deemed invaluable.
- Rain for rent bypass pumping operations manual was helpful.
- Major lift station has influent flow restricted prior to wet well, identified.
- In Response to Customer Service Issues:
  - The Village emergency services will pump out flooded basements.

# SCADA System – All Stations in Alarm



04/18/2013

# Park Flooding





# Village Overhead Sewer Program



# Questions?

**Next Year's Preparation!**

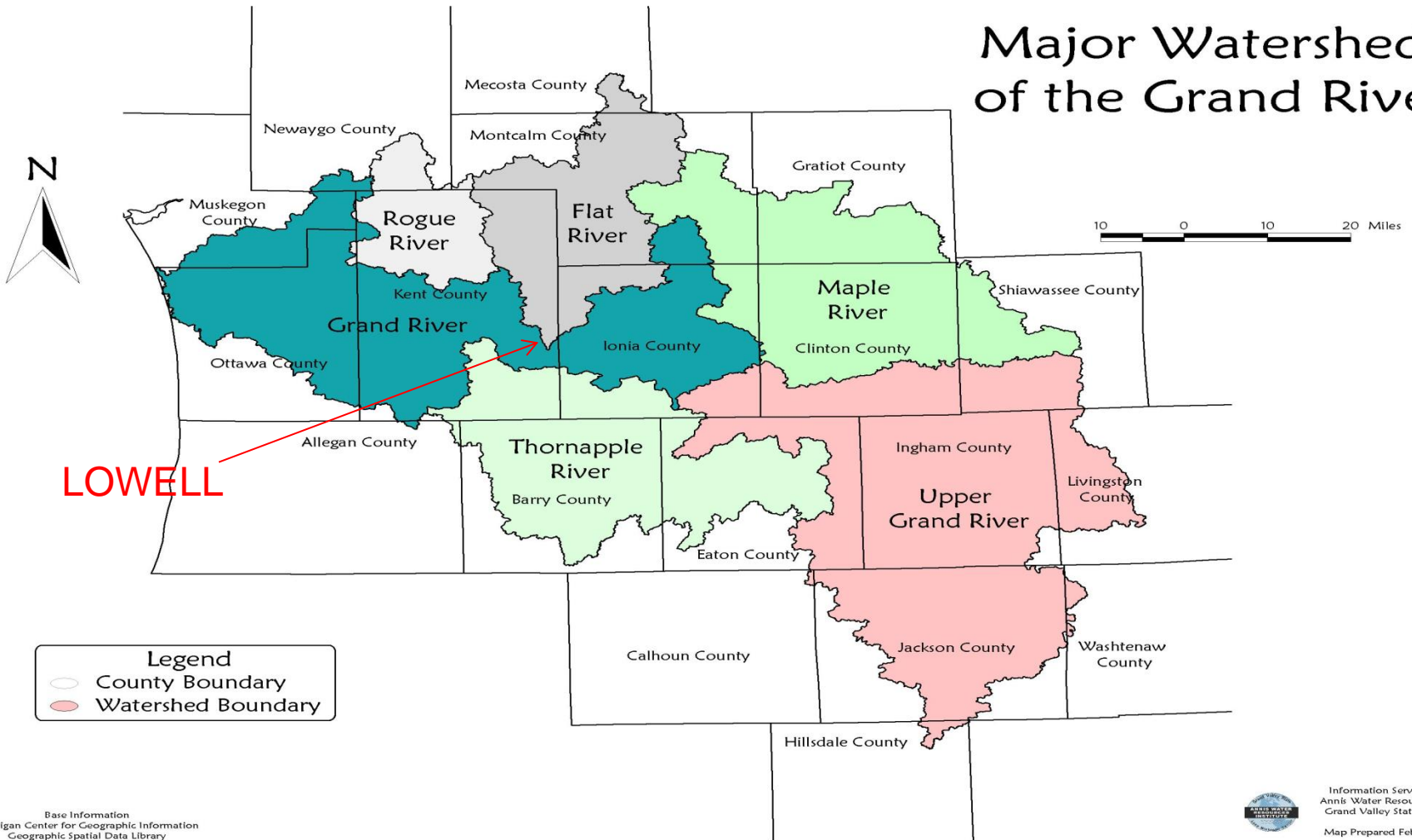


# City of Lowell, MI Wastewater Treatment Facility

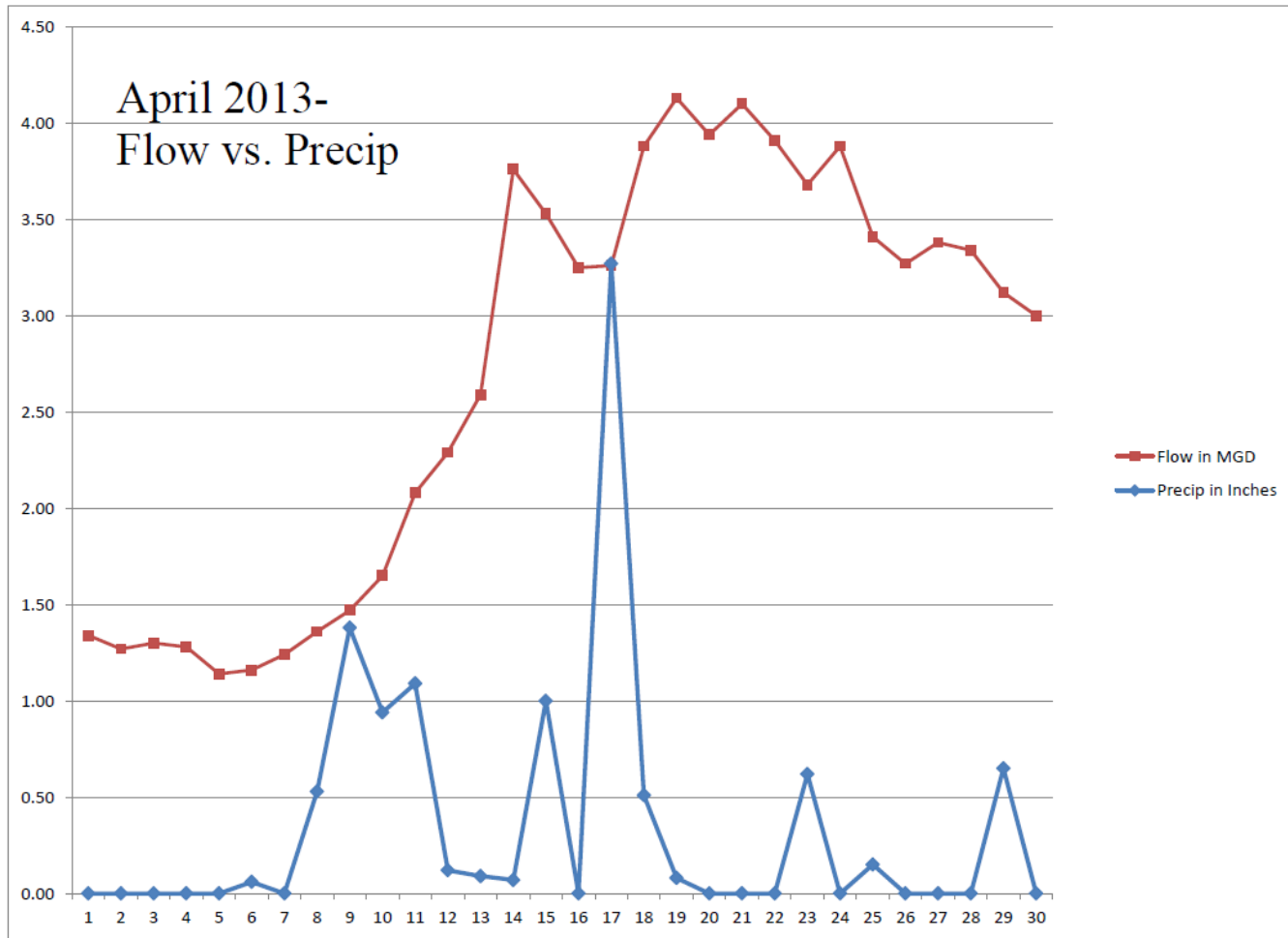


# Grand River Watersheds- 5 major rivers from parts of 19 counties

## Major Watersheds of the Grand River



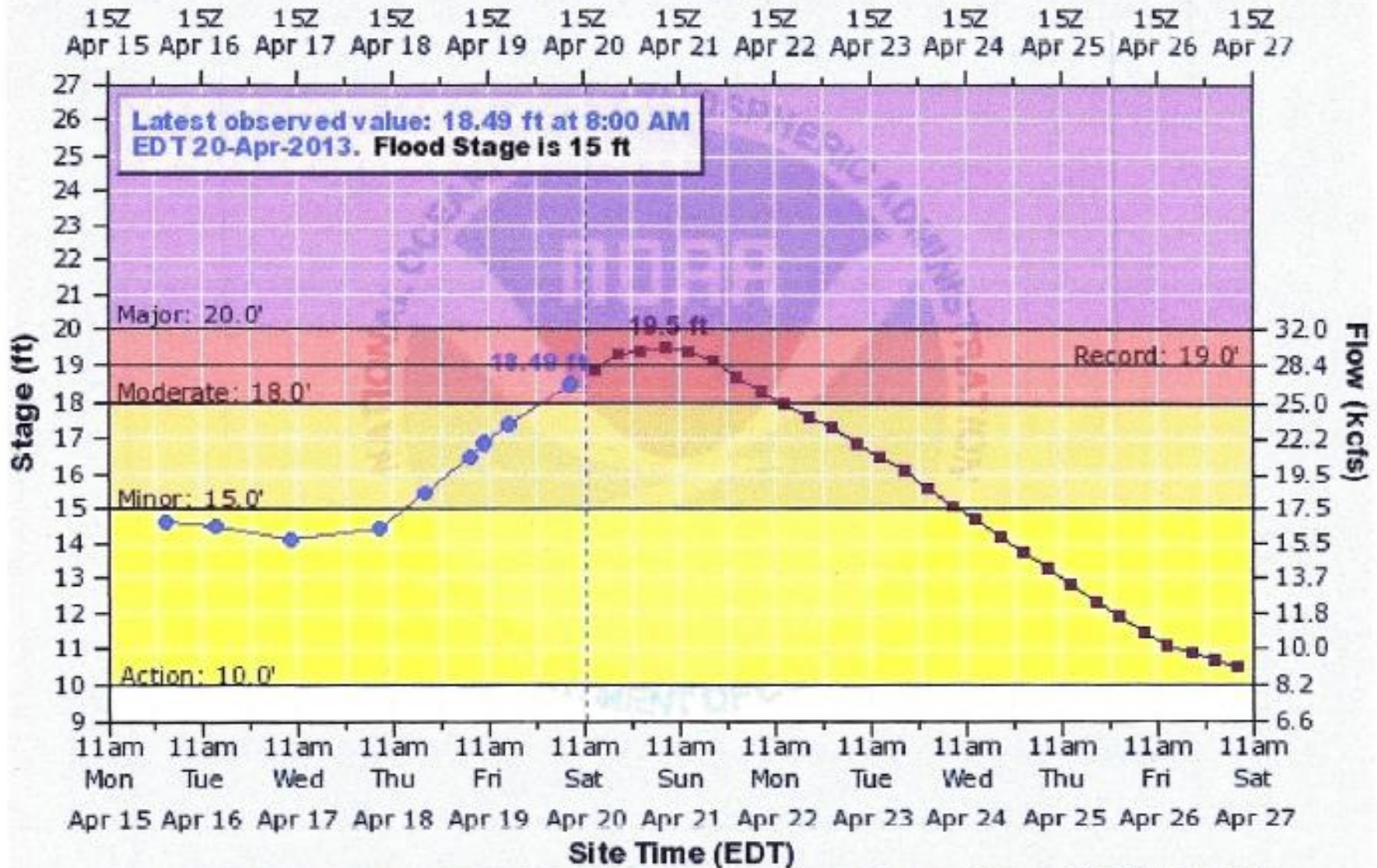
# *APRIL SHOWERS BRING MAY*





# GRAND RIVER AT LOWELL

Universal Time (UTC)



---- Graph Created (11:44AM Apr 20, 2013) —●— Observed —■— Forecast (issued 10:26AM Apr 20)

LWLM4(plotting HGIRZ) "Gage 0" Datum: 611.58'

# Notifications

- ✓ **Director of Public Works**
- ✓ **Lowell Police Department**
- ✓ **Lowell City Manager**
- ✓ **DEQ**