



# DATA DOWNLOAD & VISUALIZATION

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INNOVATIVE RESEARCH FOR A SUSTAINABLE FUTURE

# SET UP AN ACCOUNT

- <https://thingspeak.com>
- Internet of Things (IoT) cloud based analytics platform service
- Capture, aggregate, visualize and serve live data streams
- Getting Started:
  - Create an account – a free account is sufficient
  - Create a new channel – a channel corresponds to a deployed sensor package
  - Setup your channel – add your variables and metadata
  - Record your **Channel ID**, **Read API Key**, **Write API Key** and **User API Key**

# SET UP A CHANNEL

ThingSpeak™

Channels ▾ Apps Community Support ▾

How to Buy Account ▾ Sign Out

TEST42

Channel ID: 398167 | Low cost sensor test

Author: wolfe.kurt

Access: Private

Private View

Public View

Channel Settings

Sharing

API Keys

Data Import / Export

Channel Settings

Percentage complete

50%

Channel ID

398167

Name

TEST42

Description

Low cost sensor test

Field 1

Temp[deg.C]

☒

Field 2

pH[S.U.]

☒

Field 3

SpCond[uS/cm]

☒

Field 4

DO[mg/L]

☒

Field 5

DO[%Sat]

☒

Field 6

☐

Field 7

☐

Field 8

☐

Metadata

Tags

(Tags are comma separated)

Link to External Site

https://

Elevation

194 m

Show Location

☒

Latitude

33.923636

Longitude

-83.357501

Show Video

☐

☒ YouTube

☐ Vimeo

Video URL

https://

Show Status

☐

Save Channel

Help

Channels store all the data that a ThingSpeak application collects. Each channel includes eight fields that can hold any type of data, plus three fields for location data and one for status data. Once you collect data in a channel, you can use ThingSpeak apps to analyze and visualize it.

Channel Settings

- Channel Name:** Enter a unique name for the ThingSpeak channel.
- Description:** Enter a description of the ThingSpeak channel.
- Field#:** Check the box to enable the field, and enter a field name. Each ThingSpeak channel can have up to 8 fields.
- Metadata:** Enter information about channel data, including JSON, XML, or CSV data.
- Tags:** Enter keywords that identify the channel. Separate tags with commas.
- Latitude:** Specify the position of the sensor or thing that collects data in decimal degrees. For example, the latitude of the city of London is 51.5072.
- Longitude:** Specify the position of the sensor or thing that collects data in decimal degrees. For example, the longitude of the city of London is -0.1275.
- Elevation:** Specify the position of the sensor or thing that collects data in meters. For example, the elevation of the city of London is 35.052.
- Link to External Site:** If you have a website that contains information about your ThingSpeak channel, specify the URL.
- Video URL:** If you have a YouTube™ or Vimeo® video that displays your channel information, specify the full path of the video URL.

Using the Channel

You can get data into a channel from a device, website, or another ThingsSpeak channel. You can then visualize data and transform it using [ThingSpeak Apps](#).

See [Tutorial: ThingSpeak and MATLAB](#) for an example of measuring dew point from a weather station that acquires data from an Arduino® device.

[Learn More](#)

# DATA DOWNLOAD OPTIONS

- Option One
  - Export data from SD card and import to Excel





# DATA DOWNLOAD OPTIONS

- Option Two

- Export data from ThingSpeak and import to Excel

## Low Cost Sensor Prototype Test

Channel ID: 369424  
Author: ntbarlet  
Access: Public

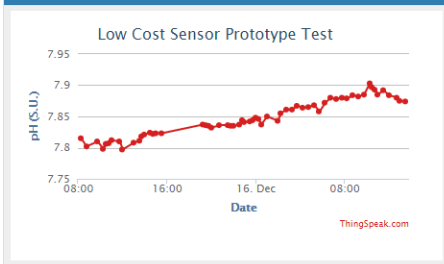
Testing data telemetry via Arduino Mega and  
FONA808

Data Export

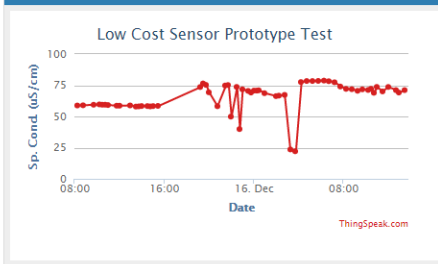
MATLAB Analysis

MATLAB Visualization

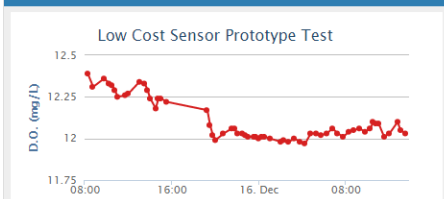
Field 1 Chart



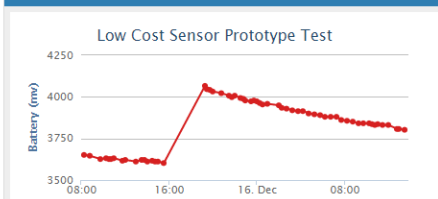
Field 2 Chart



Field 3 Chart



Field 4 Chart



## Data Export

Low Cost Sensor Prototype Test Channel Feed:

[JSON](#) [XML](#) [CSV](#)

Field 1 Data: Temp. (deg. C)

[JSON](#) [XML](#) [CSV](#)

Field 2 Data: pH (S.U.)

[JSON](#) [XML](#) [CSV](#)

Field 3 Data: Sp. Cond. (uS/cm)

[JSON](#) [XML](#) [CSV](#)

Field 4 Data: D.O. (mg/L)

[JSON](#) [XML](#) [CSV](#)

Field 5 Data: Battery (mv)

[JSON](#) [XML](#) [CSV](#)

# DATA DOWNLOAD OPTIONS

- Option Two
  - Export data from ThingSpeak and import to Excel
- Make sure your CSV file is properly formatted with all the relevant field headers defined as:  
**datetime, field1, field2, field3, field4, field5, field6, field7, field8, altitude, longitude, elevation, status**

	A	B	C	D	E	F
1	datetime	field1	field2	field3	field4	field5
2	2017-10-24T09:16:00	19.419	7.399	191	11.75	79.6
3	2017-10-24T09:17:00	19.047	7.483	187.7	11.25	76.2
4	2017-10-24T09:18:00	19.05	7.538	187.8	10.92	74
5	2017-10-24T09:19:00	19.059	7.565	187.6	10.76	72.9
6	2017-10-24T09:21:00	19.083	7.571	187	10.56	71.6
7	2017-10-24T09:22:00	19.106	7.575	186.9	10.35	70.2
8	2017-10-24T09:23:00	19.262	7.578	187.2	10.19	69.1
9	2017-10-24T09:24:00	19.253	7.578	187.1	10.08	68.3

# DATA DOWNLOAD OPTIONS

- Retrieving Data

[https://api.thingspeak.com/channels/398167/feeds.json?api\\_key=Q3SAZ0MGWY86TH64&results=2](https://api.thingspeak.com/channels/398167/feeds.json?api_key=Q3SAZ0MGWY86TH64&results=2)

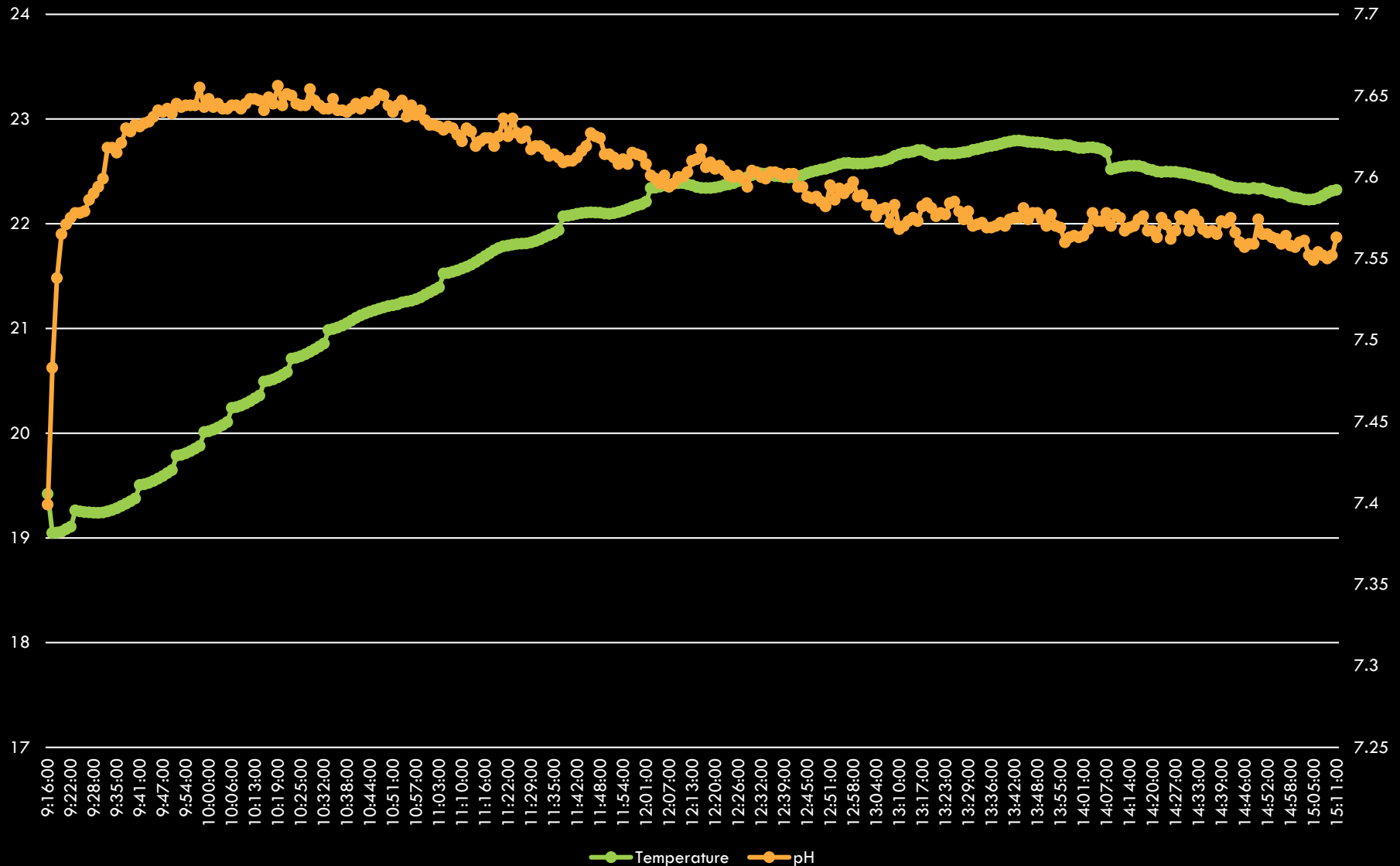
Channel ID

Read API Key

```
{
  "channel": {
    "id": 398167,
    "name": "TEST42",
    "description": "Low cost sensor test",
    "latitude": "33.923636",
    "longitude": "-83.357501",
    "field1": "Temp[deg.C]",
    "field2": "pH[S.U.]",
    "field3": "SpCond[uS/cm]",
    "field4": "DO[mg/L]",
    "field5": "DO[%Sat]",
    "created_at": "2018-01-05T20:08:02Z",
    "updated_at": "2018-01-05T22:14:23Z",
    "elevation": "194 m",
    "last_entry_id": 281
  },
  "feeds": [
    {
      "created_at": "2017-10-24T19:10:00Z",
      "entry_id": 280,
      "field1": "22.312",
      "field2": "7.552",
      "field3": "226.9",
      "field4": "10.5",
      "field5": "71.2"
    },
    {
      "created_at": "2017-10-24T19:11:00Z",
      "entry_id": 281,
      "field1": "22.322",
      "field2": "7.563",
      "field3": "226.9",
      "field4": "10.27",
      "field5": "69.6"
    }
  ]
}
```

# DATA VISUALIZATION

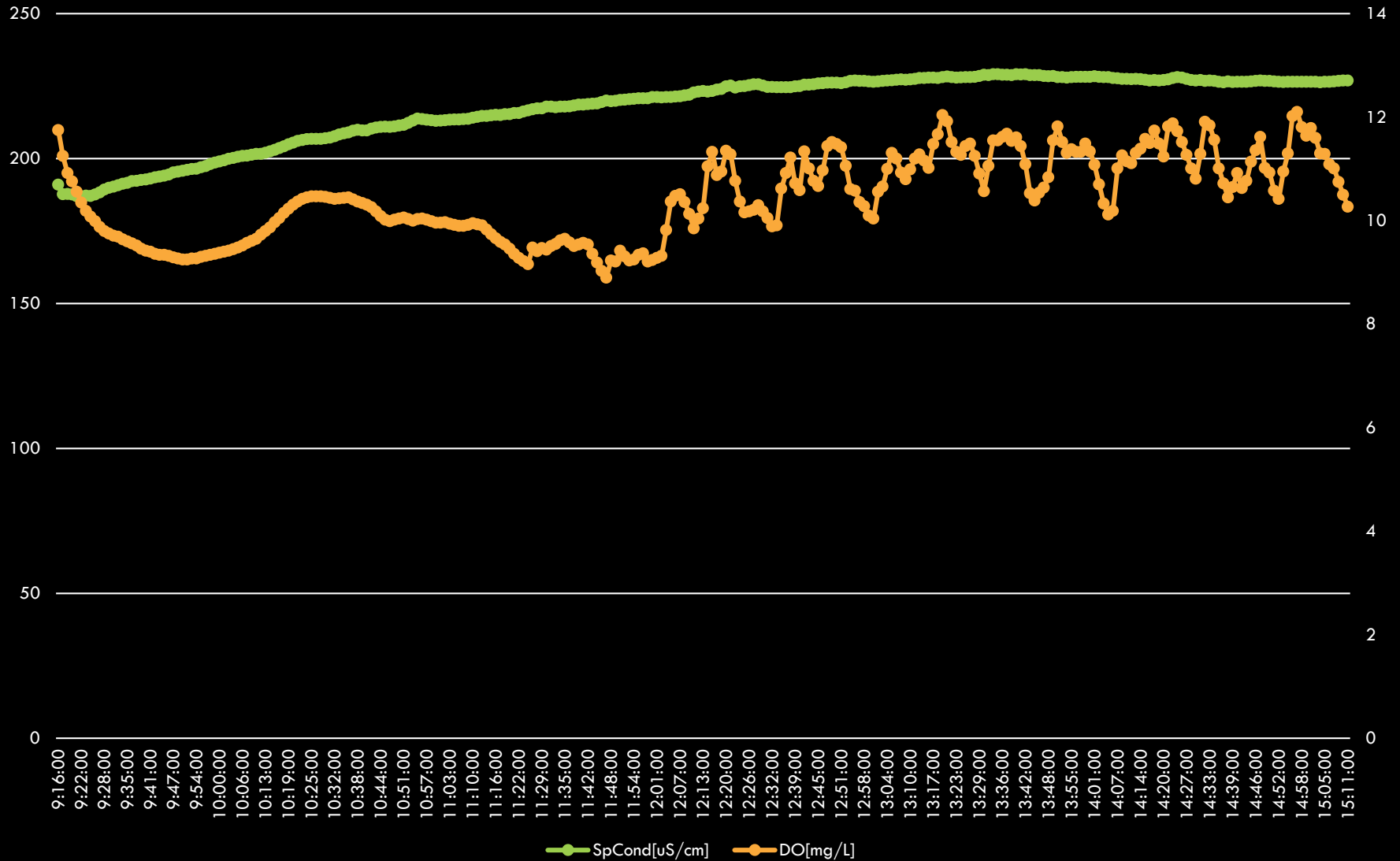
LCS Test October 24, 2017



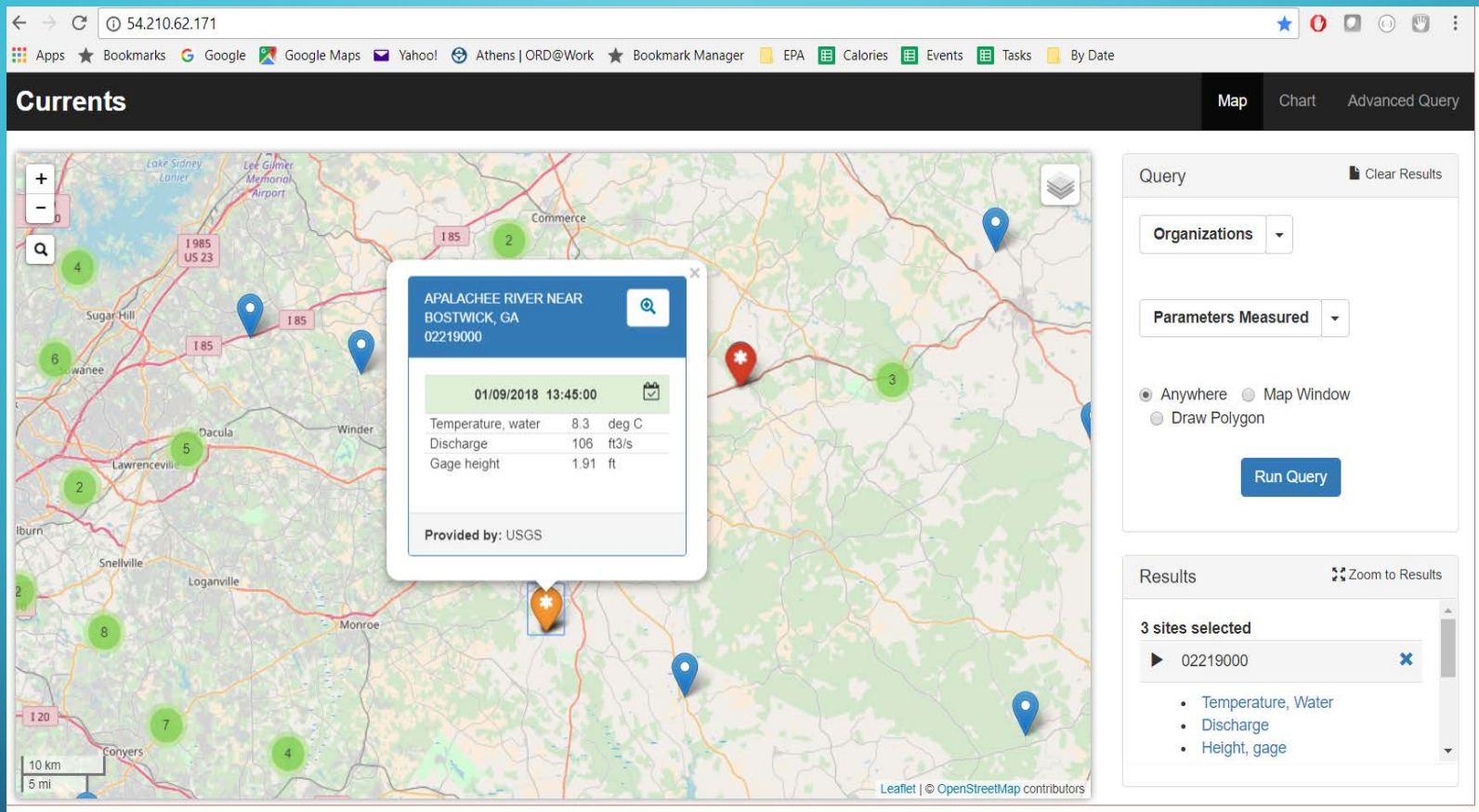


# DATA VISUALIZATION

LCS Test October 24, 2017



# LOOKING TOWARDS THE FUTURE





# DATA DOWNLOAD & VISUALIZATION QUESTIONS



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