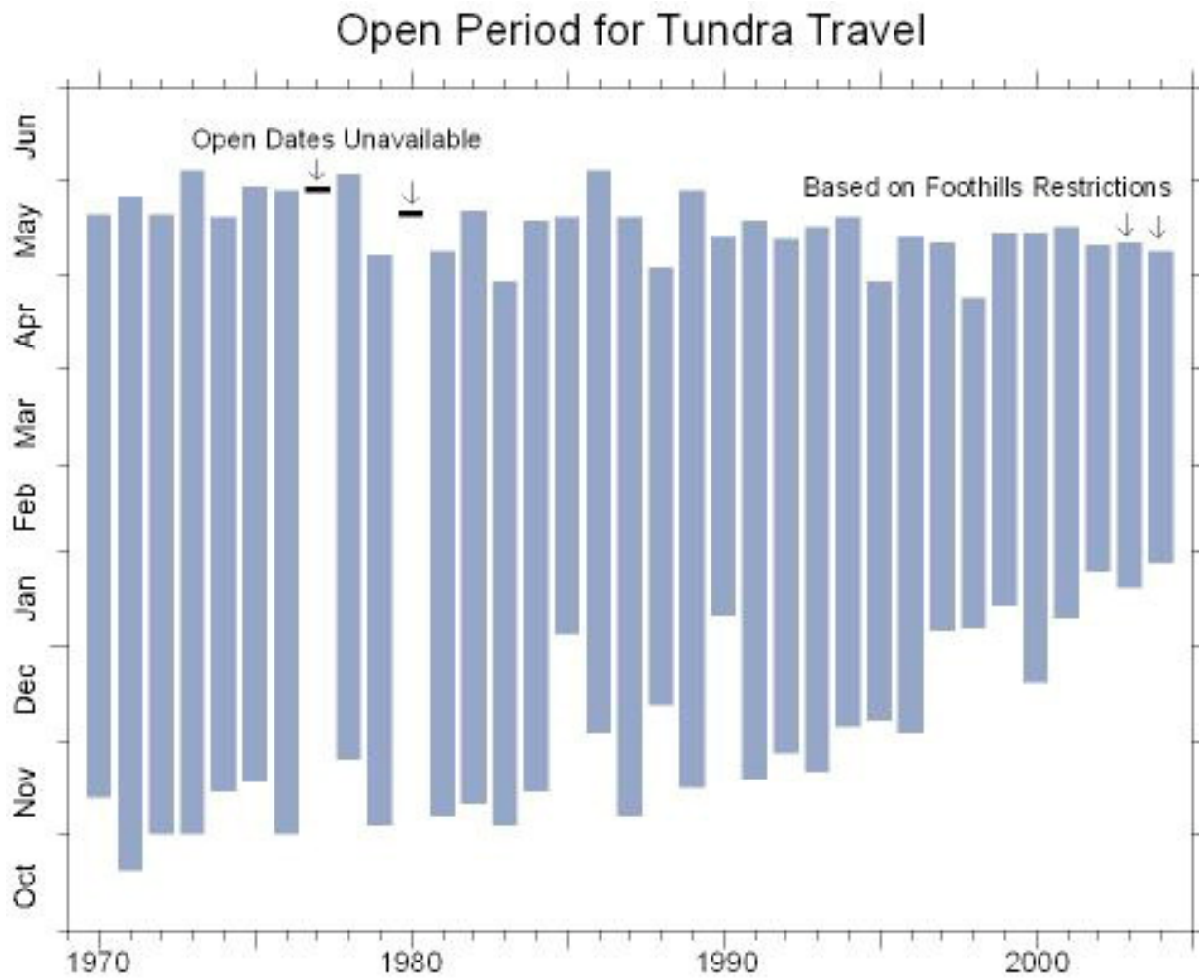
Arctic Hydrologic and Ecological Research Near Toolik

Michael Gooseff - Penn State University

Alaska's changing seasonality, extending Autumn

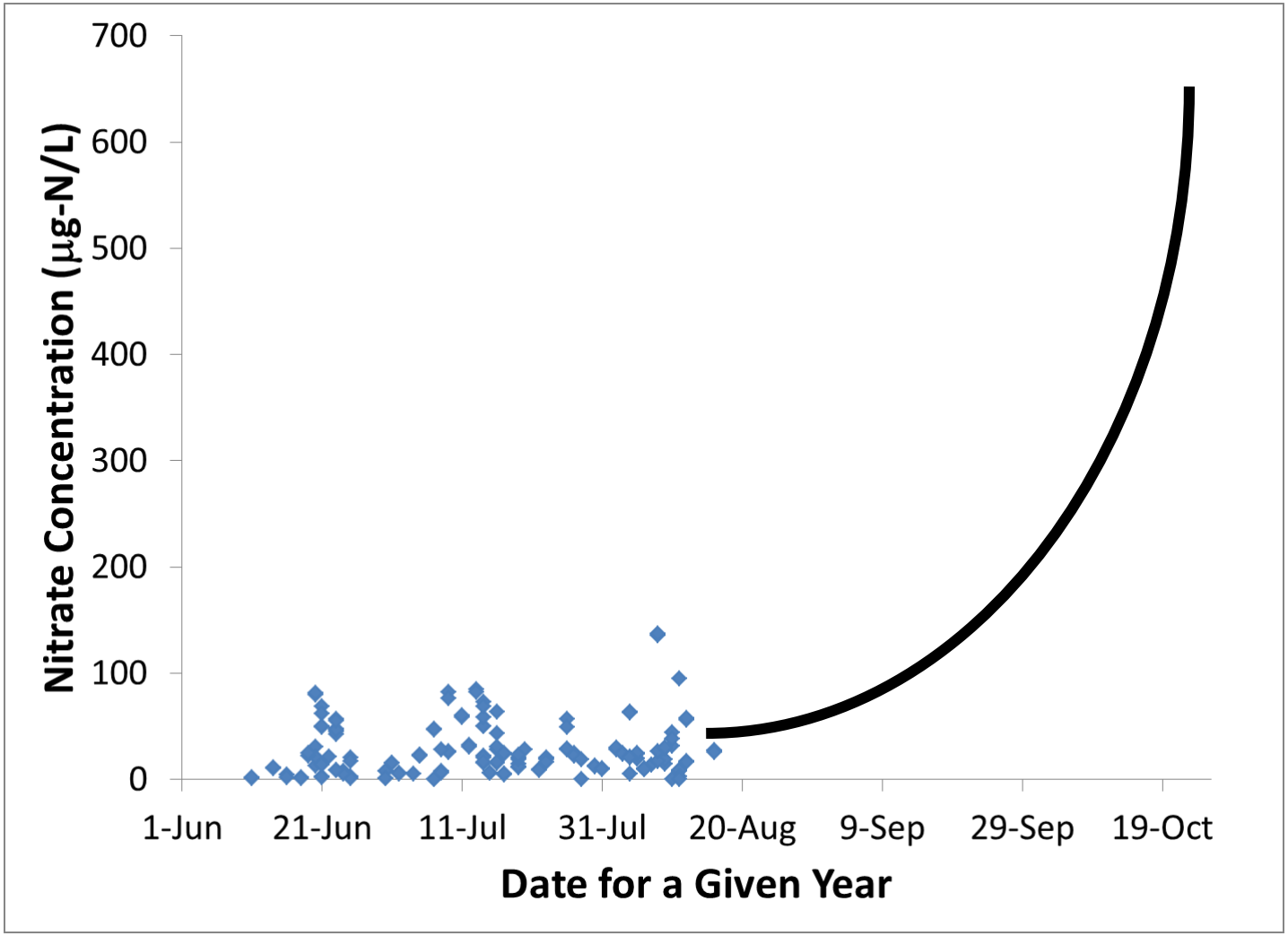


Based on "12-and-6" criteria

-12 inches ground frost
-6 inches of snow

History of the Alaska Department of Natural Resources, Tundra Travel Management, 1969 -2003, Alaska DNR, 2004

Changing seasonality → Increased nutrient concentrations in streams



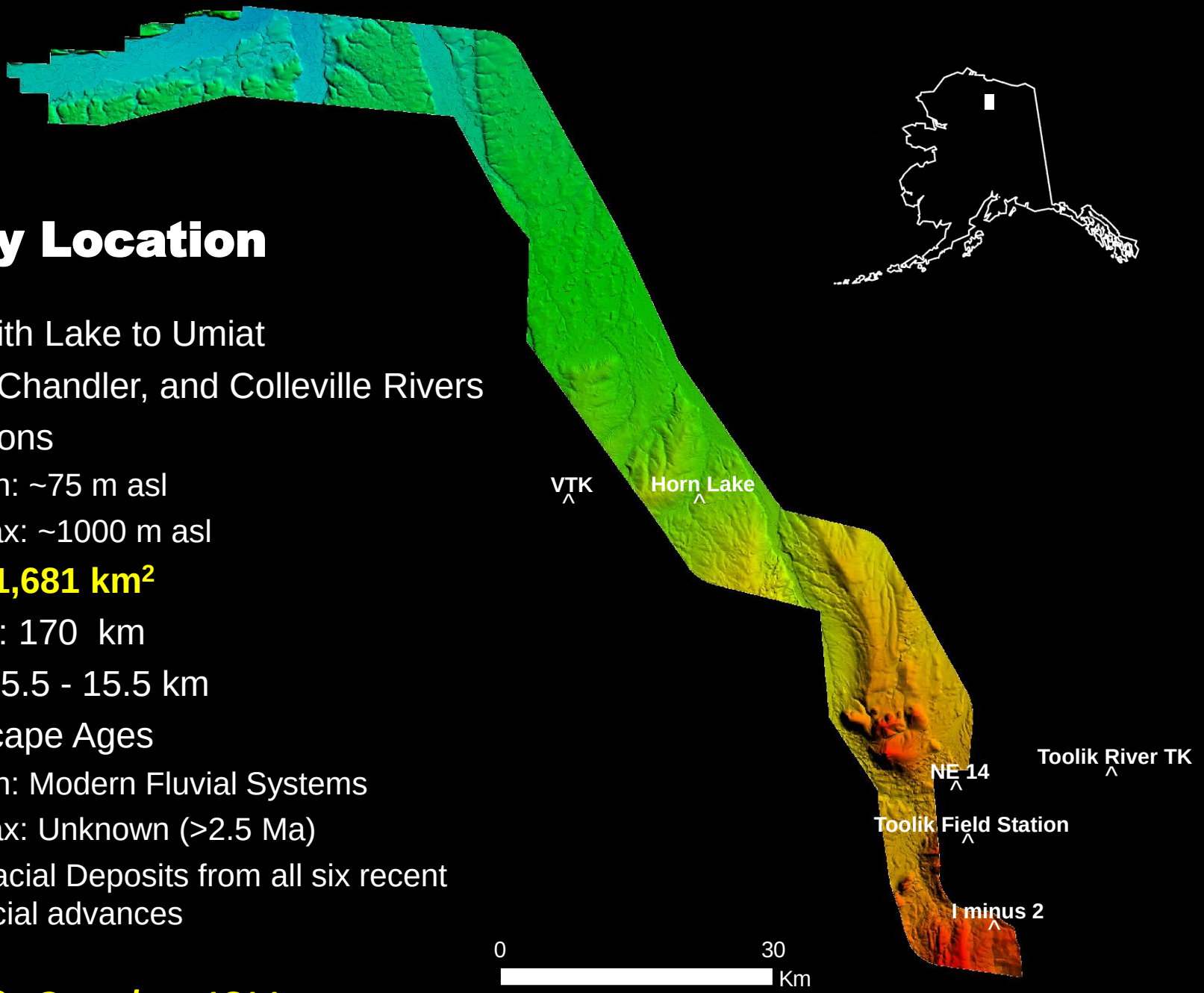
Kuparuk River, 1990-2008

Trend line after data from T Douglas

Changes to the Winter – *Warm Pulses*

Study Location

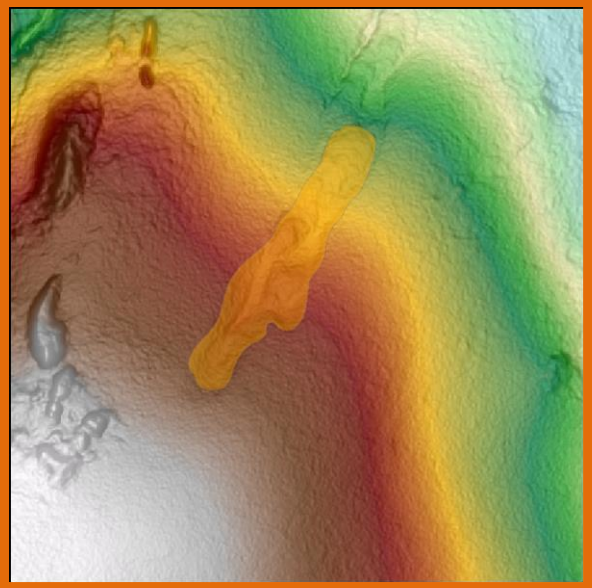
- Galbraith Lake to Umiat
- Itkillik, Chandler, and Colleville Rivers
- Elevations
  - Min: ~75 m asl
  - Max: ~1000 m asl
- **Area: 1,681 km^2**
- Length: 170 km
- Width: 5.5 - 15.5 km
- Landscape Ages
  - Min: Modern Fluvial Systems
  - Max: Unknown (>2.5 Ma)
  - Glacial Deposits from all six recent glacial advances



Krieger & Crosby, ISU

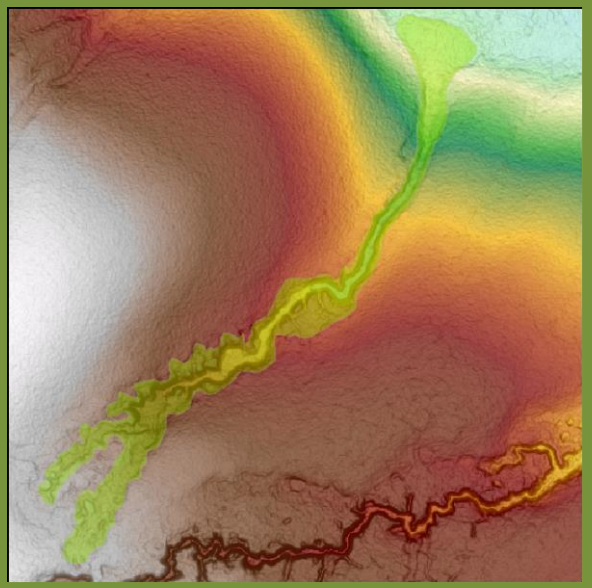
Thermal Erosion Feature Types

Active Layer Detachment



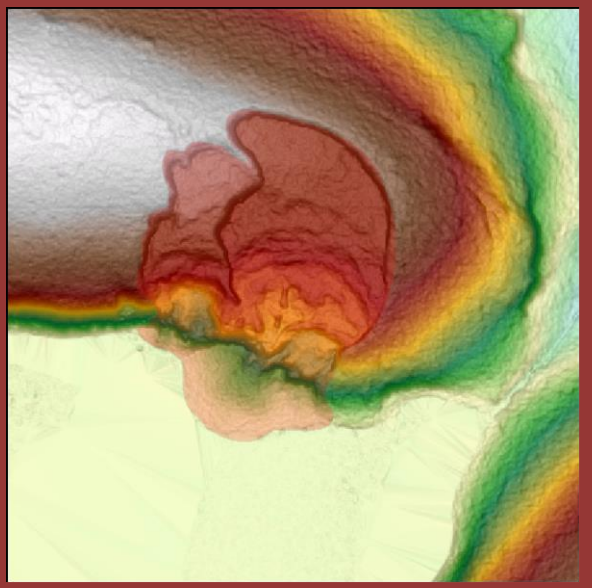
- Narrow
- Linear
- Depositional Lobe

Thermal erosion Gully



- Narrow
- Change Direction
- Spurs

Retrogressive Thaw Slump



- Wide
- Arcuate Headwall
- Hummocky Floor

Krieger & Crosby, ISU

~7800 features identified

~4 features /km^2

Krieger & Crosby, ISU

Field work is messy

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Need 3 types of work spaces:

1) mud room (dirty)

2) ‘office space’ (semi clean)

3) lab space (clean)

Data Telemetry is *Needed* beyond NEON

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- Data integrity
- Logistics efficiency

Science Focus on Shoulder Seasons

Personnel Shifts to Shoulder Seasons