NOTICE OF STUDY SESSION

Rain Monitoring Systems

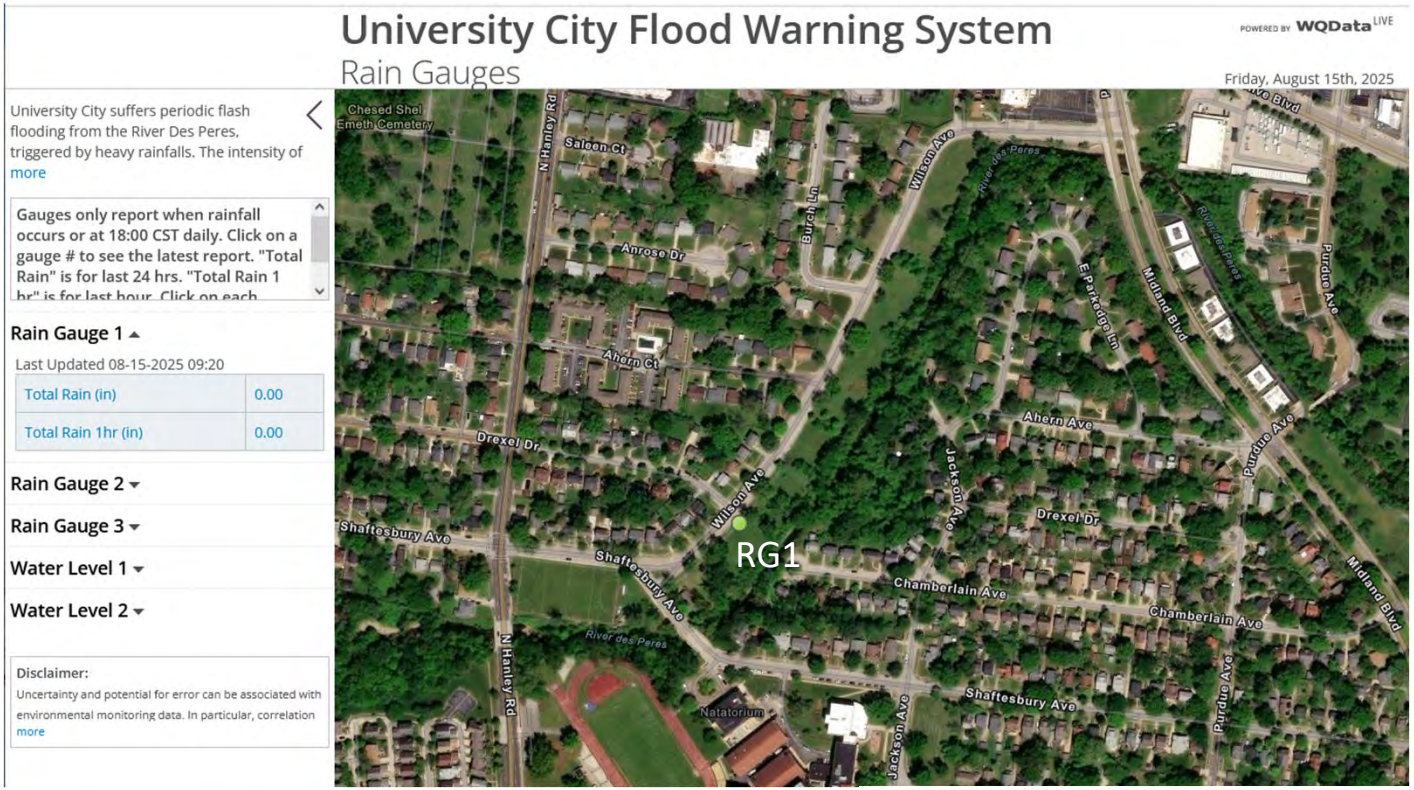
CITY HALL, Fifth Floor
6801 Delmar Blvd., University City, Missouri 63130
Monday, October 13, 2025
6:00 p.m.

AGENDA

1. Meeting called to order
2. Changes to Regular Agenda
3. Presentation regarding Rain Monitoring Systems (Chairperson for Storm Water Commission)
4. Adjournment

The public may also observe via:
Live Stream via YouTube:
https://www.youtube.com/channel/UCyN1EJ_-Q22918E9EZimWoQ

Posted this 10th day of October, 2025.



https://www.wqdatalive.com/public/1473

UCFWS: Current Warning Protocol

Flooding is likely when the 3 rain gauges (RG1,2,3) receive an average of ≥1.5 in/hr
UCFWS immediately issues an alert to Chief Hinson
Chief confirms; Issues public alert on **CODE RED**

Current Monitoring:

3 rain gauges
9 Level Loggers

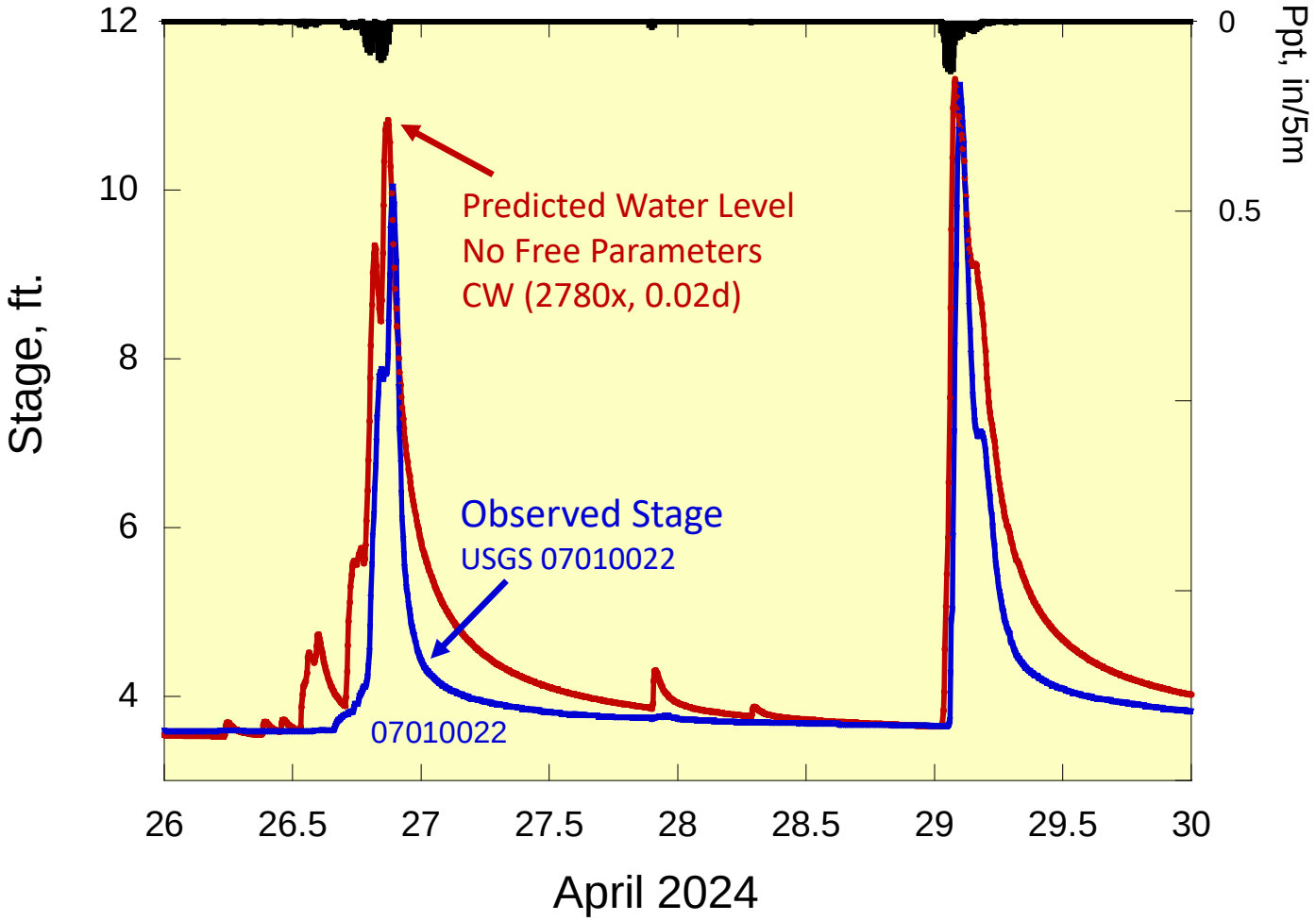
New Capabilities:

2 Radar Level Sensors
4 Webcams
Automated Level Prediction

Geolux Radar
Level Sensor

9 HOBO water level loggers
(not online)

https://www.wqdatalive.com/public/1473


12
10
8
6
4
Stage, ft.
0
0.5
Ppt, in/5m
Predicted Water Level
No Free Parameters
CW (2780x, 0.02d)
Observed Stage
USGS 07010022
07010022
26
26.5
27
27.5
28
28.5
29
29.5
30
April 2024

i-Neighborhood Proposal Phase I and II SWC Monitoring Automation Oct 8, 2025

Early Warning System Summary to Date

The Stormwater Commission, more specifically Dr. Bob Criss and Eric Stein, began creating an early warning system in 2019. Criss analyzed rain gage data provided by MSD and River Des Peres water level data provided by a USGS water level sensor (in Heman Park) and developed an algorithm that correlated river flood levels using rainfall intensity. Because the City did not have rain gages or water level sensors, and MSD would not provide access to real-time rainfall data, this was not an early warning system.

The City funded installation of three (3) rain gages and an online system (Fondriest WQ Data Live) that collects real time rainfall data and delivers an alert to Fire Chief Hinson. This is the state of the current early warning system. It simply issues the alert when the rainfall intensity meets the minimum criteria for major flooding (1.5 inches in 1 hour). It cannot tell the City EMS the actual flood level prediction.

Analysis of data shows that the prediction algorithm is functioning well. It predicts flood levels accurately (erring toward slight over-prediction) and provides at least 30 minutes of warning for large floods. Dr. Criss continues to tweak and improve the algorithm.

While it works well, the system lacks resolution (e.g. not enough water level sensors), USGS water level sensors are slow and do not report in real time, and has no real-time cameras which would give City EMS a visual of the river.

The City provided funding for water level sensors and cameras which are installed and functioning. However, this new equipment is not directly incorporated into the early warning system. Prediction of water level still requires manual input by Dr. Criss. The online (Fondriest WQ Data Live) system is currently incapable of incorporating all of this equipment and data into a single online and real-time system.

Early Warning System – Future Improvement

The Stormwater Commission developed a scope of work to address the identified shortcomings and solicited a proposal from a University City based company (iNeighborhoods). Today we present to you the costs to complete these improvements.

Phase 1	Transfer Fondriest WQ Data to i-Neighbor 4G platform	$7,000 (one time)
Phase 2	Incorporate water level prediction algorithm to report water levels in real time	$7,000 (one time)
Annual fees	For current Fondriest WQ Data Live System and i-Neighborhoods equipment and cell plans	$6,470 (annual)
	Total	$20,470

DETAILED BREAKDOWN

Phase I (RECOMMENDED)

a) Use the WQData LIVE Data API to port data from the SWC Fondriest devices to the iNeighborhoods platform.

b) Use the WQData LIVE Data API to port data from the adjacent USGS rain gauges to the iNeighborhoods platform.

c) Change from 5 minute to 1-minute sampling rate if > SWC rain rate.

d) Change from 1 minute to 5-minute sampling rate if < SWC rain rate.

e) Data would be displayed in numerical or graphical format.

f) Additional yearly cost for the WQData LIVE Data API - $ 950.

g) iNeighborhoods development cost ~ $ 7K.

Phase II (RECOMMENDED)

a) Implement the Bob Cris flood prediction algorithm.

b) Data would be displayed in graphical format.

c) Implement yellow alert status if > SWC yellow alert rain rate.

d) Implement red alert status according to Cris prediction algorithm.

e) iNeighborhoods development cost ~ $ 7K

Additional Code Red Option (DO NOT RECOMMEND AT THIS TIME):

a) Use the CodeRed API to send SWC RdP video and river-weather data alerts directly to resident's phones from the iNeighborhoods platform.

b) SWC phone video and data could be displayed in a simpler format as needed.

c) iNeighborhoods development Cost ~10K

d) Additional cost for CodeRed API access – TBD. CodeRed quotes API services based upon requirements and community size.

Note: This summary is for budgetary purposes only and is subject to change. Monthly support costs extra.

FONDRIEST ENVIRONMENTAL, INC.

Darin Girdler
City of University City
6801 Delmar Blvd.
University City, Missouri 63130
Tel. 314-505-8537

Quote: #155931
Contact: Joseph Davidson
Email: joseph.davidson@fondriest.com
Date: 06/25/25
Expires: 09/23/25

Notes: *WQData LIVE and cellular service renewal for loggers G210084, G210096, & G210097 in project 1473 - University City Flood Warning System. Service period: 7/22/25 to 7/22/26.*

Part #	Manufacturer	Description	Price	Qty	Total
WQData-P-Y	NexSens	WQData LIVE Professional web datacenter service, priced per year	$1,950.00	1	$1,950.00
VZ-25MB-Y	NexSens	Verizon cellular data service with 25 MB monthly allowance priced per year	$360.00	3	$1,080.00

Send Purchase Order To:
Fondriest Environmental, Inc.
2091 Exchange Court
Fairborn, OH 45324
Phone: (888) 426-2151
Fax: (937) 426-1125
Email: customercare@fondriest.com

Subtotal:	$3,030.00
Tax:	$0.00
Shipping:	$0.00
Total:	**$3,030.00**

PLACE ORDER ONLINE

Delivery:
FOB Point: Origin
Freight:
Terms: Net 30 w/ approved credit
Visa, MC, AMEX, Discover
Late Payments: 1.5% interest per month.
3% surcharge for late payments made with credit card

iNeighborhoods
"We Build Smart Cities for the Digital Age, One Neighborhood at a Time"

INVOICE

INVOICE # N/A

6900 Delmar Blvd
St. Louis, MO. 63130
Phone: 314-435-3658

BILL TO:
Attn: Mirela Celaj
Director of Parks and Recreation
Accounts Payable
6801 Delmar Blvd
University City, Missouri 63130

SHIP TO:
DAVID SANDEL
iNeighborhoods
6900 Delmar Blvd
University City, MO. 63130
Phone: 314-435-3658
davidsandel@gmail.com

PROJECT NAME: FLASH FLOOD PLATFORM – *MONTHLY & YEARLY 4G & PLATFORM INVOICE*

VENDOR REFERENCE NO.	PAYMENT TERMS	INVOICE DATE	INVOICE #	QUOTATION #
UCITY-SWC	**N/A**	October 6, 2025	**N/A**	

DESCRIPTION	UNIT PRICE	MONTHLY	YEARLY
3 x Barn Owl Pro Plan	25.00	75.00	900.00
3 x SMS Transmission		2.00	24.00
3 x Data Transmission		70.00	840.00
3 x API	10.00	30.00	360.00
iNeighborhoods Platform	100.00	100.00	1200.00
FEIN 81-3380762			
Subtotal		$ 277.00	$ 3,324.00

ACH DEPOSIT:
Enterprise Bank & Trust
Innovation Neighborhoods LLC
Routing 081006162 Acct 0490012396
6900 Delmar Blvd
St. Louis, MO 63130