Understanding the Calumet wet-weather system

Weather and Climate

System Response to Rainfall
- Runoff
- Flow Routing

Impact

Rainfall Characterization
- Bulletin 70/71
- NOAA Atlas 14

Historical Events
- Rain gages
- Radar rainfall

Near term Forecasts

Climate Impacts
- downscaled GCMs

Surface Response to Storms
- Soils, imperviousness, previous conditions, local drainage features

Routing of flows
- Chicago area waterways
- Local sewer systems
- Regional drainage infrastructure – interceptors, TARP

Models
- Help quantitatively understand these processes
- System interactions
- All models have limits of applicability

Flood risk – extent and severity of high levels
System bottlenecks

Action

How do potential interventions affect system?
- Do solutions work together?
- What level of protection?
Key questions: to what extent do these models exist? Do they capture the key processes that affect stormwater management across a range of scales? What types of increased understanding would be helpful for planning and prioritizing projects?
Working version

System Interactions

Models

System Issues

Actions
toolkit

0 - not present
- Boundary condition
X - Present but not wholly represented
✓ Included (+, +++, +++++)

Runoff (rate, volume)
Surface flooding (riverine)
Basement backups
CSO, surface flooding (sewer)
Regional capacity
WTP capacity
Availability, inflow

GI, Disconnection (E-I, removal of detention tank)
Storm
Homeowner checkflaw (present, converge)
Operations
A possible future condition...

Integrated Modeling Framework

- Protocols (low-tech)
- Optimization (high-tech)

Rainfall/Climate Scenario Generator

Sensors and Forecasting

Simulation Repository

At-risk Assets

Preparedness

CIP

Operational Optimization

Infrastructure Toolkit

Operational Planning

Regional System(s)

Local Systems

Hyperlocal (Private Property)