Environmental Data Center

Brie Van Dam

TFS Steering Committee Meeting

Photo: Seth Beaudreault

Mission Statement

I. Collect and manage baseline environmental data
II. Maintain suite of common-use lab and field equipment
III. Fieldwork assistance
IV. Outreach
    a. Make EDC data available to the public
    b. Provide project metadata for current and historical projects at Toolik Lake

Photo: Seth Beaudreault

Met Station 2014 Highlights

- Above-ground sensors replaced with re-calibrated spares
- Temperature sensors converted to < -55°F model
- Spares for the data logger and net radiation sensor acquired (Kipp & Zonen model CNR-4)
- 2014 provisional data provided on request, final data to be posted in January
- Met station data report formalized and available on EDC website
- Collected airborne photos in 2013; collaborated with GIS on processing

Photo: Jessie Cherry

Met Station – in progress

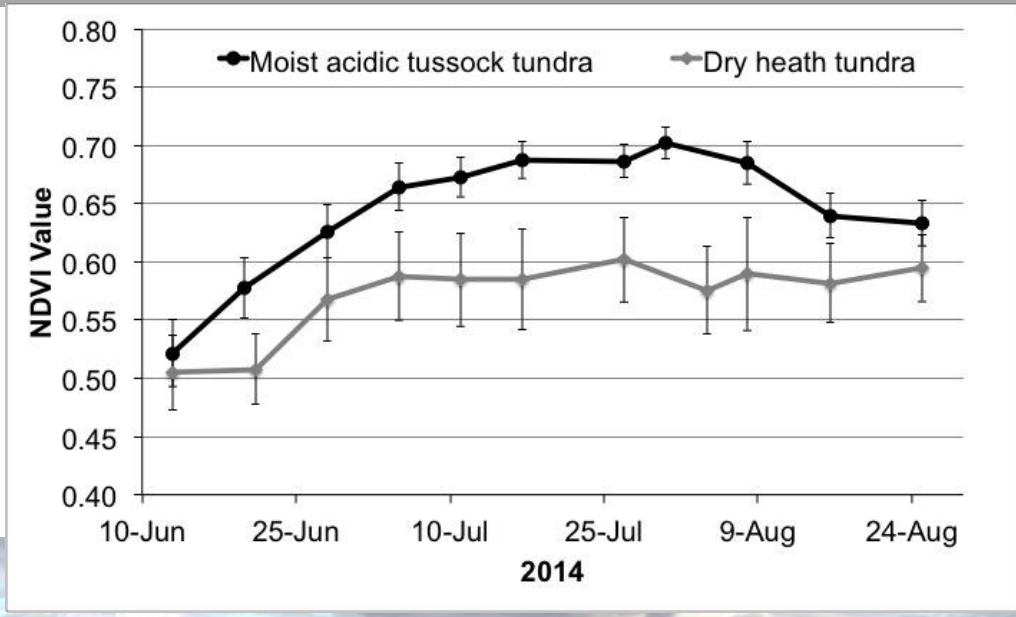
- Ethernet run in conduit to the site, and radio-based comm system installed for redundancy and reliability
- Value added products under development
- Use digital elevation model generated from collected imagery along with value added products to investigate microclimates in the vicinity of TFS

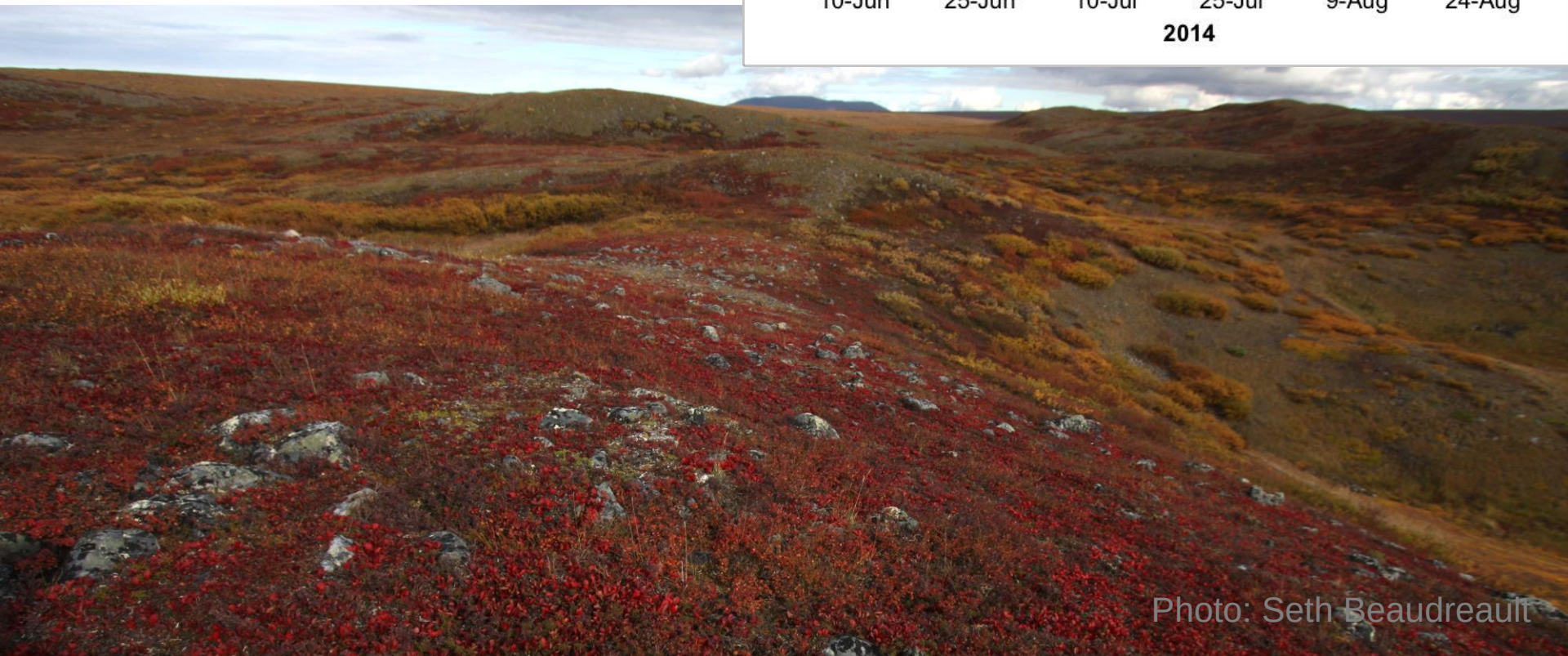
Photo: Jessie Cherry

I. Baseline Environmental Monitoring Program

Biological Monitoring Program

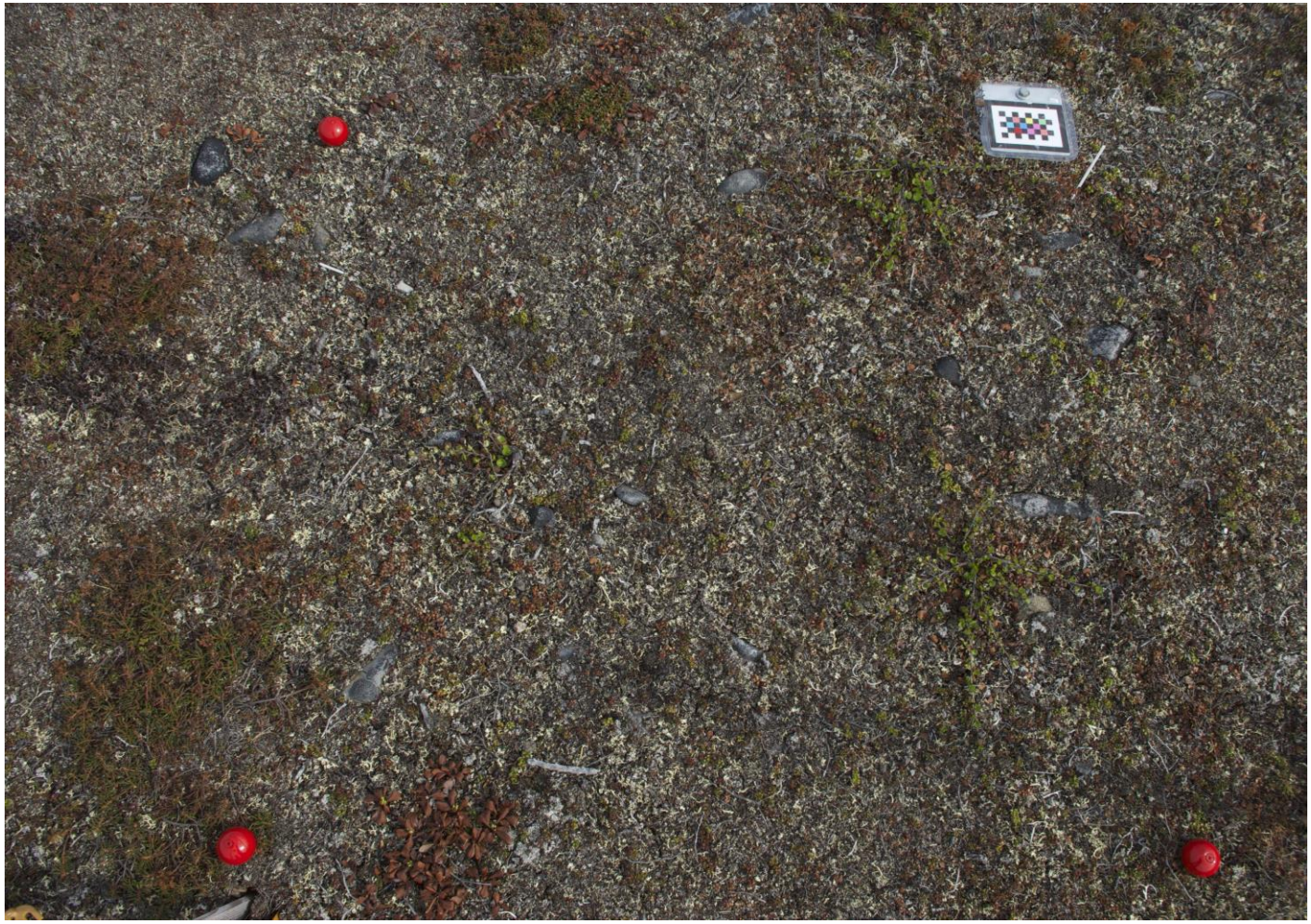
- Vegetation phenology
- NDVI
- Avian point counts
- Bird arrivals/departures





Biological Monitoring Program – New in 2014

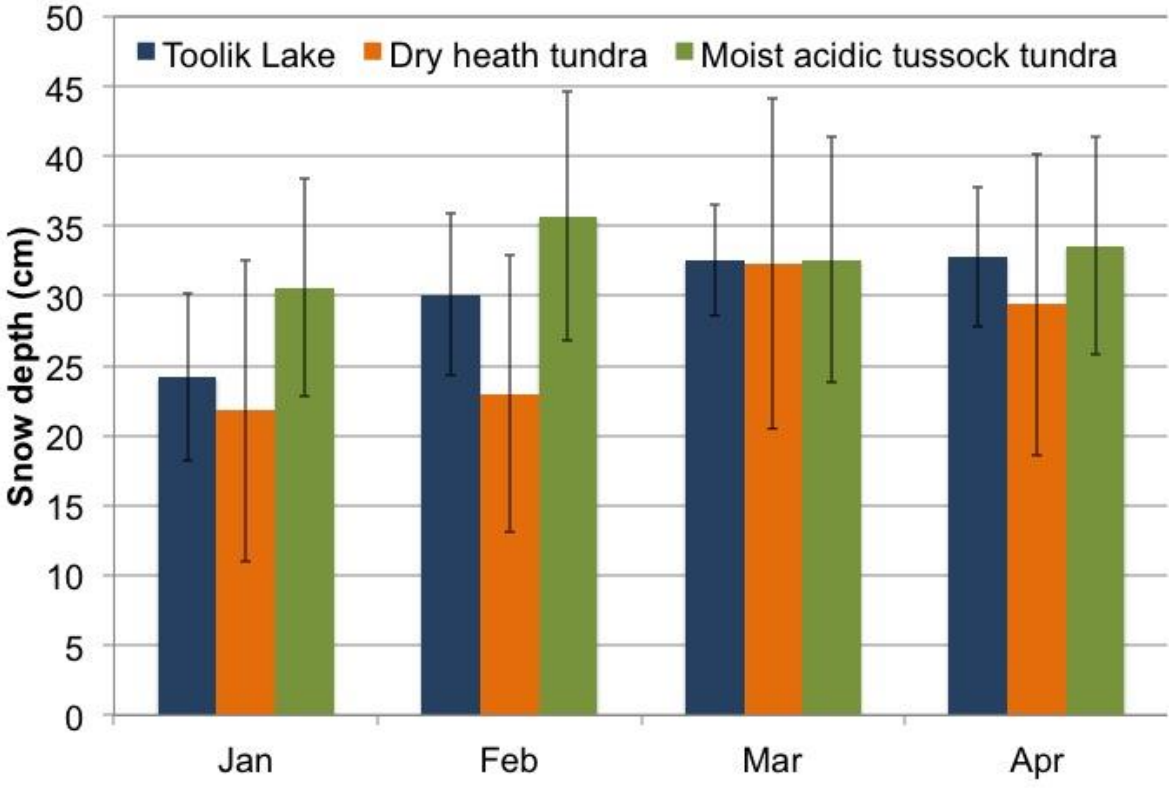
- ITEX Snapshot phenology
- Vegetation plot imagery and photo-analysis



I. Baseline Environmental Monitoring Program

Snow monitoring program

- Time lapse imagery
- Monthly measurements of depth and density
- Transect set up on Toolik Lake in 2014



I. Baseline Environmental Monitoring Program

Herbarium

- New specimens added to on-site Herbarium
- Live plant photos were taken in 2014, will be added to the Virtual Herbarium this winter/spring

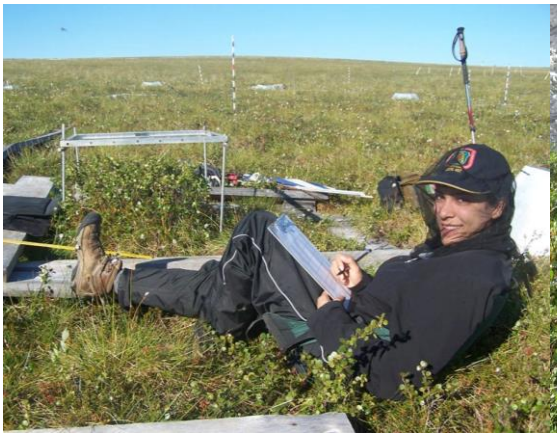
II. Common-use equipment

Equipment	2014		2013	2012	2011	2010	2009
Muffle furnace	33		43	34	31	25	11
Shaker table	58		10	27		3	16
Centrifuge					6	11	
Autoclave					11	23	13
Freeze drier			30	66	76	81	106
Leaf area meter (Licor)			7		18		51
Leaf area meter (WinFolia)	12		58	37	5		
Balances*	129		36	83	63	60	46
Scintillation counter	100		100	95	76		27
Hot stir plates*	16						
Compound microscope			9	75			
Unitron Stereoscope	27		61	51	94	14	79
Heerburgg Stereoscope	11		16	106	51	3	79
Hydrolab water profiler	88		70	70	76	77	26
Unispec spectral analyzer	18		13	37	76		
Flow Tracker	26		10	10			
Soil moisture probes*	6						
Soil temperature probes*							
Handheld weather meter*	7						
Dry Incubator			38	12	71	48	15
Incubation baths (6 total)	551		363	523	406	238	270
Total	**1082**		864	1226	1060	583	739

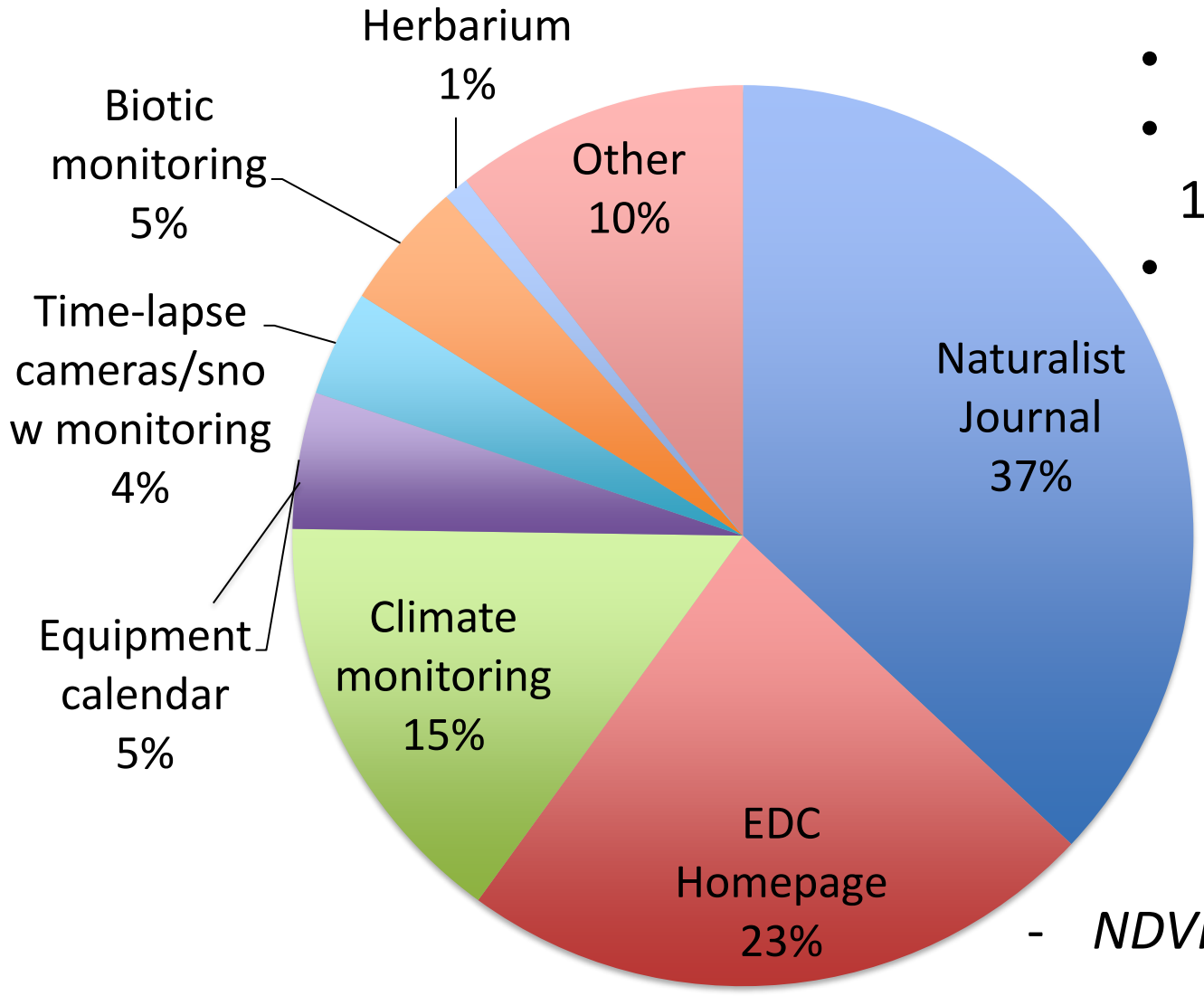
**indicates new equipment in 2014*

III. Field Work Assistance

- Apr 1 - Oct 1, 2014 season: ~**185 hrs, 29 researchers**
  Examples (not full list):
  - Sampling Fog Lakes bi-weekly, Toolik Lake weekly, with Dan White
  - Sweepnetting for bugs and collection of pitfall traps for Natalie Boelman in spring
  - Troubleshoot Atigun Gorge meteorological station for Team Squirrel in April
  - Collected and filtered weekly water samples from Oksrukuyik, Kuparuk, and Toolik Inlet Rivers in the late season for Breck Bowden
  - Dismantled Adrian Rocha's flux chambers in late September to allow late-season data collection




V. EDC Website and data use



- **44,832 pageviews**
- **3,806 individuals**
  10/1/2013 – 9/30/2014
- **14% increase over previous year**

New for 2014

- Track biotic data downloads

- Updated annual summaries

- NDVI and snow monitoring pages in the works

- Updated met instruments and common-use equipment

IV. Data Usage

Meteorological data

- **335 requests** from **70 different users** were made for meteorological parameters
- Example use in a publication:

Cory, R.M., Ward, C.P., Crump, B.C., Kling, G.W., 2014. Sunlight controls water column processing of carbon in Arctic fresh waters. Science (345) 6199, 925-928.

Biological data

- Biological data, including plant phenology and avian point counts, were downloaded **29 times** from the website this year
- Example use in a publication (in preparation):

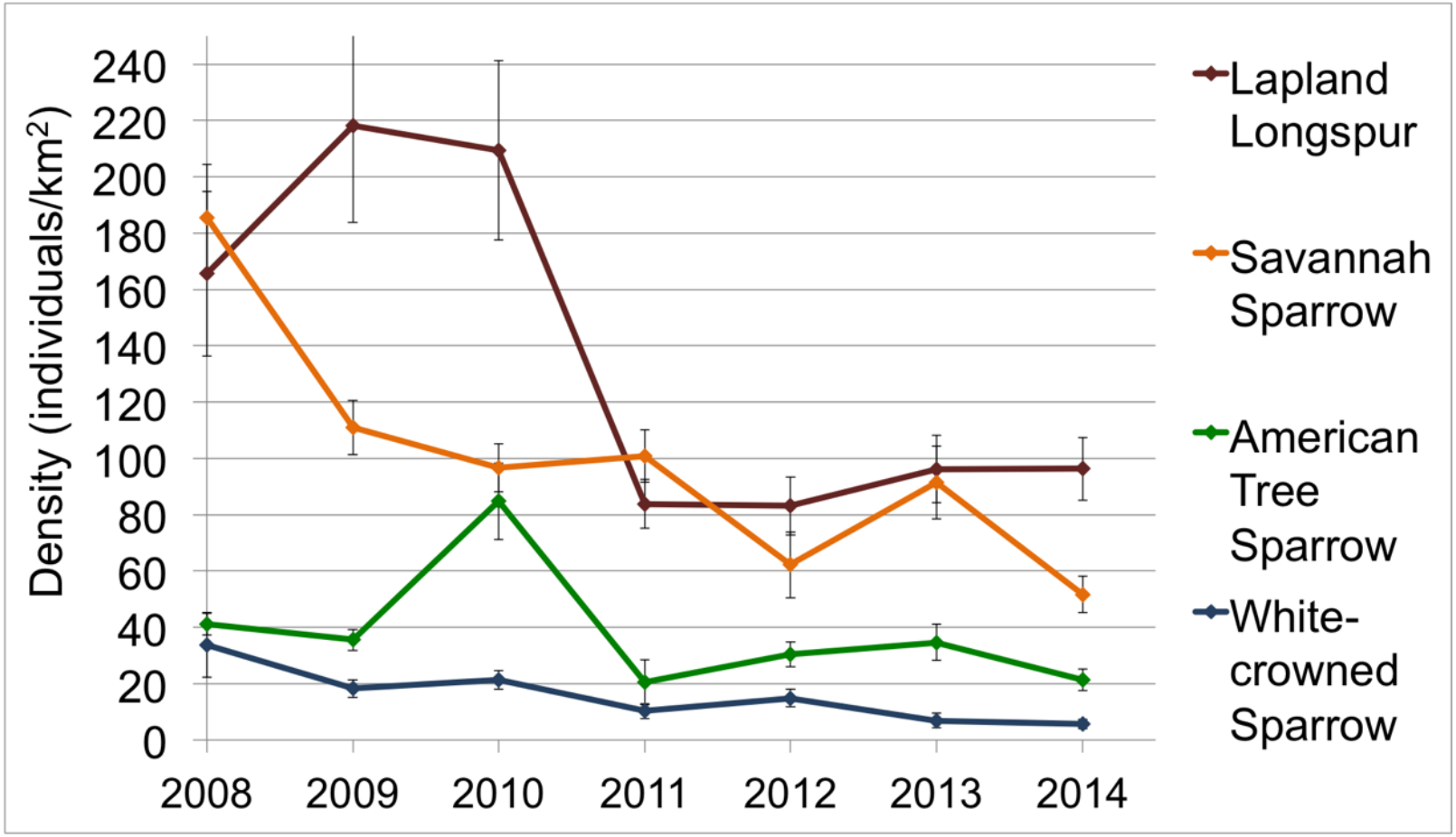
Kobayashi, H. et al.. Quantifying the understory vegetation phenology in Alaska from time-lapse cameras and satellite measurements. In preparation for Remote Sensing of the Environment.

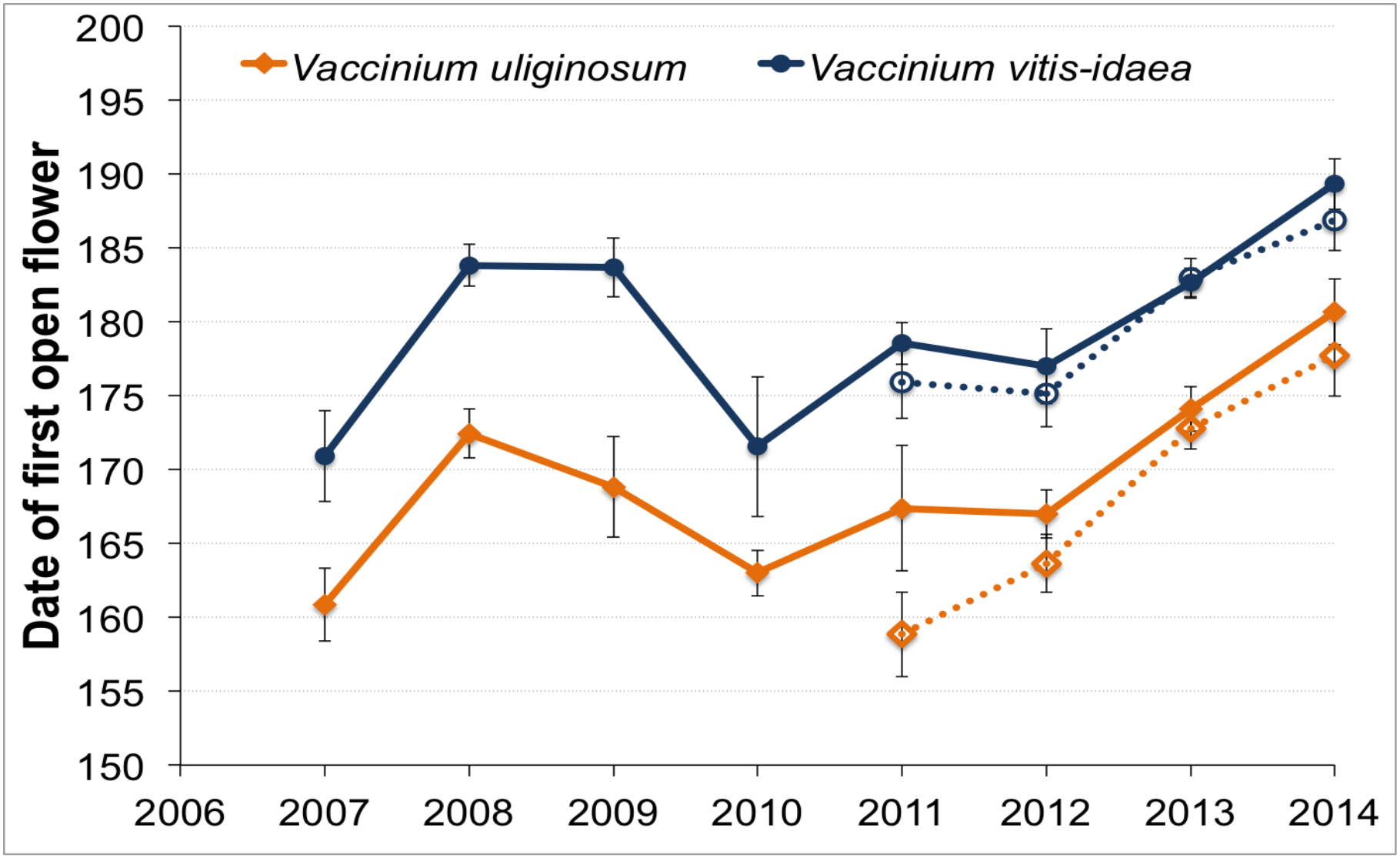
V. New and Continuing Projects

- Analysis of vegetation phenology plot photos
  - Comparison with manual observations
- INTERACT metadata survey complete
  - Assistance with integrating this past project metadata with new project metadata collection and database creation
- Aquatic macrophytes to Herbarium
- Arctic butterfly guide
- Open communication and collaboration with other observing networks on the north slope

Photo: Seth Beaudreault


Comments?


Density (individuals/km2)
240
220
200
180
160
140
120
100
80
60
40
20
0
2008
2009
2010
2011
2012
2013
2014
Lapland Longspur
Savannah Sparrow
American Tree Sparrow
White-crowned Sparrow


Vaccinium uliginosum
Vaccinium vitis-idaea
Date of first open flower
200
195
190
185
180
175
170
165
160
155
150
2006
2007
2008
2009
2010
2011
2012
2013
2014

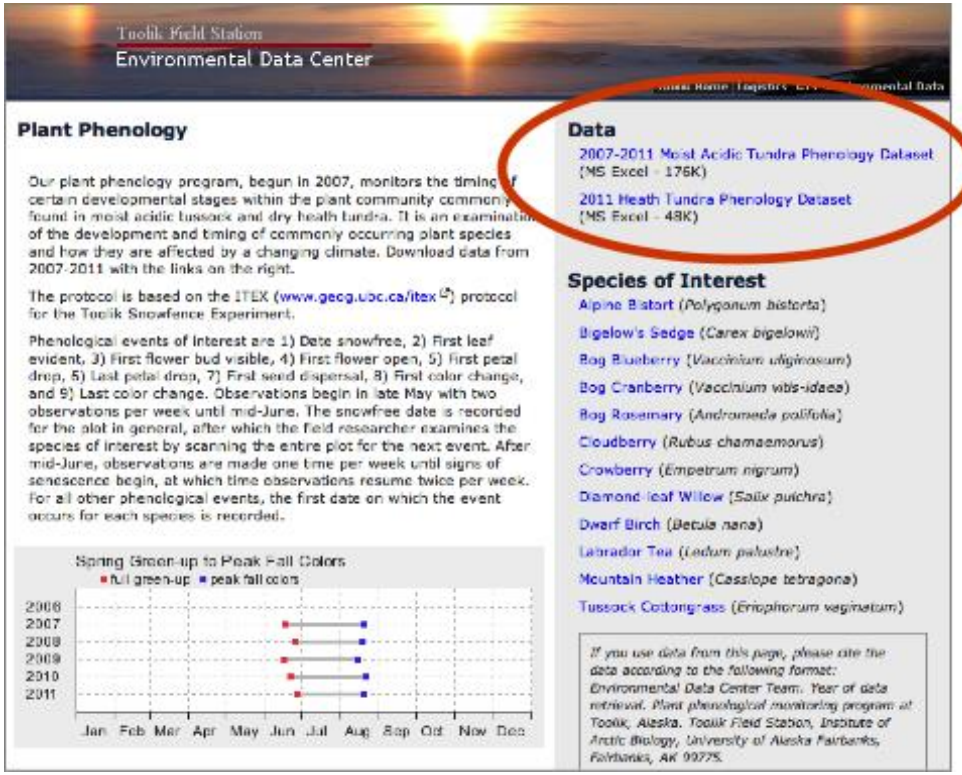
Data management

- We follow the best practices of data management as recommended by NSF.

  E.g. parameter definition, consistent data organization, basic quality assurance, documentation of metadata, data protection

- All data are freely available

on the EDC website, and the Global Change Master Directory.



II. Common-use equipment

Equipment	J	F	M	A	M	J	J	A	S	O	N	D	2014
Muffle furnace						10	13	10					33
Shaker table					4	17	22	15					58
Centrifuge													
Autoclave													
Freeze drier													
Leaf area meter (Licor)													
Leaf area meter (WinFolia)							12						12
Balances*					17	19	37	25	31				129
Scintillation counter					14	30	31	25					100
Hot stir plates*						2	2		12				16
Compound microscope													
Unitron Stereoscope							16	11					27
Heerburgg Stereoscope						4	7						11
Hydrolab water profiler				6	21	13	10		28		10		88
Unispec spectral analyzer						4	10	4					18
Flow Tracker					14	6	6						26
Soil moisture probes*							3	3					6
Soil temperature probes*													
Handheld weather meter*					3	1			3				7
Dry Incubator													
Incubation baths (6 total)					59	81	138	147	116	10			551
Total				6	132	187	307	240	190	10	10		**1082**