



Rain Gauge Installation

Watershed and Flood Study
Calibration

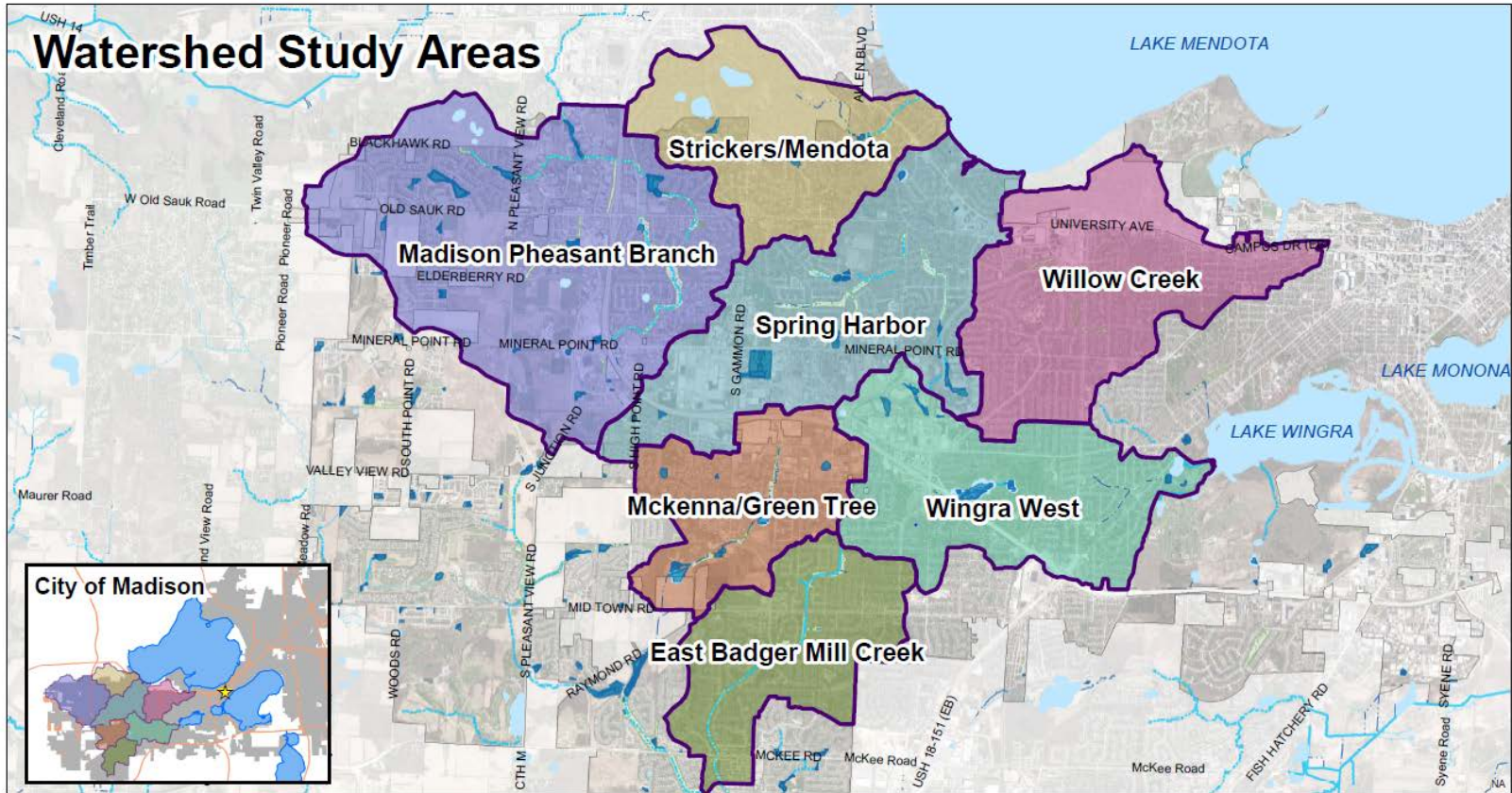
Purpose

- Need accurate information to model watersheds.
- Models are built based on information such as the GIS data for our storm sewer network, land use data, pervious and impervious area information and topographical information.
- Verify models with real life rain events (calibration)
- Used to simulate rain and flooding events and are used to help identify locations that are susceptible to flooding.
- Provide sound engineering design for implementation of proposed flood mitigation improvements.
- Will be used for planning of new developments and infrastructure.
- Suitable locations needed for differing types of equipment to get good data used to calibrate models.

Purpose

- City conducting 7 watershed studies in 2019
- Modeling of City may take 5+ years
- Contracting with USGS to install, monitor and maintain in 2019-2020
- City will take ownership after completion of initial studies

Watershed Studies in 2019



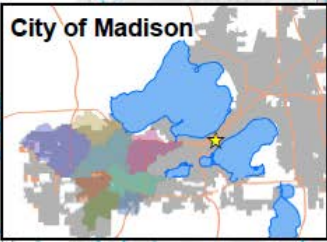
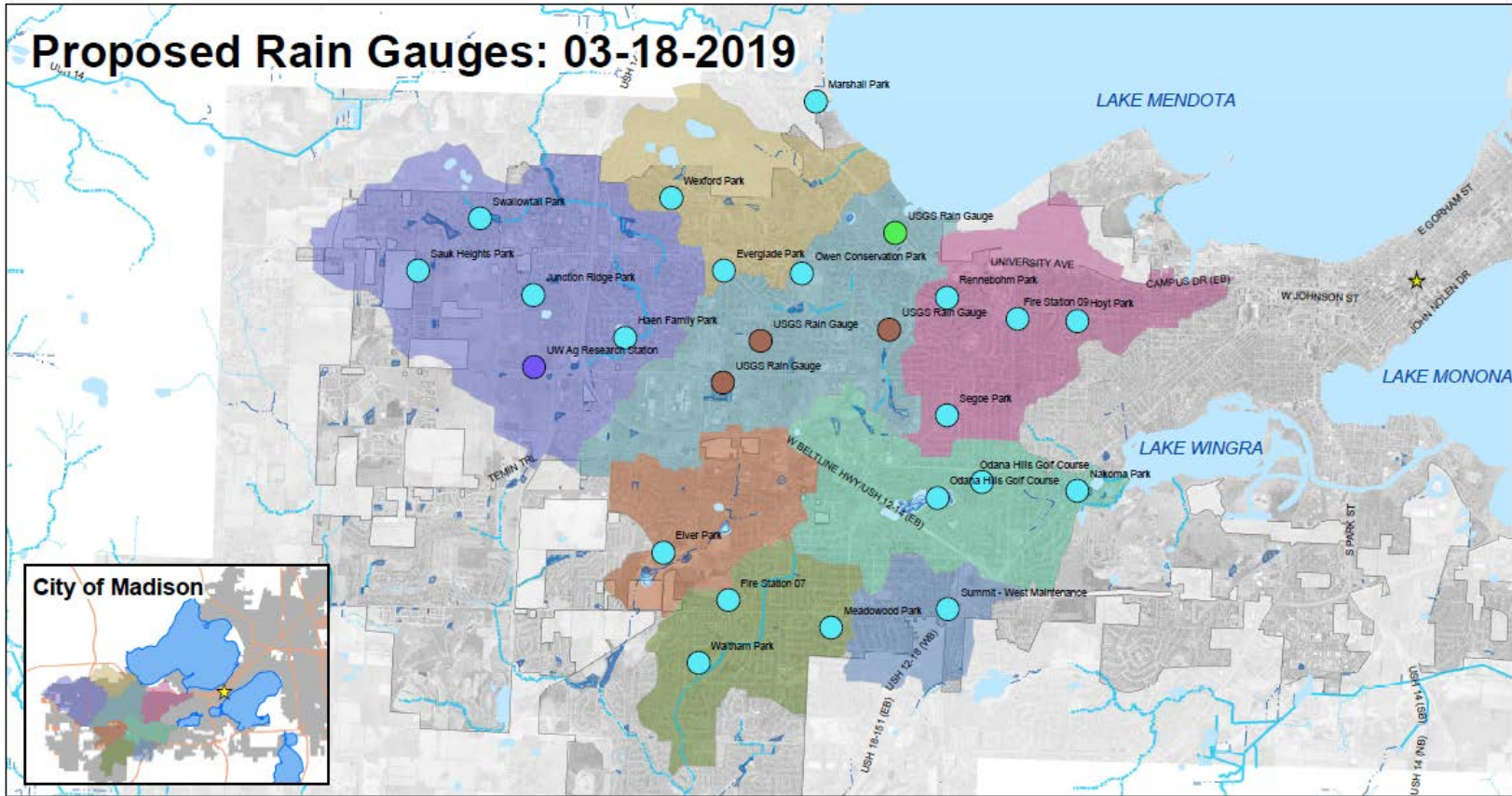
Locations

- Install on City owned property
- Spread evenly across watershed
- Limit access to tampering
- Different types of equipment
 - *Rain gauges – located in open areas
 - Parks property
 - Level and stage loggers – in channels, ponds or in/on storm sewer structures
 - Engineering property
 - Flow meters – in storm sewer pipes
 - Engineering property

Locations

Type	Ownership	Location	Location Type
Proposed USGS Rain Gauge	USGS	USGS Rain Gauge	
Ex USGS Rain Gauge	USGS	USGS Rain Gauge	
Ex USGS Rain Gauge	USGS	USGS Rain Gauge	
Ex USGS Rain Gauge	USGS	USGS Rain Gauge	
Proposed City Rain Gauge	Parks	Waltham Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Parks	Meadowood Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Parks	Summit - West Maintenance	Building - Maintenance
Proposed City Rain Gauge	Parks	Elver Park	Building - Restroom Building
Proposed City Rain Gauge	Parks	Odana Hills Golf Course	Building - Golf
Proposed City Rain Gauge	Parks	Nakoma Park	Building - Maintenance
Proposed City Rain Gauge	Parks	Odana Hills Golf Course	Building - Golf Clubhouse
Proposed City Rain Gauge	Parks	Segoe Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Parks	Haen Family Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Parks	Hoyt Park	Building - Large Shelter without Restrooms
Proposed City Rain Gauge	Parks	Junction Ridge Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Parks	Rennebohm Park	Building - Reservable Shelter with Restrooms
Proposed City Rain Gauge	Parks	Sauk Heights Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Parks	Owen Conservation Park	Building - Maintenance
Proposed City Rain Gauge	Parks	Everglade Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Parks	Swallowtail Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Parks	Wexford Park	Building - Sun Shelter Without Restrooms
Proposed City Rain Gauge	Fire	Fire Station 07	Building - Fire Station
Proposed City Rain Gauge	Fire	Fire Station 09	Building - Fire Station
Ex UW Ag Rain Gauge	UW	UW Ag Research Station	Building - Research Station
Proposed City Rain Gauge	Parks	Marshall Park	Building - Restroom Building

Locations



Rain Gauges

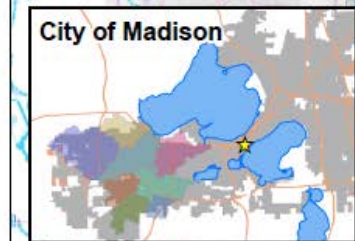
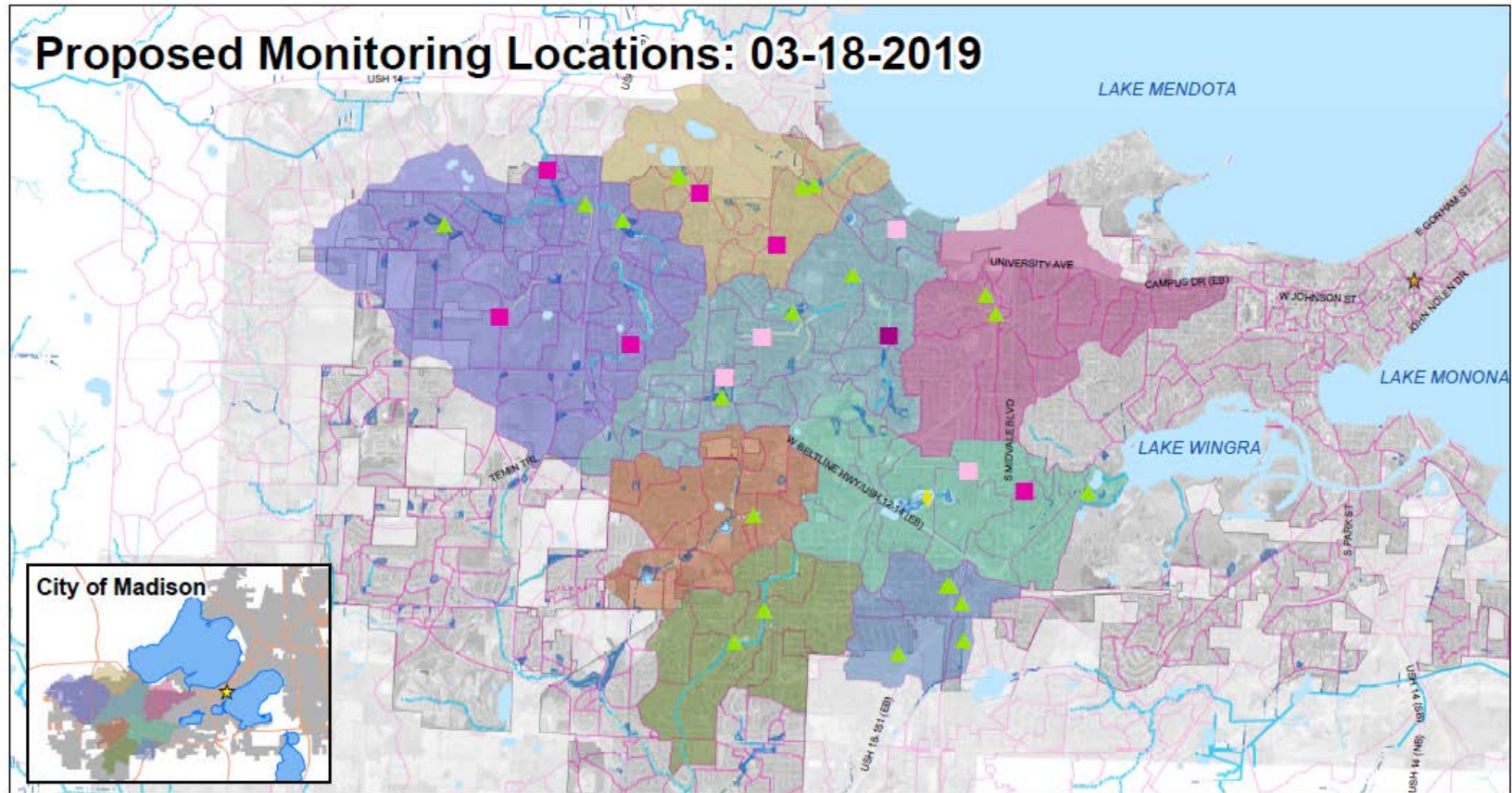
- Ex USGS Rain Gauge (3)
- Ex UW Ag Rain Gauge (1)
- Proposed City Rain Gauge (20)
- Proposed USGS Rain Gauge (1)

Hydrology

- Apparent Drainage
- - - Constructed Drainage
- - - Hidden Intermittent Stream
- - - Hidden Perennial Stream
- Intermittent Stream
- Perennial Stream



Locations



MonitoringPoints

- Ex USGS Flow Gauge (4)
- Existing MGE Gauge (1)
- Flow Meter (6)
- Level Logger (21)
- Repurposed USGS Flow Gauge (1)

Hydrology

- Apparent Drainage
- Constructed Drainage
- Hidden Intermittent Stream
- Hidden Perennial Stream
- Intermittent Stream
- Perennial Stream

Outfall Basins

- Ponds
- Greenways



Types

- 8" tipping bucket rain gauge with wireless data collector
- The cellular modem, antenna, process signal conditioning, data recorder and battery are integrated into a small IP68 rated enclosure for a combined weight of 2.5 pounds and measuring 4" L x 4" W x 3" H.
- The Telog RG-32A is small enough to install on the pole or mounting platform attaching the rain gauge.
- Only connection required is the rain gauge.

Examples



Tipping bucket rain gage with data logger
Flush mount and pole mounted

Schedule

- Install for 2019 rain season
 - April-May through November 2019
- City would take over maintenance and ownership
- May leave in certain locations if agreeable or relocate to new locations