NEON Initial Operations: 2018 & 2019

Toolik Field Station Steering Committee

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1/31/2019

Outline

Infrastructure

- Boardwalk
- Generator & Tower

Field sampling

- Terrestrial
- Aquatic & Aquatic Instrumentation redesign
- Aerial

2019 Plans



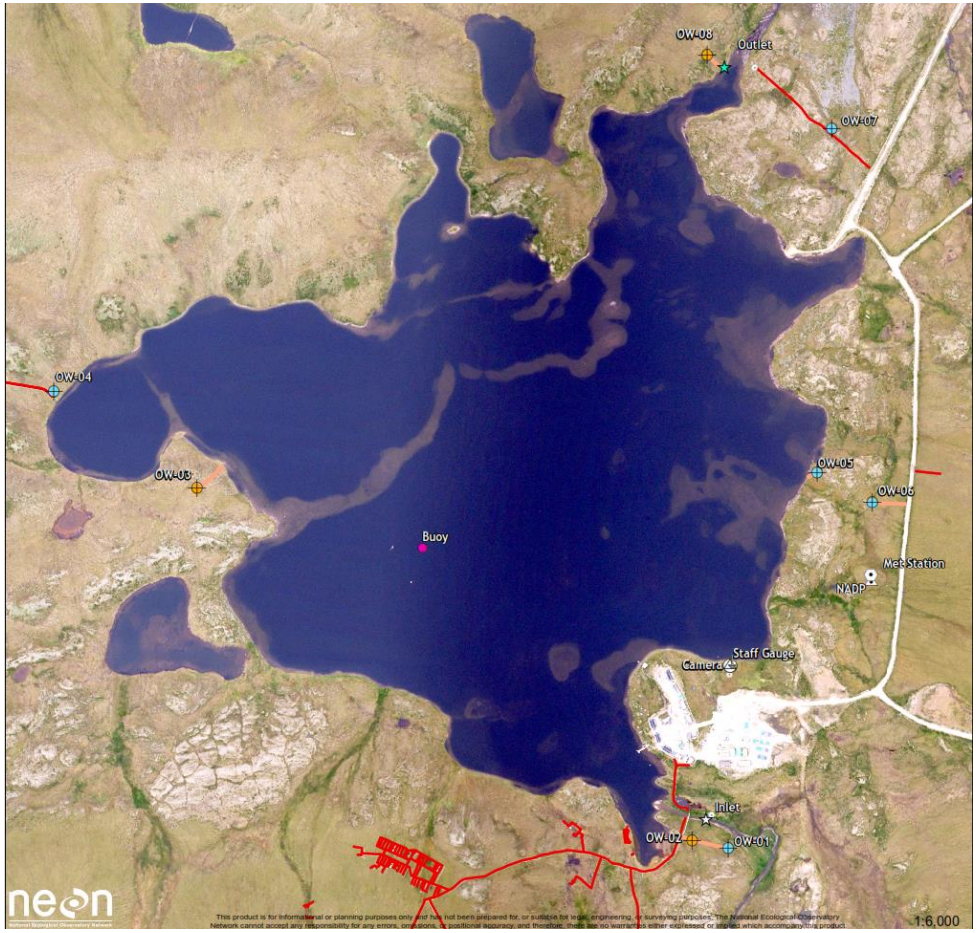





NEON Boardwalk

Boardwalk construction 2018

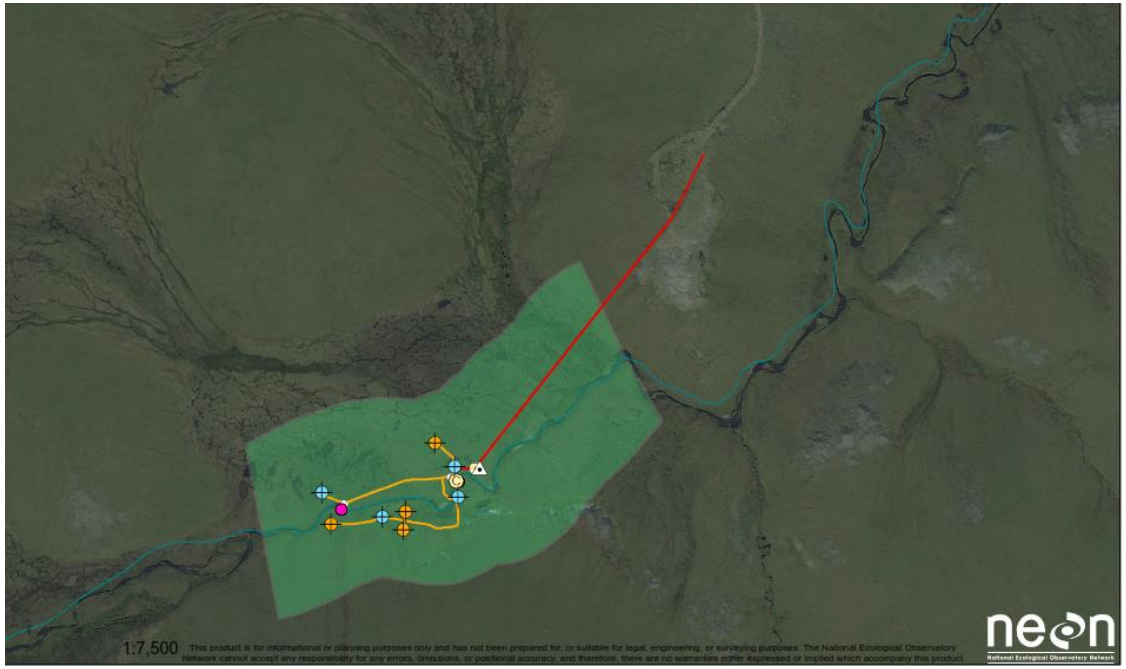
- Toolik lake
  - 8 Ground water wells (1,127ft)



NEON Boardwalk

Boardwalk construction 2018

- Toolik lake
  - 8 Ground water wells (1,127ft)
- Oksrukuyik Creek
  - 8 ground water (2,917ft)



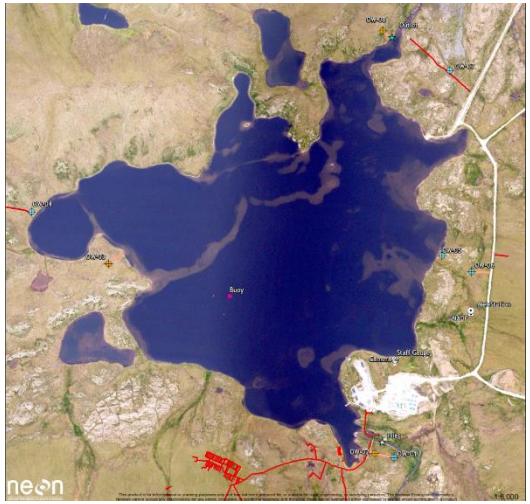
NEON Boardwalk

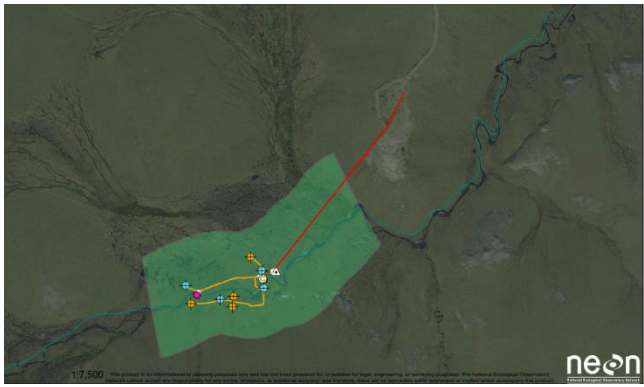
Boardwalk construction 2018 (PFS)

- Toolik lake
  - 8 ground water wells (1,127ft)
- Oksrukuyik Creek
  - 8 ground water (2,917ft)

- **Total NEON Boardwalk**
  - 14 Terrestrial plots and access (8,424ft)
  - Oksrukuyik Creek (5,942ft)
  - Toolik lake (1,127ft)

Total = 15,493ft





NEON Generator

Current projects Powered:

- NEON Flux Tower
- NOAA Met station

Fuel

- 4 Fuel deliveries annually from Prudhoe Bay
  - 14,271gal. Diesel

Maintenance

- Managed by Toolik Science Support
- Additional containment and remote monitoring coming soon
- Plow purchased and donated to TFS

2018 Field observations

Tower

Preventative maintenance

- 21 maintenance bouts performed
- Tower and soil array instrument refresh Aug. 12 - 15
- Heaving soil sensors

Corrective Maintenance

- DFIR fence modified to limit snow drifting
- Waterford professional tower inspection (August)
- Soil sampling 8/5 – 8/9
- Terana

2018 Field observations

Terrestrial

Season bounded by phenology

- Plant & Mosquito phenology, Beetles, Ticks, LAI
- Core crew: 81days 6/4 – 8/24
- First Mosquito 5/22/18; last mosquito 9/14
- First active plant 5/30; Last active plant 10/10

Roving crews

- Small mammals; 6/14, 7/23, 8/20
- Plant diversity & herbaceous biomass 7/8 – 7/27
- Soil sampling 8/5 – 8/9

5yr protocols next in 2022

2018 Field observations

Aquatics

Toolik Lake

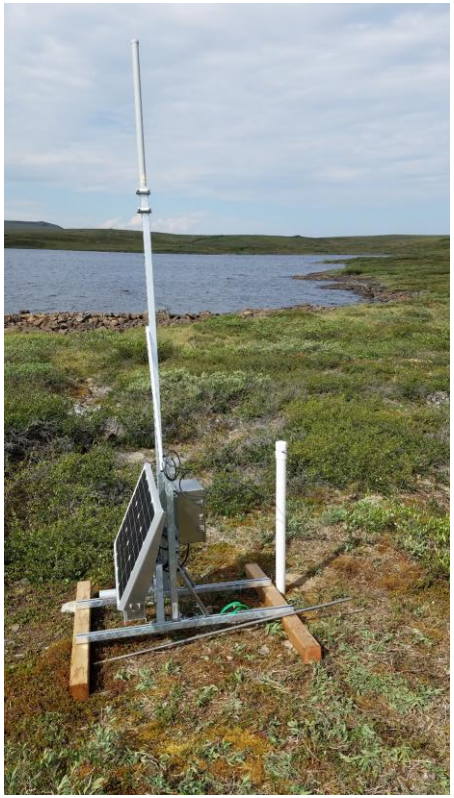
- **Surface Water Chemistry**
  - Year-round
  - Wells: 9/4
- **Lake biology**
  - 3X
  - Fish 2x
- **Sensors**
  - Met: Year-round
  - Buoy: 7/11 – 9/17
  - In-stream: no install

Oksrukuyik Creek

- **Surface water chemistry**
  - Weekly during ice-off
  - Wells: 8/17
- **Stream biology**
  - 3x
  - Fish Canceled
- **Sensors**
  - Met: 5/14 – 9/24
  - In-stream: 7/13 – 9/2 (S1)

2018 Field observations

Aquatics: well redesign



Winter 2017: Initial installation

August 2017: Heaving and Freezing

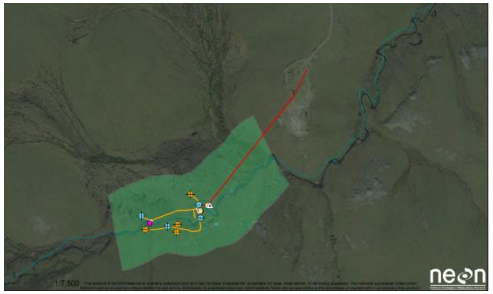
Winter 2018: Redesign

Summer: 2018: LTER method adopted

Toolik Lake: 5 of 8 wells moved

Oksrukuyik Creek: 4 of 8 wells moved

2018 Aquatic infrastructure



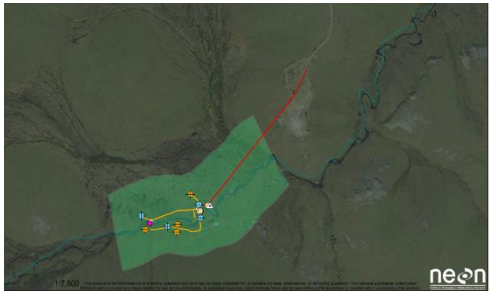
Oksrukuyik Creek

BEFORE

- Instream sensor set (PRT, PAR, SONDE, SUNA, Aqua Troll)
- Staff gauge
- Phenocam installed 2017

2018 Aquatic infrastructure challenges

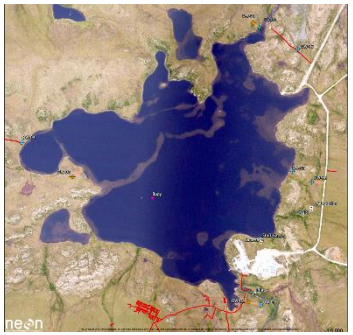
Oksrukuyik Creek



AFTER

- Instream damage 6/1 to staff gauge, and sensor device post during ice-off
- Repaired 8/8 with new removable basket design
- Sensor post and camera washed out 9/1 during high flow event
- New Design process kicked off this month – ideas?

2018 Aquatic infrastructure



Toolik Lake

Before

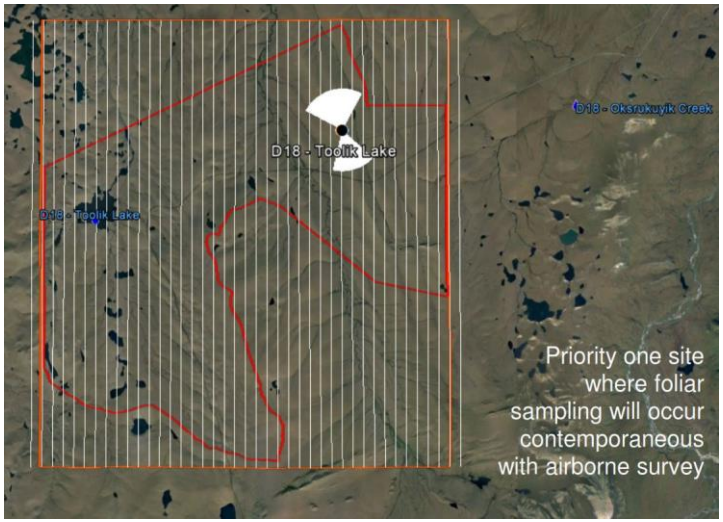
- Sensors: uPAR, level troll
- Instream damage 6/1
- Straightened 8/8, bent again 9/12

AFTER

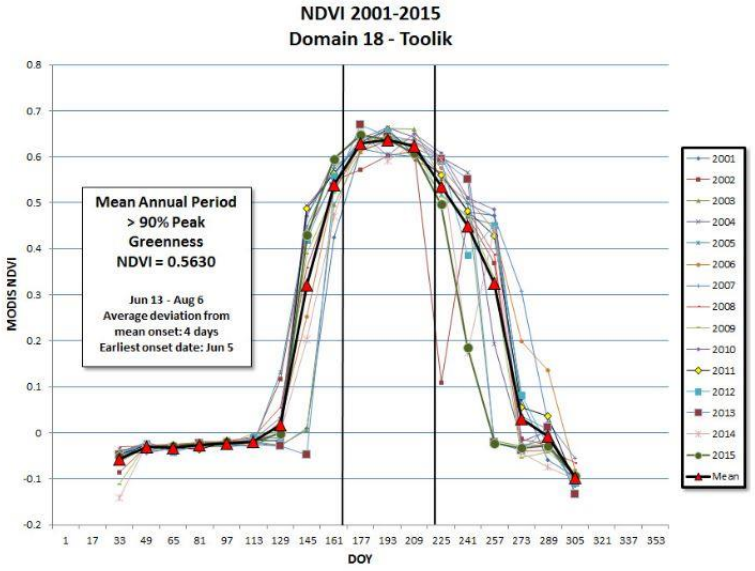
- 2019 plans: remove post
- Add staff gauge & level troll near bank
- Add uPAR to existing post in lake behind generator hut
- Add staff gauge at outlet discharge location

Aerial Observations

- 1m Hyper spectral spectrometry
- ~4ppm LiDAR
- 10cm High Res digital photographs



- 2018 Flight dates 7/2 – 7/25
  - Red level data collected
- 2019 Flight dates 6/22 – 7/14



2019 Plans

- Terrestrial Sampling similar to 2018
- Aquatic Sampling consistent with 2018
  - Add stream geomorphology
- Tower Maintenance continued bi-weekly
  - Toolik Science Support assist with occasional site inspections
  - Continue monitoring tower lean
  - Optimize
- Aquatic Instrumentation redesigns
  - Toolik lake inlet and outlet,
  - Oksrukuyik Creek sensor-set 2
  - Add over-winter temp chain

neon
Operated by Battelle

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