Des Plaines River Watershed Workgroup

Flow Monitoring

Why flow?

- Watershed assessment
  - Physical, chemical, and biological
- Prioritize
  - Water quality
  - Habitat
  - Biological communities

- Approach: easier to measure stage than discharge
- Application
  - Prioritization tool
  - Identify opportunities
  - Build database - reduce variability

Watershed Planning

Watershed Characterization

Compile existing info

New data:

- WQ
- Habitat
- Biological
- Flow

Watershed Assessment

New & existing data

Causes and sources

Critical areas and hot-spots

Prioritized Action Plan

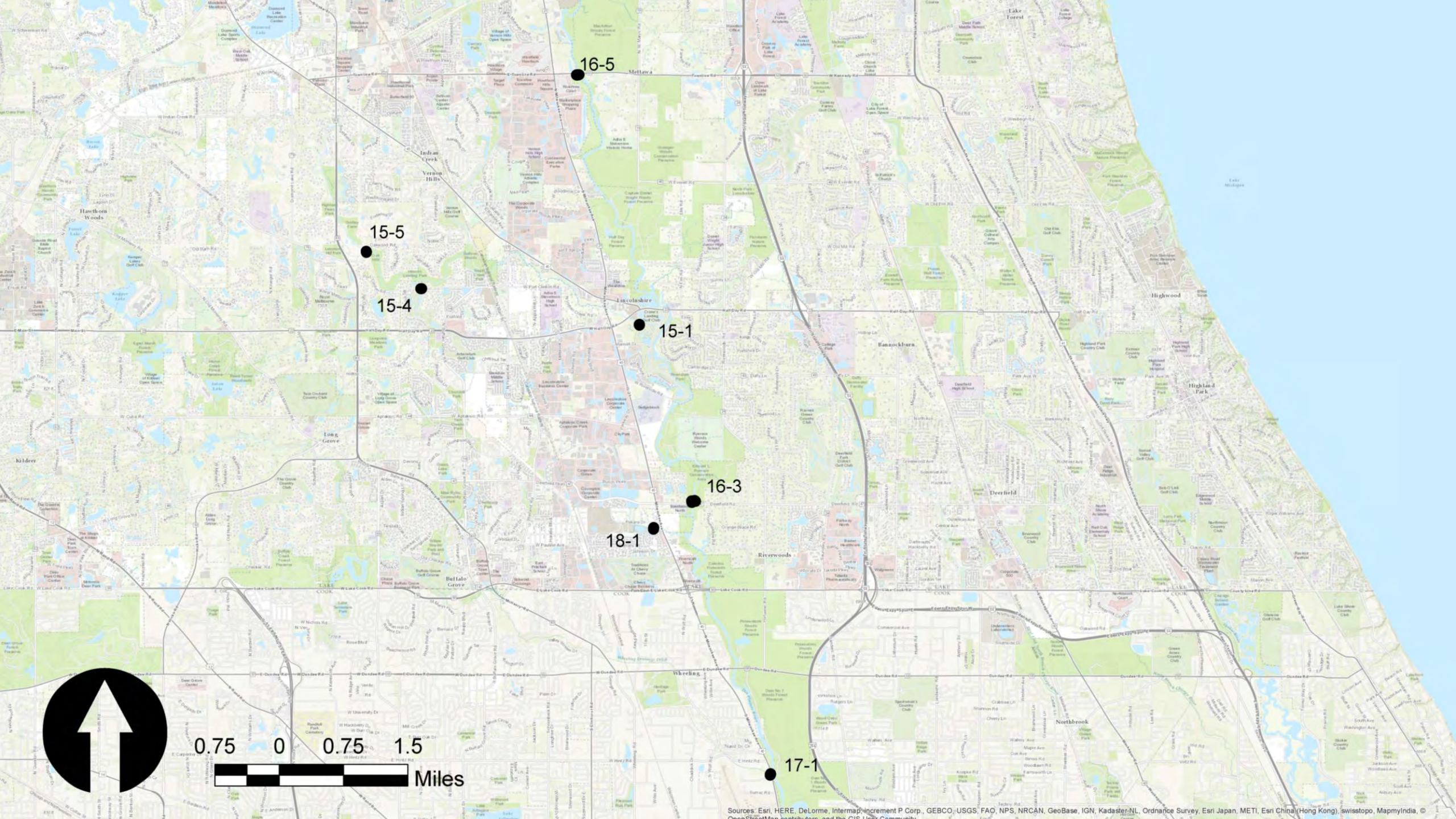
BMPs

Habitat restoration

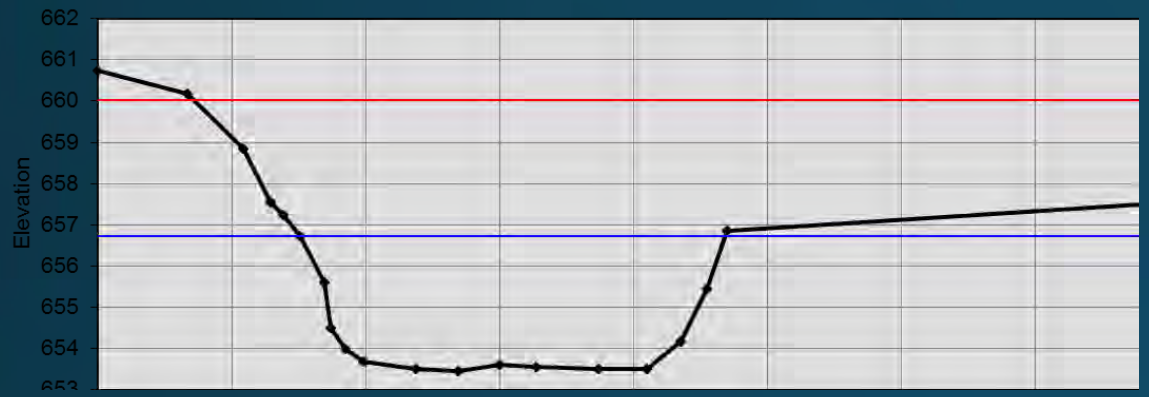
Stormwater management

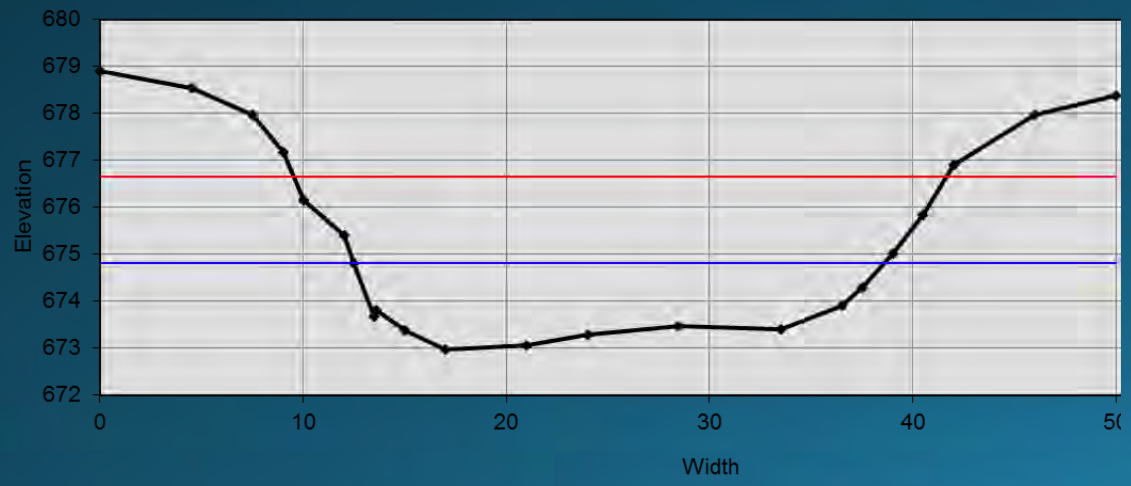
Wetlands and floodplains

Open spaces


16-5
15-5
15-4
15-1
16-3
18-1
17-1
0.75 0 0.75 1.5
Miles
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, ©

Stream Channel Survey

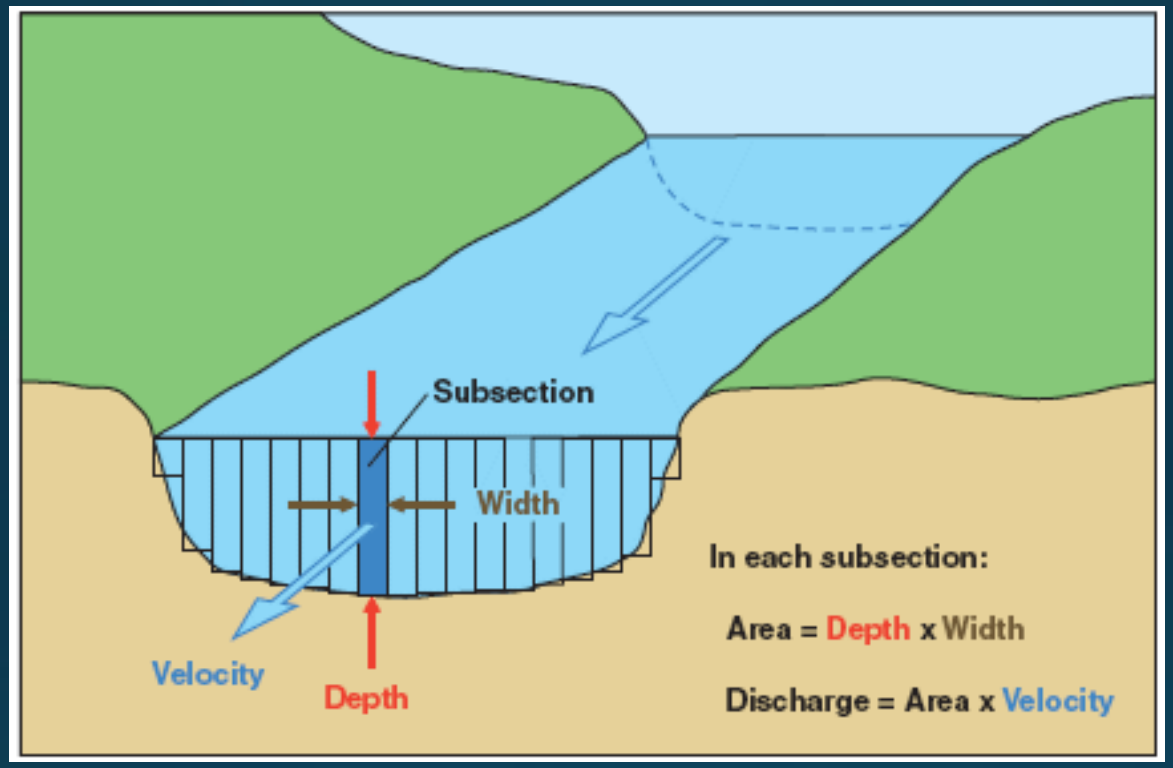




Stage

Discharge

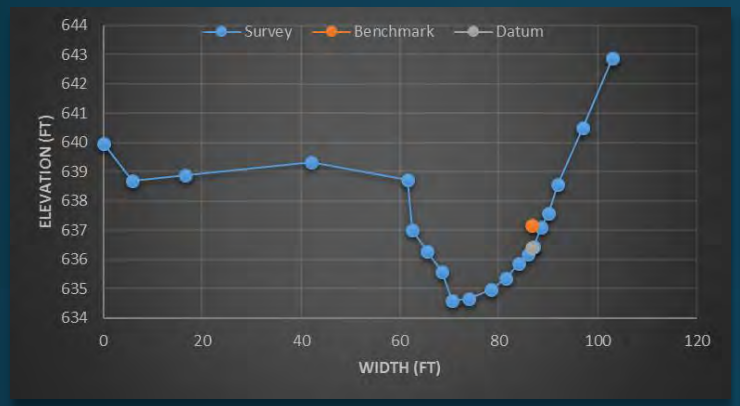
- 6 discharge measurements at 15 locations
- Variability
  - High and low flow events
  - Seasonal and precipitation
- 1 or 2 scientists
  - Measured flow, datalogger download/maintenance

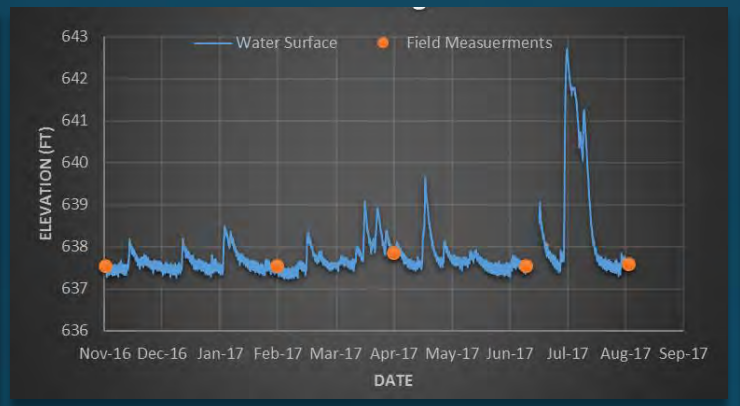


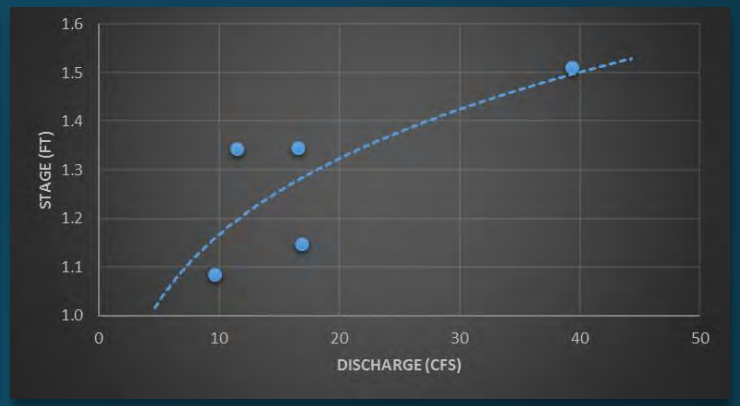
Velocity-Area Method

- Q=AV
  - Q= discharge
  - A= cross-sectional area of stream
  - V= average velocity

Data







X-Section

Survey

Local benchmarks

Stage

Water surface elevation

Hydrograph

Discharge

Cubic feet per second

Rating curve development

$$q = K(z - z_0)^b$$

Rating Curve

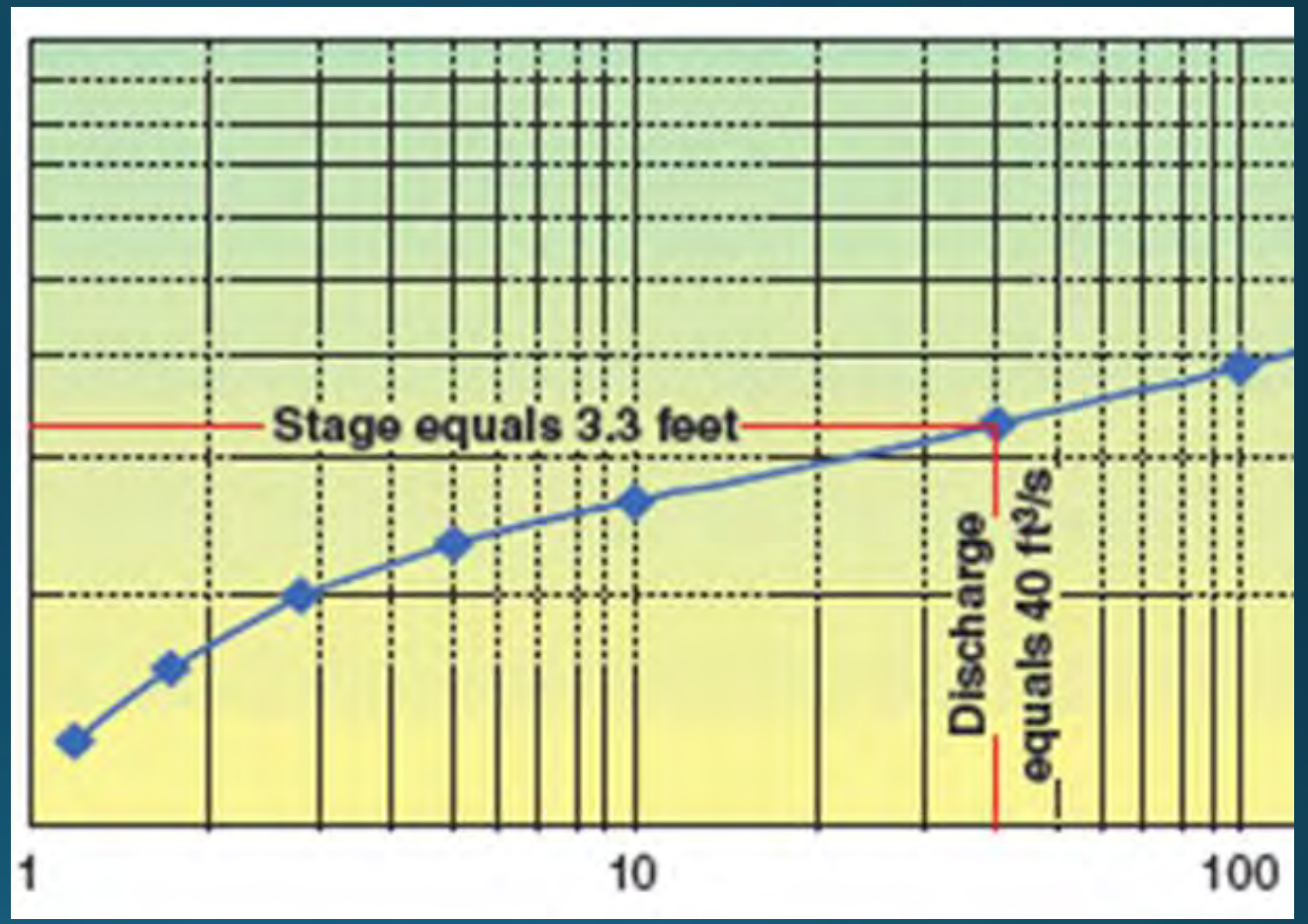
q=discharge

z= stage

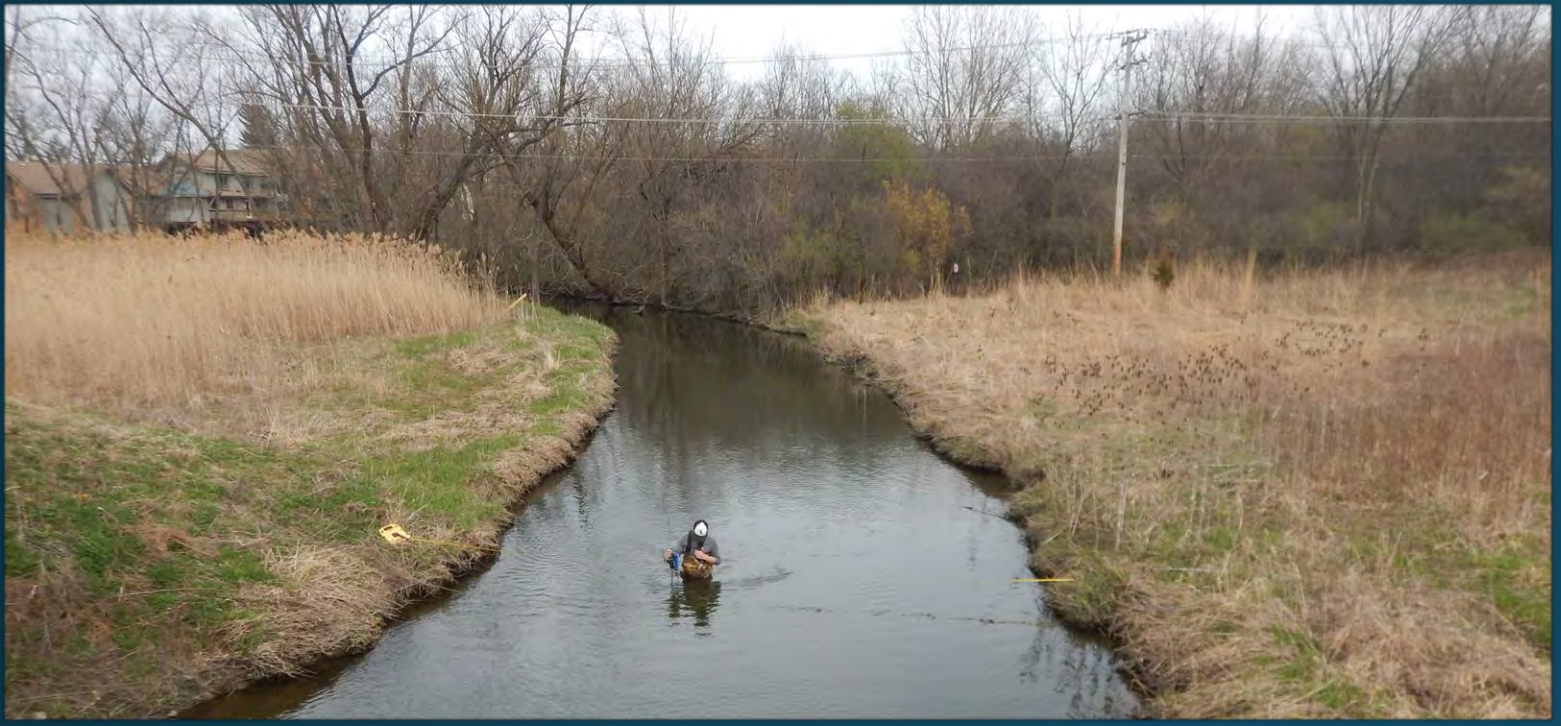
K, *b*, and z_o= constants

log(q)=log(K)+b log(z- z_o)

Slope (b) and intercept (log[K])

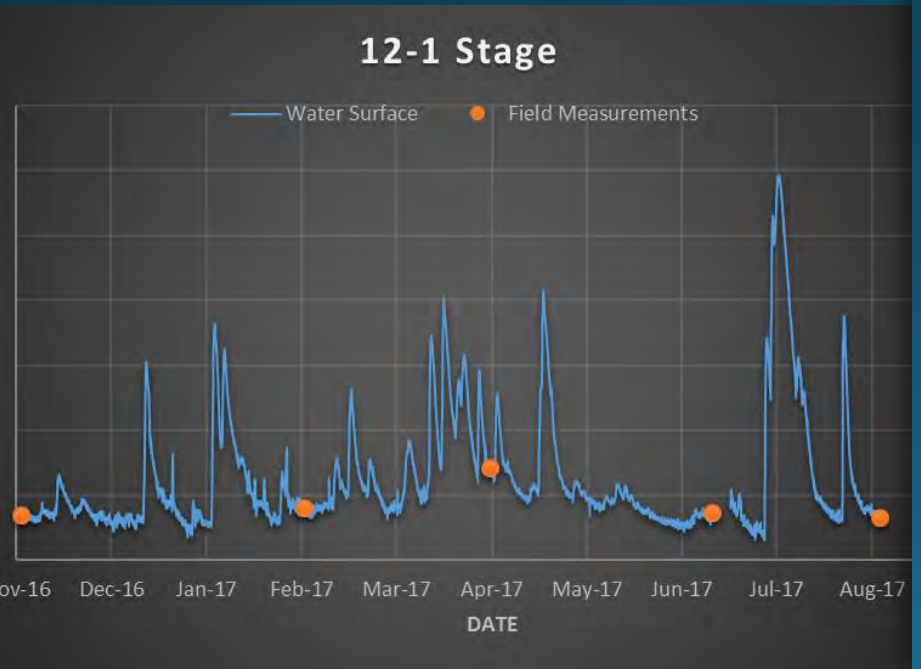


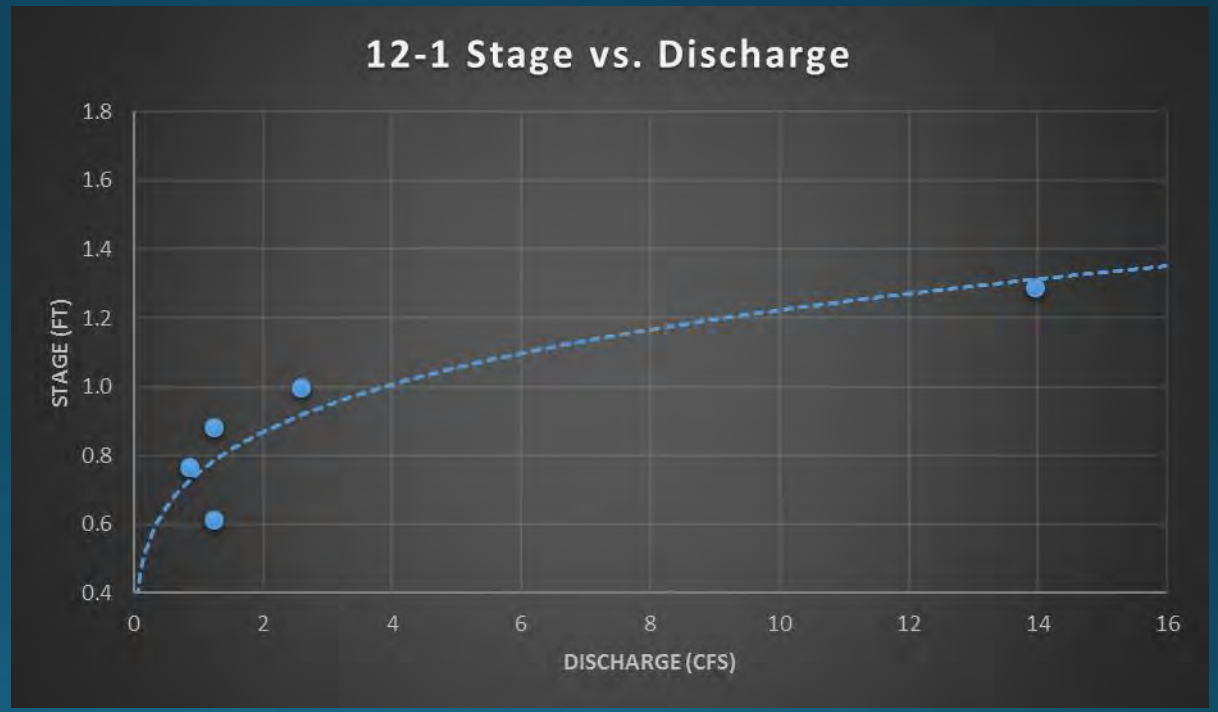
Variability

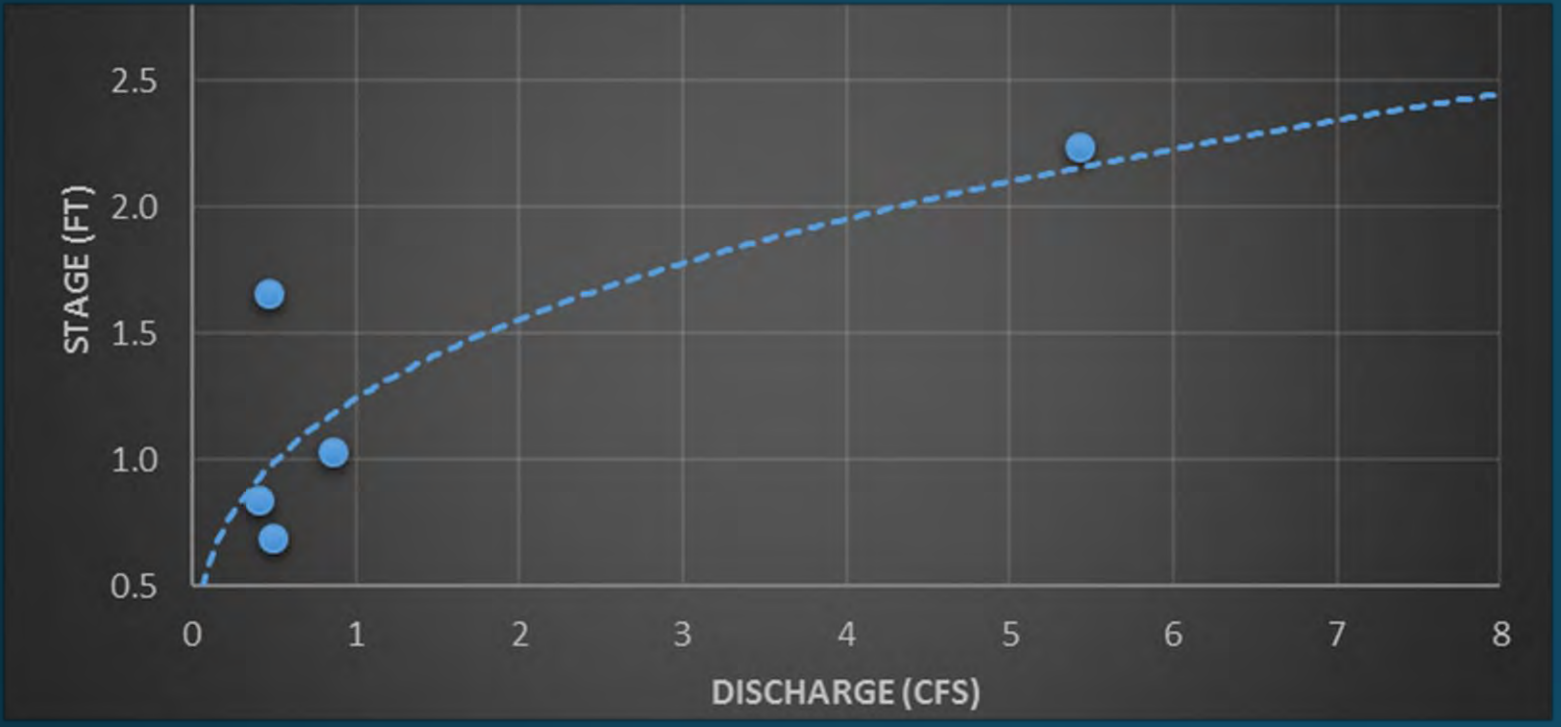


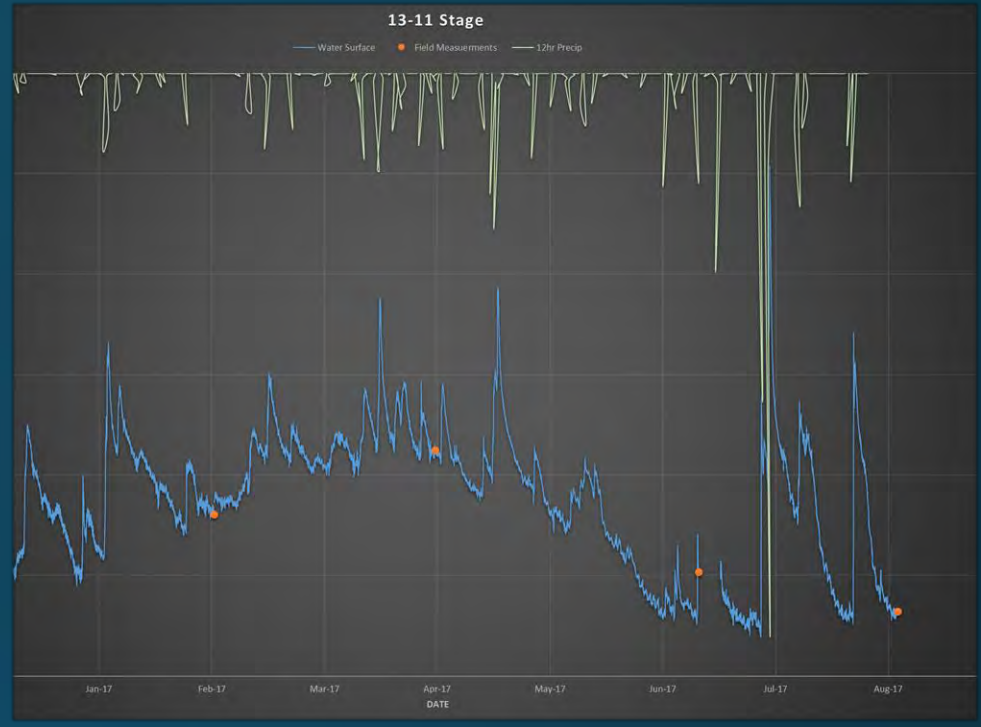
Wadeable

Newport Drainage Ditch @ Kilbourne Rd



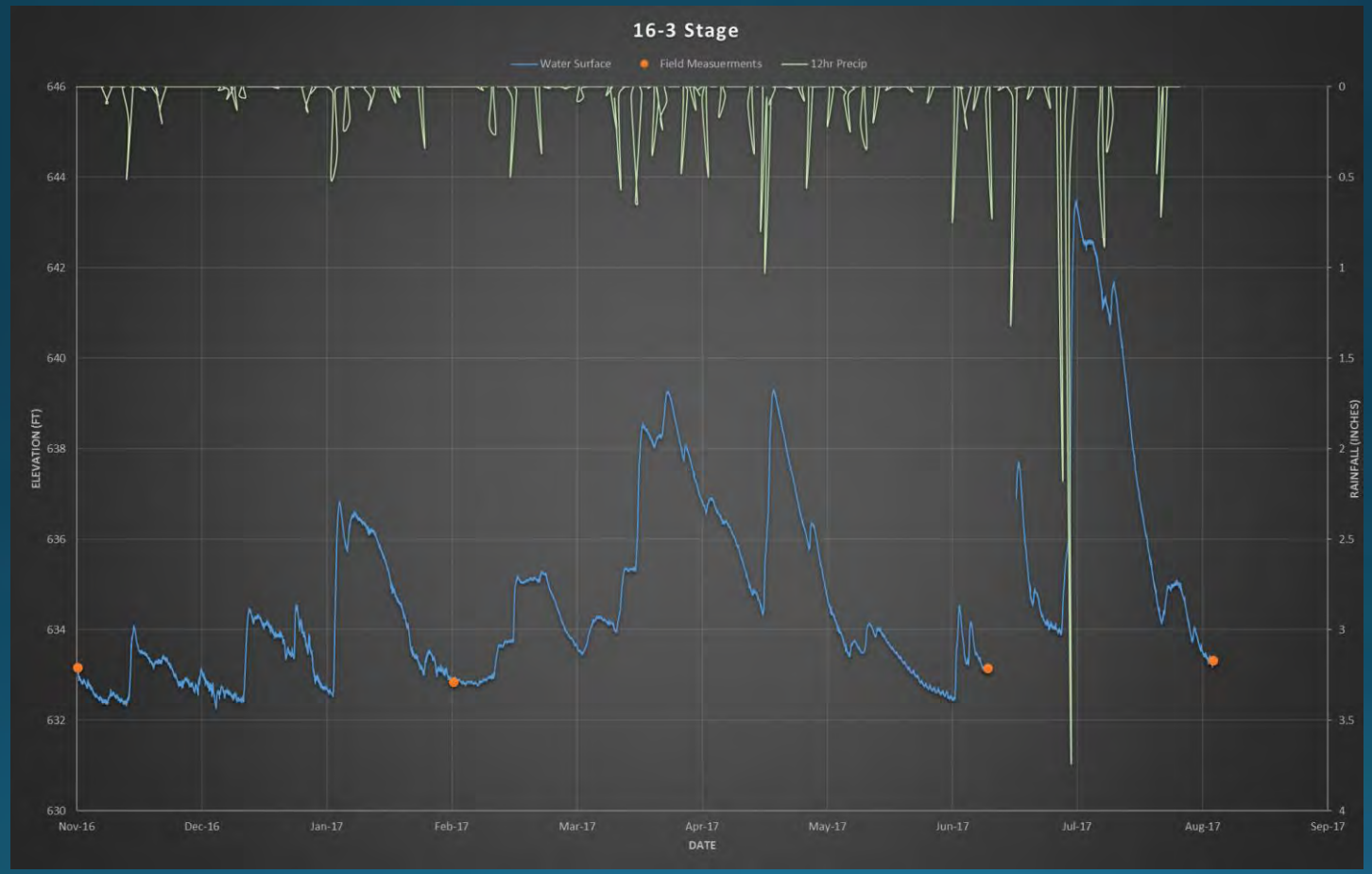


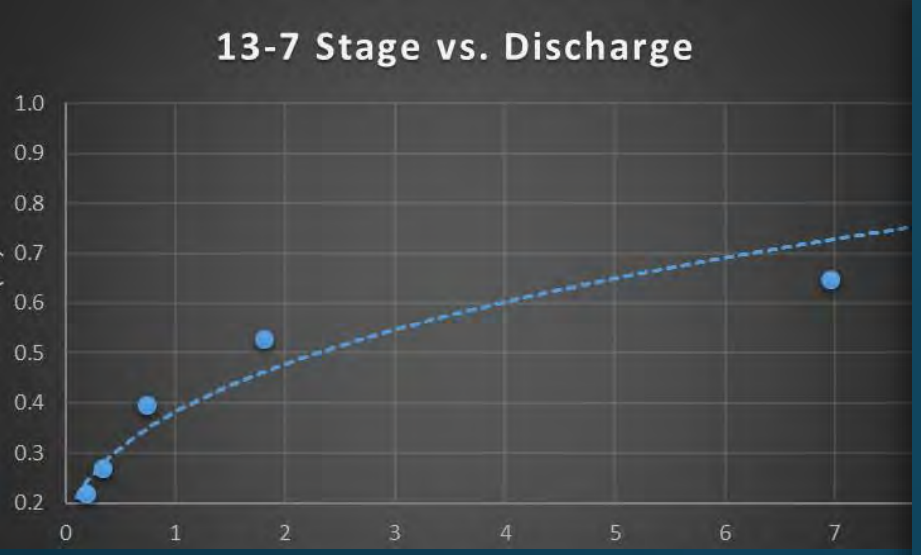




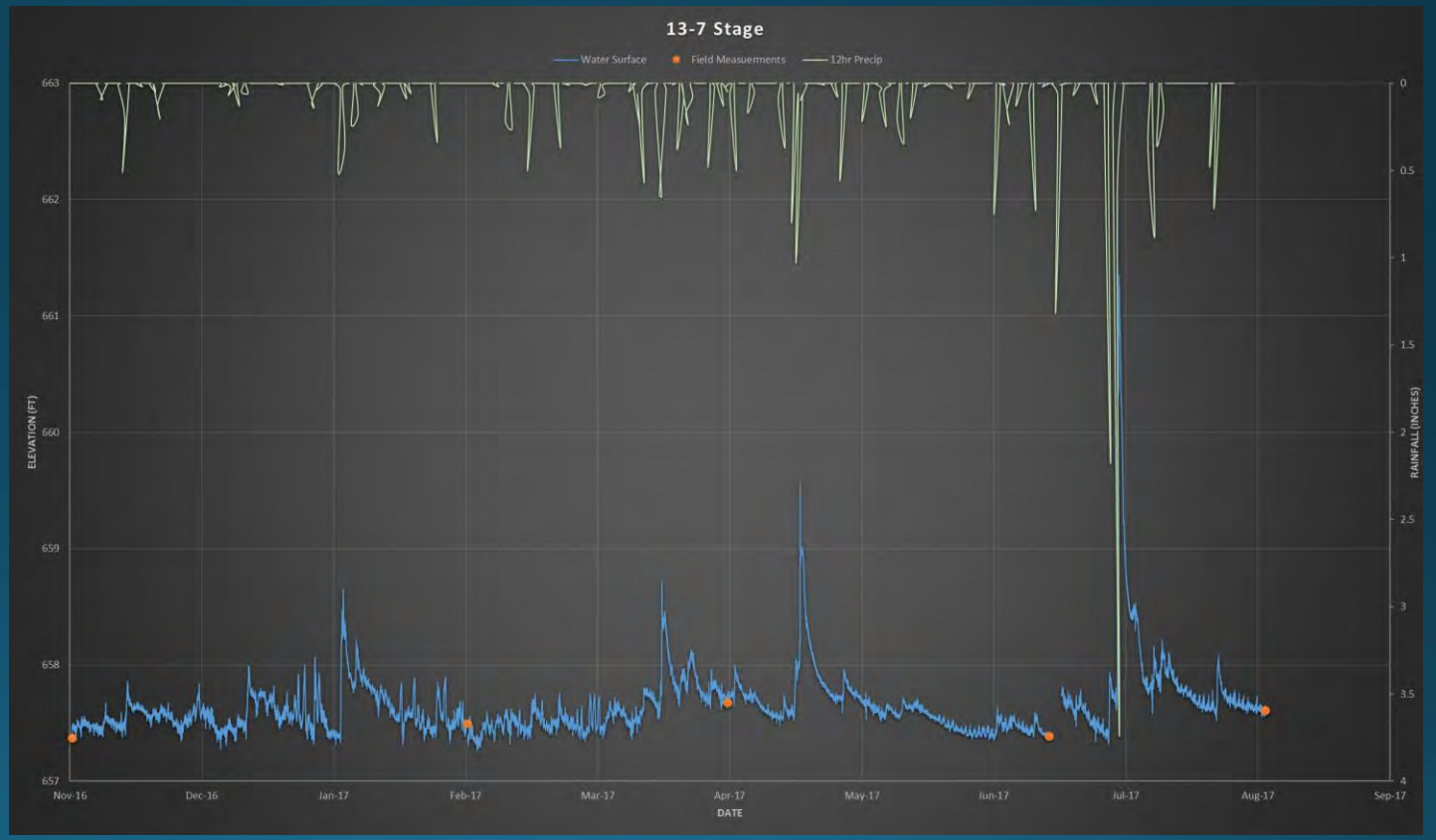
Slocum Creek

Lower Des Plaines River @ Deerfield Rd

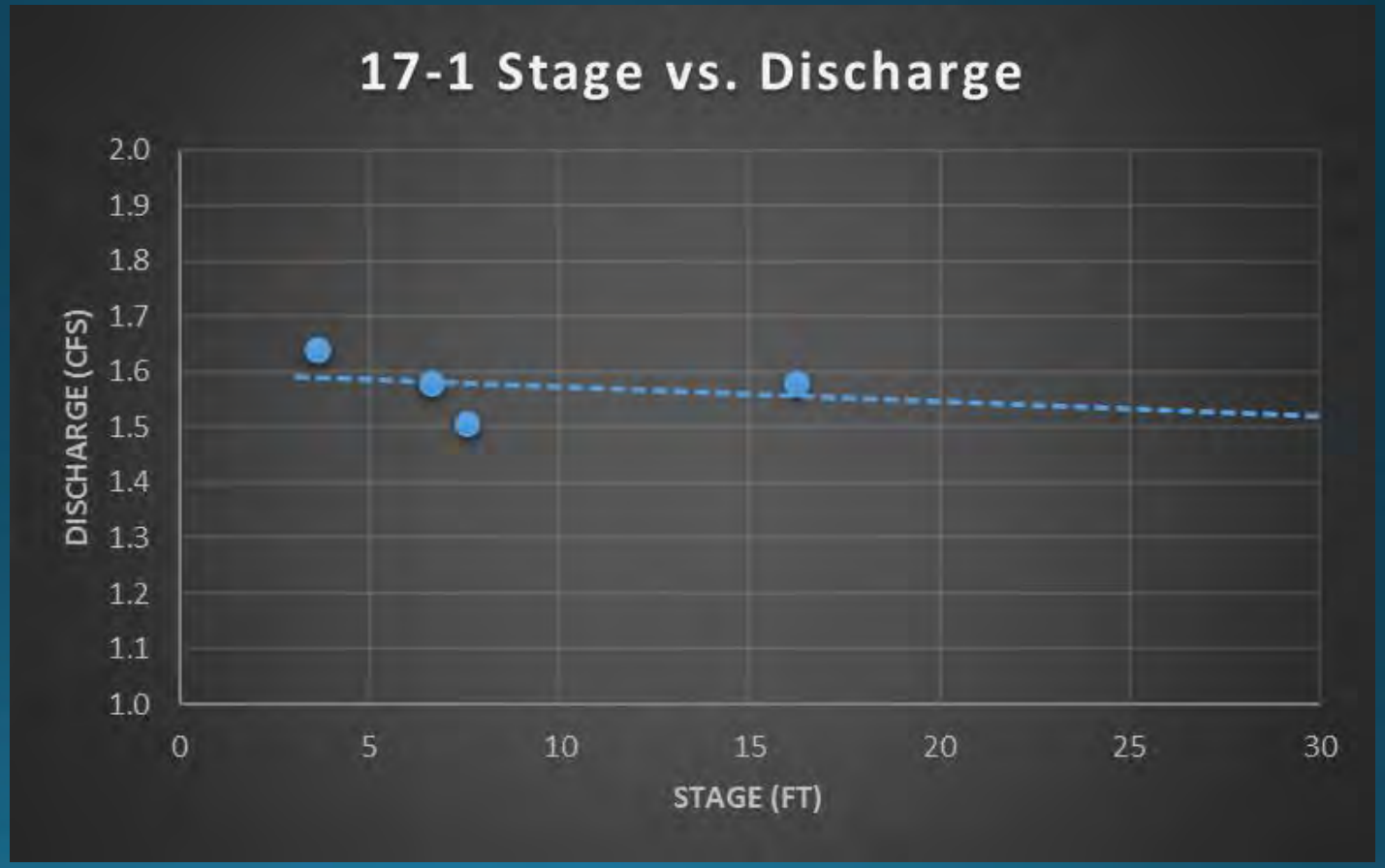



13-7 Stage vs. Discharge
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0
1
2
3
4
5
6
7

Bulls Brook

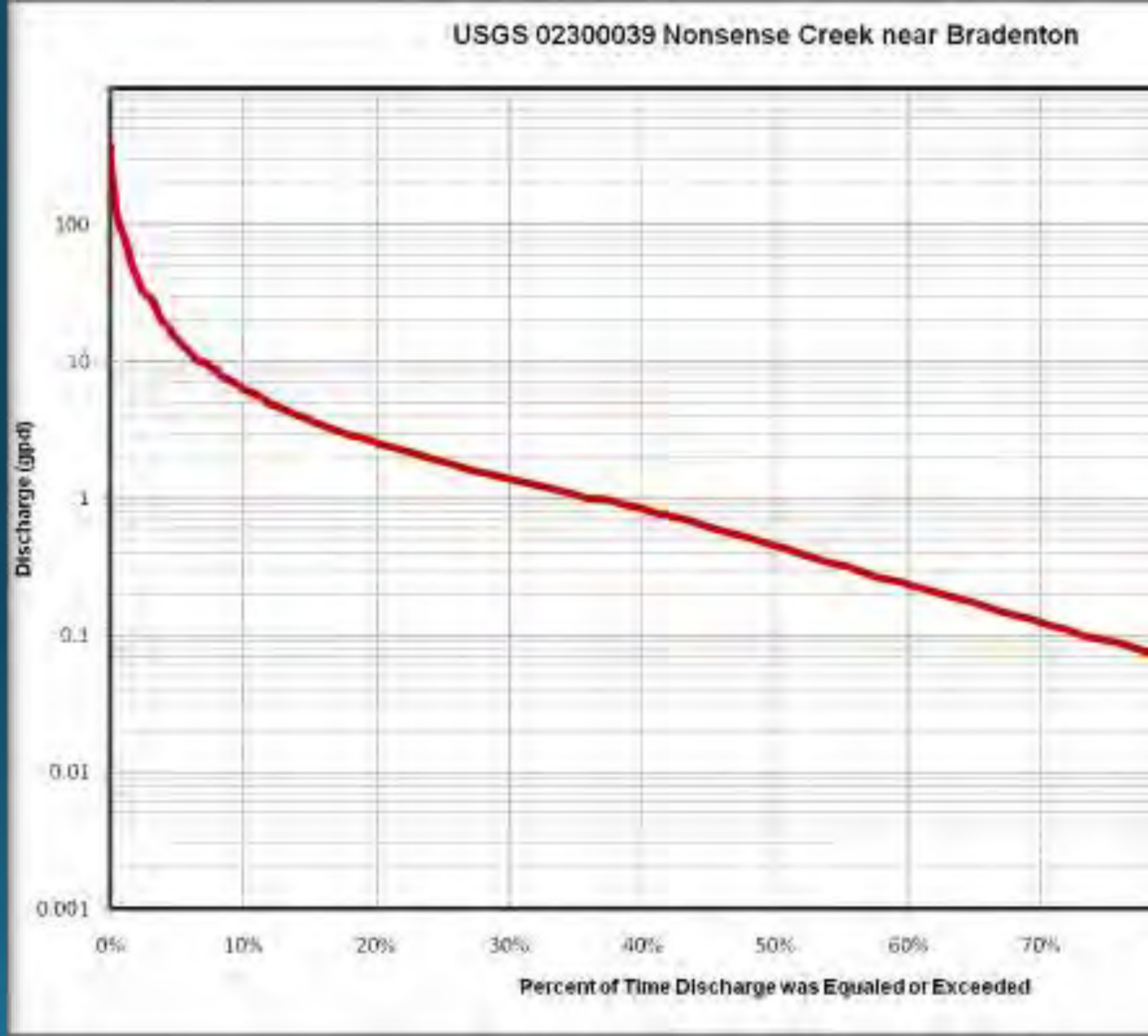

13-7 Stage
Water Surface
Field Measuerments
12hr Precip
663
662
661
660
659
658
657
ELEVATION (FT)
0
0.5
1
1.5
2
2.5
3
3.5
4
RAINFALL (INCHES)
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Apr-17
May-17
Jun-17
Jul-17
Aug-17
Sep-17
DATE

Buffalo Creek



Flow Duration Curve

- % time values met or exceeded
- Daily average discharge rate
- Interpret WQ data
- High, moist, mid, dry, low



Load Duration Curve

- WQ sample @ Stream Flow
- Allowable loading capacity

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