

# NEON Operations 2017/2018: Toolik Field Station

National Ecological Observatory Network

A project sponsored by the National Science Foundation and operated under cooperative agreement by Battelle.

### **Outline**

- 2017 overview:
  - Construction activities
  - Sampling activities
- 2018 plans

Questions/suggestions/feedback

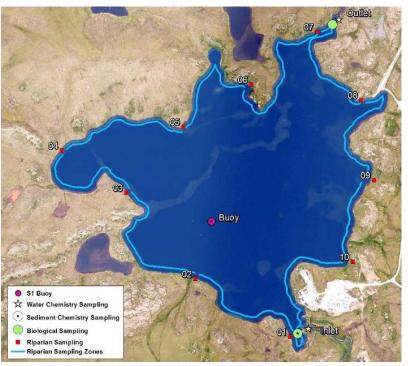
# 2017 overview

## Construction phase complete

- All sites transitioned to operations!
- Aquatic Instrumentation System (AIS):
  - 3 sensor sets at Toolik Lake: Buoy and inlet/outlet sensors deployed late June, removed late September
  - 2 sensor sets at Oks Creek with power hut, also removed for winter
  - Toolik Lake met station running and maintained bi-weekly by TIS technicians
  - GWW drilled and installed at Toolik Lake and Oks Creek
- Terrestrial Instrumentation System (TIS):
  - Tower instrumented and running since 2016
  - Adjustments made to boardwalk
  - Generator Module operational frequent maintenance, additional spill prevention measures, no major issues
- Boardwalk installed at all targeted plots, except GWW
- Terrestrial plots finalized and established



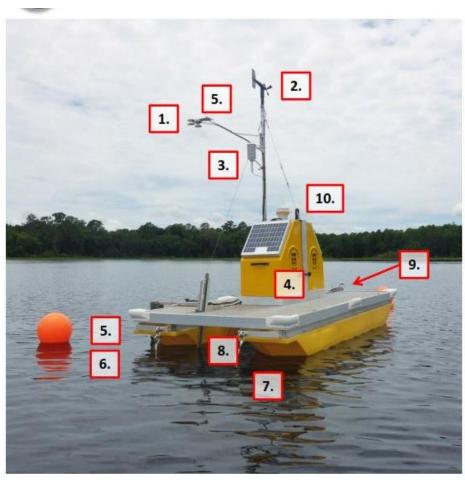
## AIS – Toolik Lake

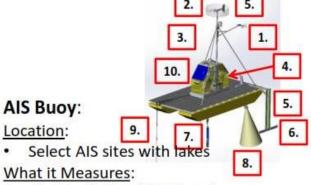






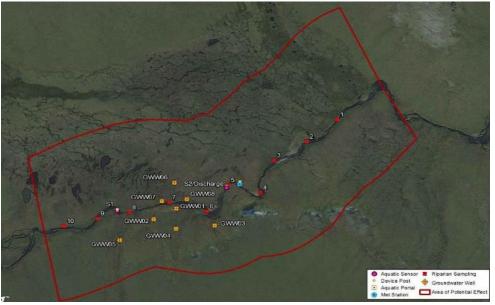
### AIS – Toolik Lake





- Net Radiation (NR01) and Photosynthetically Active Radiation (PAR)
- Wind Speed and Direction (R.M. Young Wind Monitor)
- 3. Temperature and RH (HMP-155)
- 4. Barometric Pressure
- Upwelling and Downwelling Underwater PAR
- 6. Ultraviolet Nitrate Analyzer (Suna V2)
- 7. Exo 2 Sonde
- 8. Depth Sounder
- 9. Temperature Profile (T-Chain)
- 10. HMR3300 Digital Compass and a Garmin 16-HVS GPS Receiver

# AIS – Oks Creek







## AIS – Oks Creek



#### In Stream Sensors

#### Include:

- Level-Troll 500 Sensor
- Exo 2 Sonde
- SUNA
- Kipp and Zonen PQS 1 PAR Sensor
- PRT

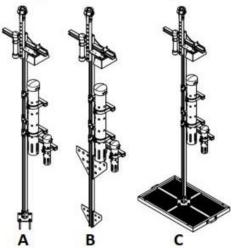
#### Infrastructure:

- Sensors are mounted to Unistrut frame
- The frame can be installed with several foundations for different ground conditions,

such as:

- Bedrock (A)
- Sand (B)
- Cobbles (C)





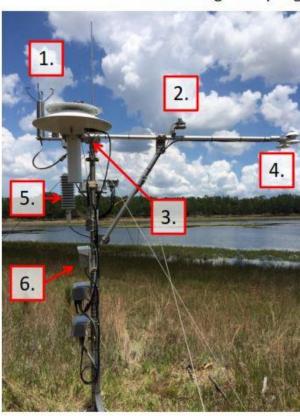
### AIS – All sites



#### **AIS Met Station**

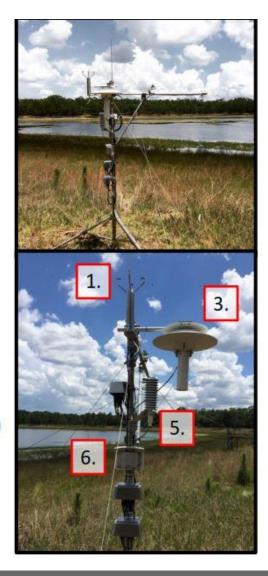
#### Infrastructure:

- Campbell Scientific CM110 stainless steel tripod
- Designed to be installed over rough/uneven terrain
- Stabilized using multiple guy wires



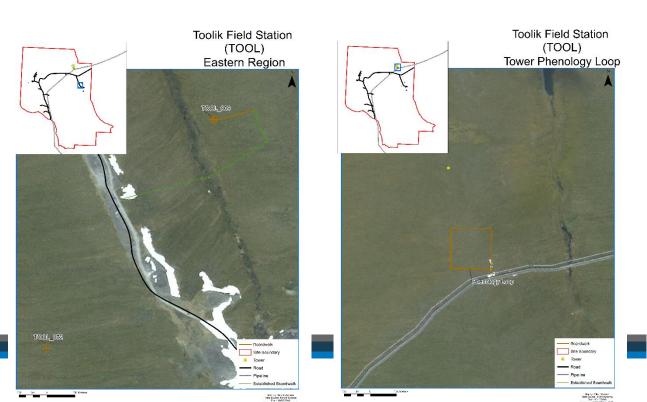
#### Sensors:

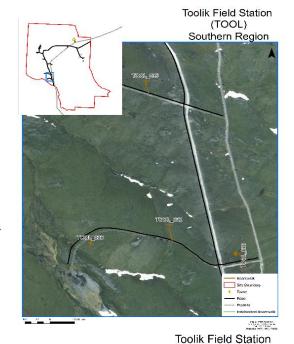
- 2-D Wind Speed and Direction
- Photosynthetically Active Radiation
- Aspirated Air Temperature
- Net LW and SW Radiation
- 5. Relative Humidity (RH)
- 6. Barometric Pressure

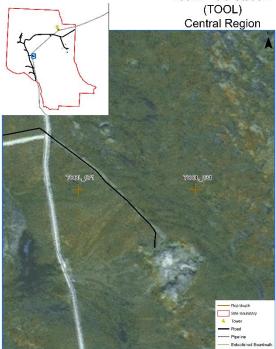


## **Boardwalk installation**

- 3 tower plots & phenology loop
- 10 distributed plots; 5 w/access boardwalk

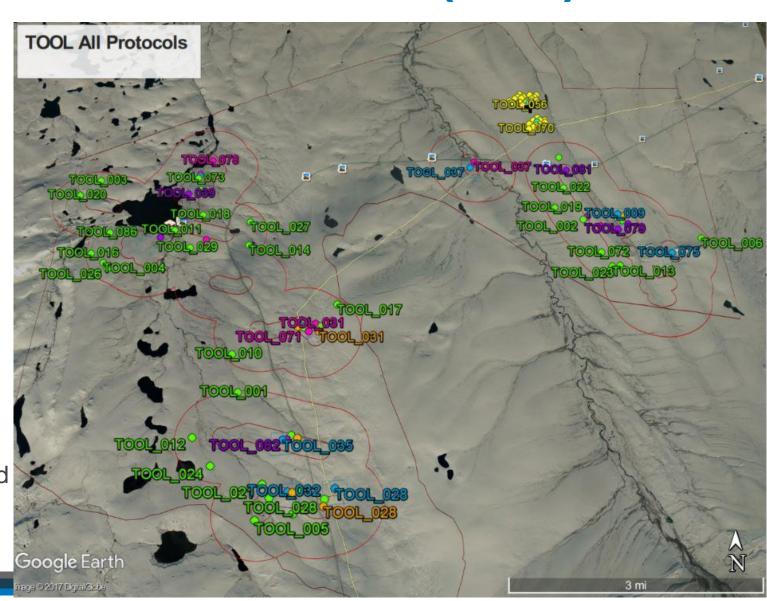






# **NEON Terrestrial Plots (TOS)**

- 30 Distributed
- 30 Tower
- 10 Beetle
- 10 Mosquito
- 8 mammals
- 6 Tick
- 2 Phenology
- Establishment was completed



# Sampling activities

- Terrestrial sampling:
  - 1st terrestrial sampling season July 10 Oct 17
  - Couple highlights:
    - Very low mammal captures: 3 voles, 2 shrews
    - Last mosquito caught in early October

#### Aquatic sampling:

- 2<sup>nd</sup> season
- Core team sampling from early-June to mid-September
- 1st time fishing at Toolik Lake. No fishing at Oks Creek
- Bathymetry completed at Toolik Lake







# 2018 plans

# 2018 projected schedule

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# **Terrestrial (TOS/TIS)**

- Earlier start than 2017 core crew in Toolik ~May 29th
- Pre/post season mosquito observations. Help from EDC?
- 3 mammal trapping efforts: June, July, August
- Peak season: early July to early August Diversity, herbaceous clip, bryophyte, soil
- Bi-weekly year-round schedule for TIS



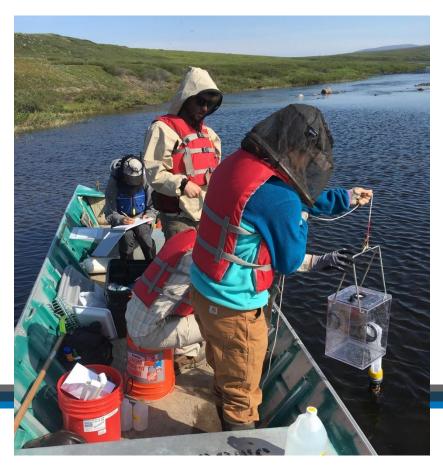
### **Contracted TOS work - TBD**

- Not captured in our schedule
- Bird work contract pending effort to take place after mid-June
- Soil sampling by NRCS: tentatively planned for mid to late August for max thaw depth
  - 1mx1mx1m holes at 19 plots
  - Collection of 700-1000g of soil from each horizon
  - ~6 people, 1 week



# **Aquatics (AOS)**

- Broadly divided into biology and chemistry
  - 3 biology bouts at each site
  - 2 fish bouts at each site
- 2 seasonal core techs + FTT support from Fairbanks

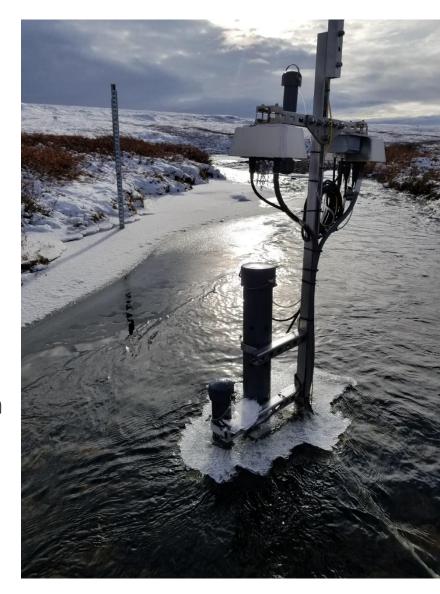






# **Aquatics (AIS)**

- Oks Creek:
  - Stream sensors and met station installation as soon as creek is thawed ~mid to late May.
  - Removal by mid-September.
- Toolik Lake:
  - Inlet and outlet sensors and buoy at Toolik Lake installation late June.
  - Removal by mid-September.
  - Sensor refresh on Toolik met station planned in spring.
- All instrumented sites will be maintained on a bi-weekly basis.
- GWW: trolls to be installed after thaw



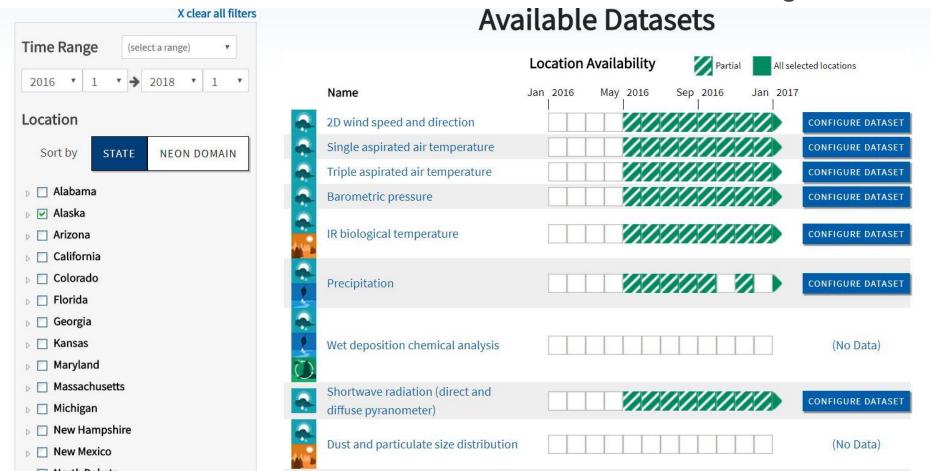
## **Airborne Observations Platform (AOP)**

- DHC-6 Twin Otter flight scheduled between July 6-July 28
- Remote sensing instruments:
  - imaging spectrometer
  - waveform light detection and ranging instrument (LIDAR)
  - instrument and a high-resolution digital camera
- ~380km2 will be surveyed over tower airshed and distributed plots, representative vegetation types, and watershed boundaries for both the terrestrial and aquatics sites.



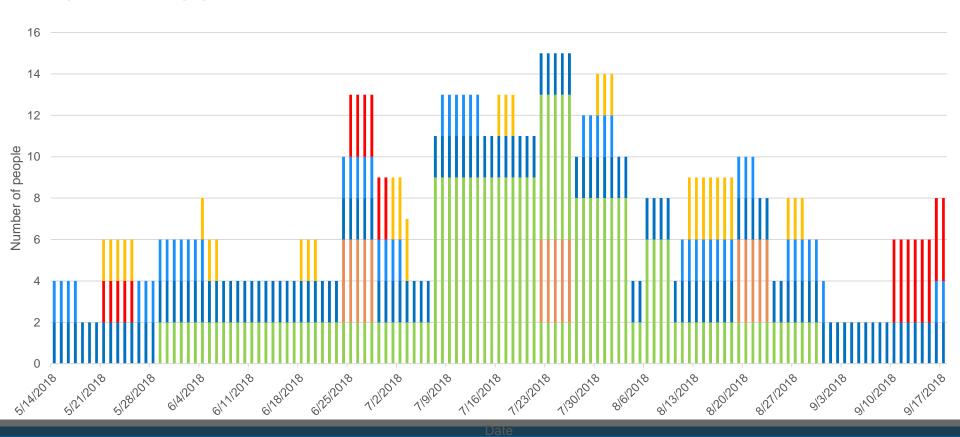
## **Data portal**

- Free and open-access automated instrument, observational and remote sensing data.
- Collects specimens and samples that complement automated measurements and observations on the ground.



# 2018 projected housing needs

- AOS/TOS/TIS/AIS: ~940 user days mid-May to mid-September
- Earlier TOS start in 2018
- Similar AOS activities



# Questions? Suggestions? Feedback?

Thank you