

Staff Gages and Field Instrumentation

- St Charles Parish has commissioned many studies and Drainage Plans over the years. Most hydrological work we've had done was supposed to be “calibrated” against a known flooding event. The only calibration that has been provided was input from Public Works field staff. Those were *not* readings taken at various locations in the conveyance system. To make the results of models trustworthy, data for storms must be compared to model output. That is what calibration is.
- In 2021, a map was given with locations of fixed staff gages to an at-large Council rep who met with Public Works. Those shown in the picture below were never installed. However, some locations on West Bank were added by GIS dept very recently. The data read from these gages is critical to proper system analysis.
- In December of 2019, Mr. Terry Breaux presented to the Council a plan to add 28 level transmitter stations that could report live data to the PW Director's office. The locations of these were parish wide, but not identified. Only one that I know of has been installed.
- If SCP obtained RTU levels in real time and reported to the SCADA system, this data could be used to calibrate models and pinpoint trouble within the conveyance systems.



@ N end
Ormond
Oaks
ditch

@ Ditch
1 & Eve
St,
visible

At PS2
bridge, see
exploded

Carriage @
Dunleith
Canals

@ Dunleith
Canal & CN
RR ditch

Canal
outside ring
levee @ CN

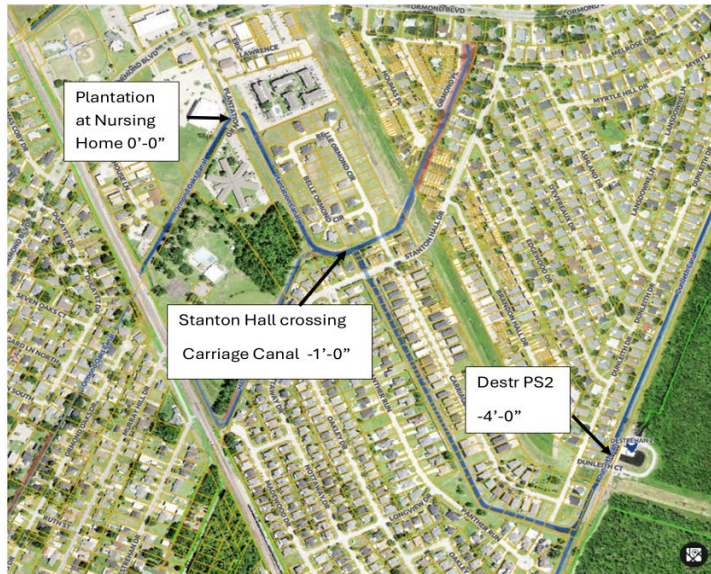
@ 60" culvert
N end of S
Destrehan
ditch from RR

Staff Gages and Field Instrumentation

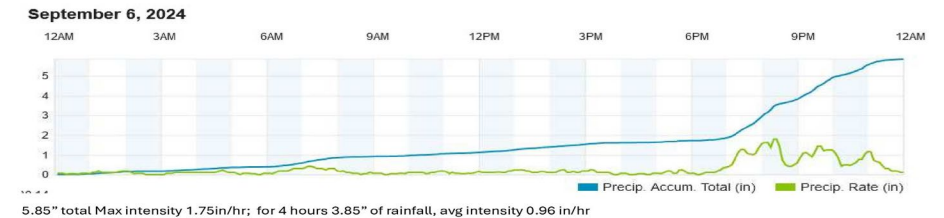
- Additional Technology would be an invaluable drainage diagnostic analysis tool
- Below are examples of field data that can be collected for a given point in time, currently being read manually from existing staff gages
- This data would tell us the grade line of the event. Invaluable to hydrologists and hydraulic Engineers
- The bottom line for reducing flooding is to reduce canal levels downstream – upstream levels lower when that happens
- Knowing the canal water surface elevations vs. an event allows calibration and provides data that to analyze problems and make decisions to fix them!
- It can be shown that rain intensity is the driver of flooding events
- Level data in a conveyance system is a way to pinpoint problems in conveyance
- The data can also provide an indicator of success of an improvement made (see next slides)

Staff gage data collected 9-6-24 - 5.85” total for the day, with 3.85” of that in ~ 4 hrs. That is an avg intensity of 0.96”/hr. This resulted in **4 ft rise** from PS2 to Nursing Home. Note: this was *before* 3 new bays in PS2 were opened, but 2 of 3 old bays were open flowing into 72” pump house window

Sept 6 approx 9:30 PM – data collected in field by Mr. Jewell – sent to W Pille’



KLADISTR31 Bottom of the Bowl Ducauyet Dr



Staff gage data collected 10-4-24

Note: this was *after new bays* in PS2 are open with 3.3” in ~75 min, an intensity of 2.64 in/hr!

From PS2 to Nursing Home resulted in **2.6ft rise**

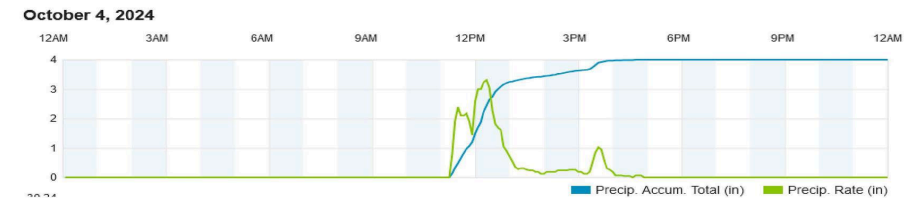
Date 10-4-24 event 4.0" at KLADESTR31 (max intensity

Reading Locn	Time	Gage reading, El ft/in NAVD88	Gage reading, El ft NAVD88	Diff (ft) from downstream site	Notes
Destrehan PS canal	1:25 PM		-4.1		MLJ
Stanton Hall Carriage Canal	1:25 PM	-2' 5"	-2.42	1.68	WEP
Plantation Rd Nursing Home	1:12 PM	-1' 6"	-1.5	0.92	WEP
60" culv at Title Co Storehouse Ln	1:45 PM	-0' 4"	-0.33	1.17	WEP *

Tot Rise (ft) -> 3.77

* Data much later in event - max watermark reading
Note: 2.6ft rise from PS2 to Nursing Home gage

KLADESTR31 Bottom of the Bowl Ducayet Dr



4.00 in total rainfall, but 3" of that came in 1 hr 15 min Max intensity 3.3"/hr

Staff Gage data shows how Destrehan PS2 Sump improvement Project worked

- **Before** new bays at PS2 were operative:
 - 0.96"/hr intensity rain event
 - **4ft rise** from canal inlet at 3 old PS2 intakes to Nursing Home
- **After** new bays at PS2 (total 6 bays) are operative:
 - 2.64"/hr intensity rain event
 - **2.6 ft rise** from canal inlet at 6 new PS2 intakes to Nursing Home
- This data shows the results we got from a significant improvement of our infrastructure – better reduction in hydraulic grade with a more intense storm!
- *The data that we'd get from addition of field level instrumentation would allow smarter decisions to be made in our conveyance and pumping systems = bigger bang for the buck!*

How can we add this instrumentation?

- In-house resources can do it. Argument against - current staff get diverted from critical drainage tasks
- Add staff – Civil Service guidelines a problem once project is complete
- Outsource the effort – Engineering consultants cost higher and management by PW staff burdened
- Partner with a University – not sure of availability and management by PW staff burdened
- Industry donation of technical staff – if possible, this would be the best of all worlds: the community (as well as industry employees) benefit and industry instrumentation personnel could execute the design, procurement, management, and oversight of installation and commissioning. This would be a better benefit to SCP than a check for a park!