

Environmental Data Center

Brie Van Dam

TFS Steering Committee Meeting

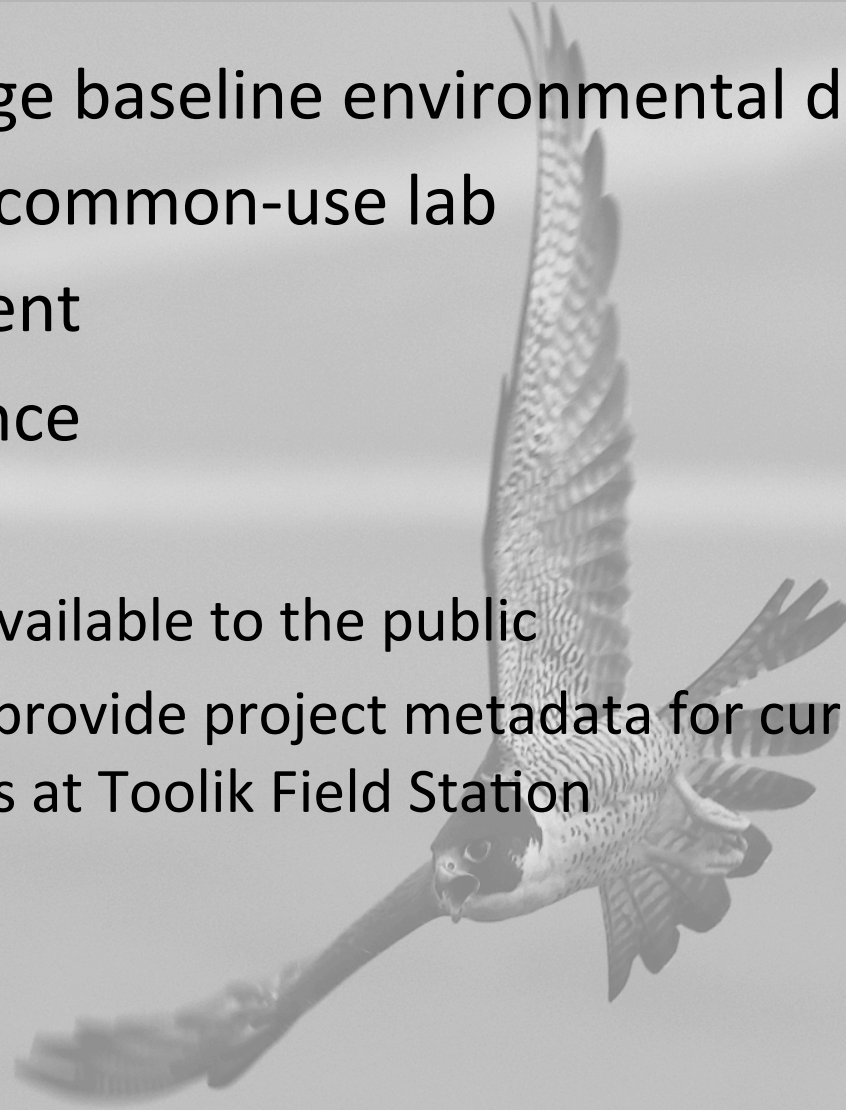
23 January 2016



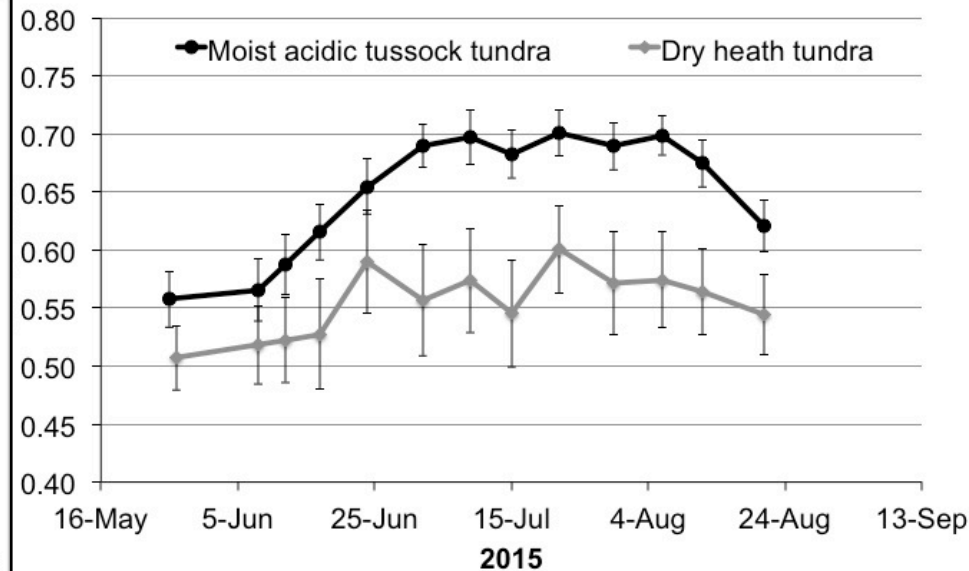
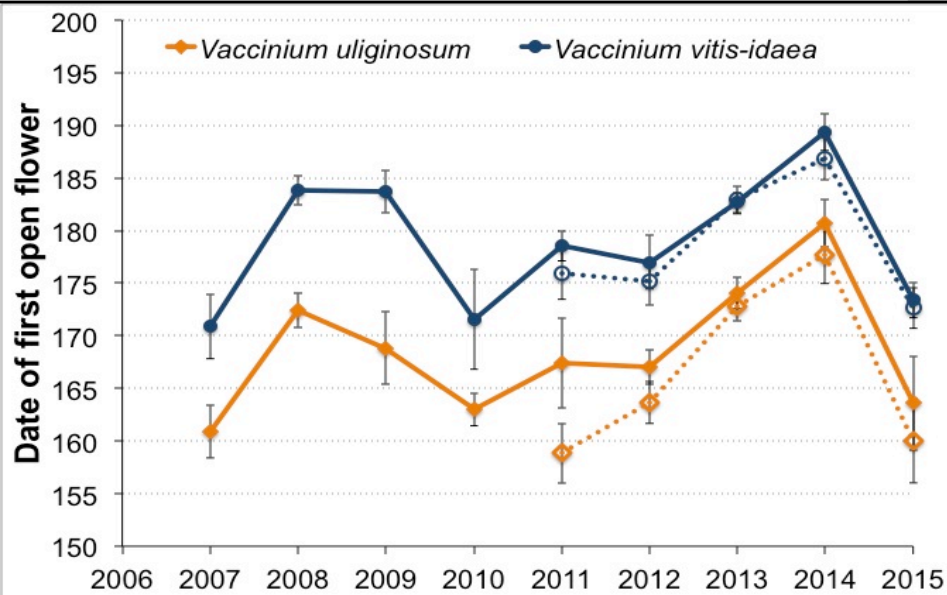
Photo: Seth Beaudreault

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. Collaboration to provide project metadata for current and historical projects at Toolik Field Station



I. Baseline Environmental Monitoring Program



Biological Monitoring Program

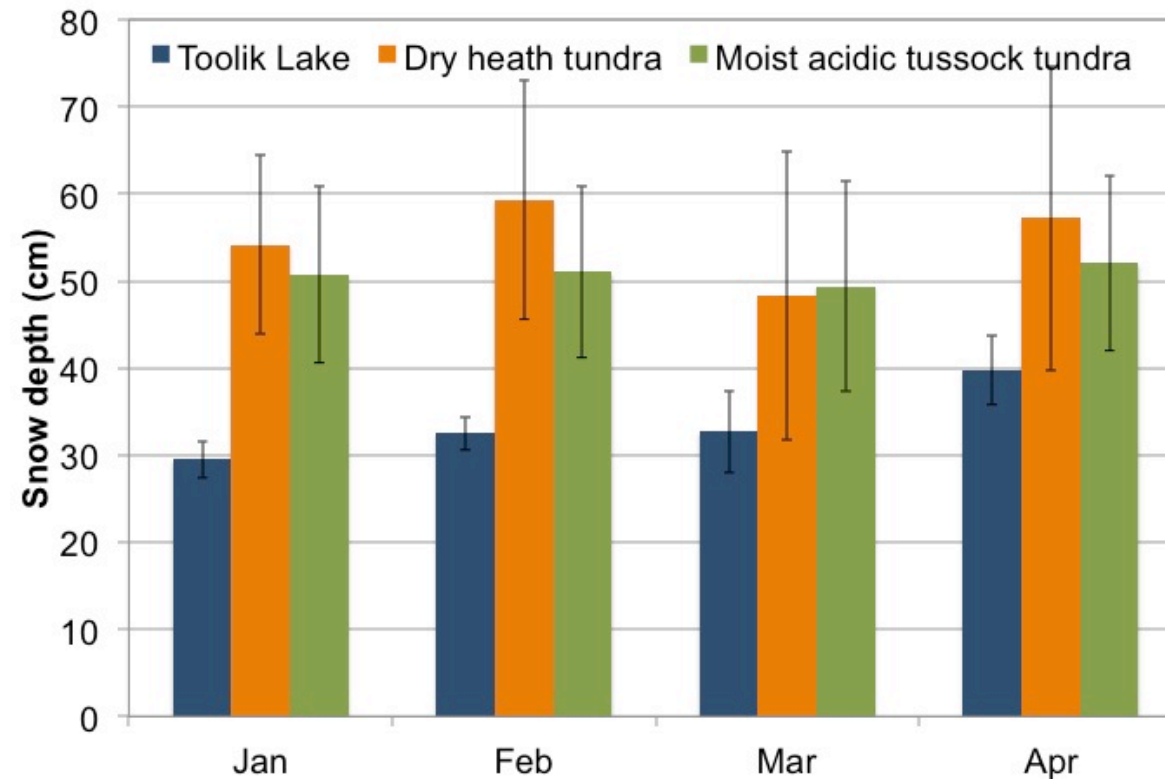
- Vegetation phenology
- NDVI
- Avian point counts
- Bird arrivals/departures
- Naturalist journal

Photo: Seth Beaudreault

I. Baseline Environmental Monitoring Program

Snow monitoring program

- Time lapse imagery
- Monthly measurements of depth and density (SWE)
- Sonic ranger snow depth at met station



I. Baseline Environmental Monitoring Program

2015 updates

- Vegetation plot imagery and photo-analysis
- Vascular plant identification guide for TFS
- Timing of snow melt at Imnavait



I. Baseline Environmental Monitoring Program

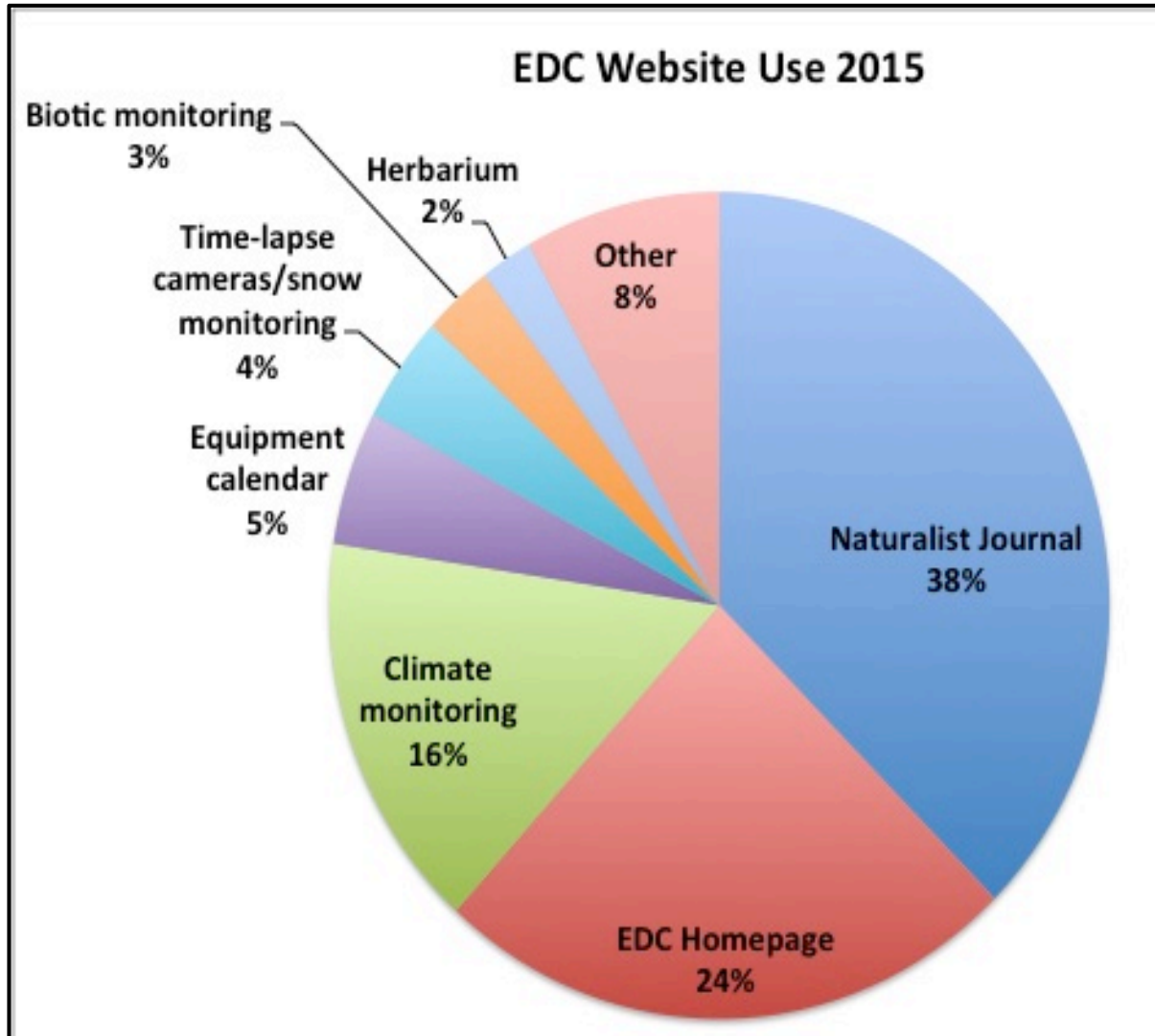
Herbarium

- New specimens added to on-site Herbarium
- Over 100 live photos added to online virtual herbarium, continuing project



Photos: Adeline Murthy

I. EDC Website



- **38,623 pageviews**
10/1/2014 – 9/30/2015
4,056 unique visits

New for 2015:

- Updated annual summaries
- Updated common use equipment
- Bird guide improvements
- Virtual Herbarium

Meteorological data

- **239 requests** from **87 different users** were made for meteorological parameters

Biological data

- Biological data, including plant phenology and avian point counts, were downloaded **32 times** from the website this year



I. Data Usage

Examples of data use (not full list)

- Real-time **met data** to drive experimental decisions
- **Vegetation phenology** and **record of lake freeze/thaw** used by Mark Urban and Cam MacKenzie for rapid communication about springtime fish dynamics
- **Snow depth and SWE** used by Colin Tucker to model the effects of a variable snowpack at TFS on ecosystem fluxes of carbon and nitrogen

Publications

- 3 manuscripts currently submitted and in review process; one published in 2015
- Include use of meteorological data, snow cover data, time lapse images, bird arrivals/departures

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

Krause et al. (2015). Oecologia, pp 1-12, DOI 10.1008/s00442-015-3447-7.

Van Dam et al., Summertime surface ozone behavior and deposition to tundra in the Alaskan Arctic. In review, JGR Atmospheres.

Updates

- Data archival with IARC
- DOI's for all data sets with DataCite



Photo: Brie Van Dam

II. Common-use equipment

Equipment	2015	2014	2013	2012	2011	2010	2009
Muffle furnace	16	33	43	34	31	25	11
Shaker table		58	10	27		3	16
Centrifuge					6	11	
Autoclave					11	23	13
Freeze drier	4		30	66	76	81	106
Leaf area meter (Licor)	1		7		18		51
Leaf area meter (WinFolia)	29	12	58	37	5		
Balances	84	129	36	83	63	60	46
Hot stir plates	42	16					
Compound microscope	6		9	75			
Unitron Stereoscope	15	27	61	51	94	14	79
Heerburgg Stereoscope		11	16	106	51	3	79
Leica LED Stereoscope	30						
Zeiss Primostar microscope	5						
Hydrolab water profiler	52	88	70	70	76	77	26
Unispec spectral analyzer	23	18	13	37	76		
Flow Tracker	46	26	10	10			
Soil moisture probes	67	6					
Soil temperature probes	11						
Handheld weather meter	7	7					
Dry Incubator			38	12	71	48	15
Incubation baths (6 total)	572	551	363	523	406	238	270
Total	1010	982	864	1131	984	583	712

III. Field Work Assistance

- 2015 season: ~**259 hrs**, **22 researchers**

Examples (not full list):

- Sampling Fog Lakes bi-weekly, Toolik Lake weekly, with Dan White
- Filtered samples collected from the Fog Lakes and Toolik Lake for DNA analysis for Byron Crump between August and September
- Collection of precipitation samples for Martin Jiskra for mercury isotope analysis
- Collected and filtered weekly water samples from Oksrukuyik, Kuparuk, and Toolik Inlet Rivers in the late season with Sam Parker
- Measured snow depth at 12 control and snow fence plots at Ice Cut for Ellen Dorrepaal in February, March, and May



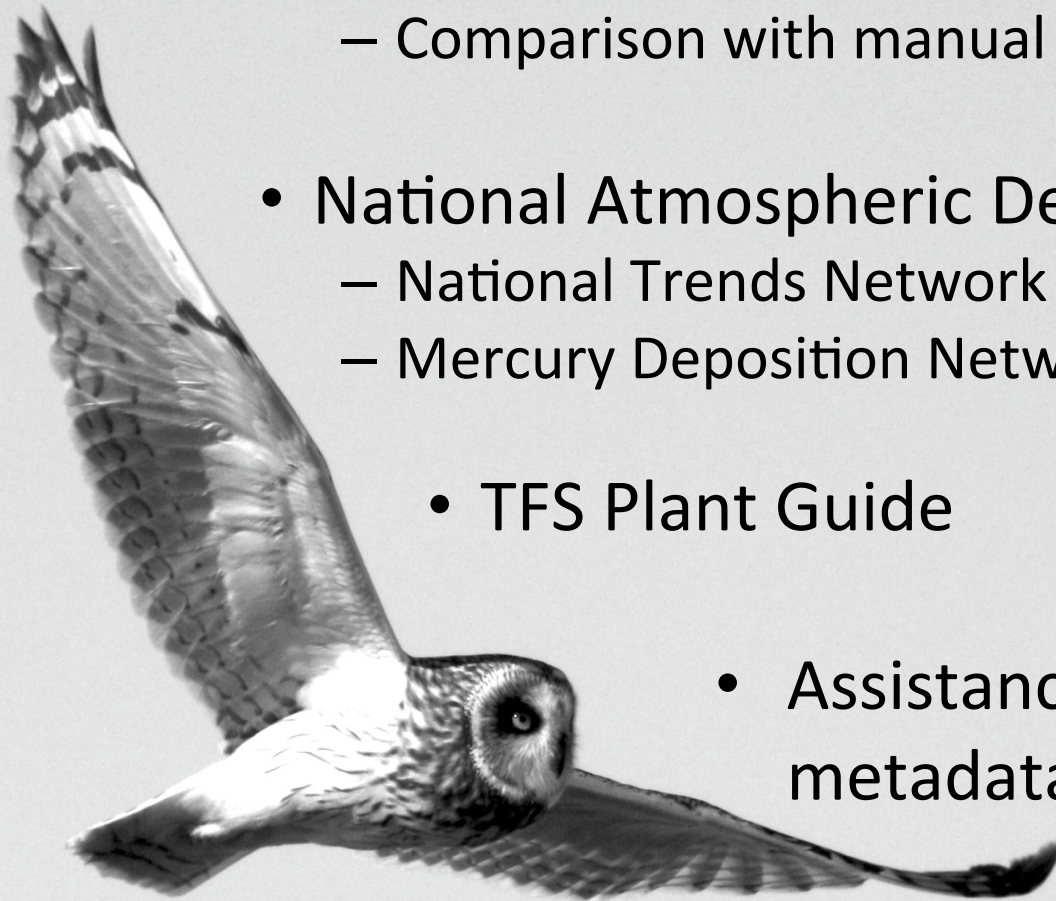
IV. Outreach

- Collaboration with other TFS departments (including GIS) to provide project metadata
 - INTERACT Research and Monitoring report published
 - Searchable INTERACT monitoring metadatabase live, available on web
- Work with high school teachers to provide EDC data to classrooms
- Talking Shop seminars
- Naturalist hikes



V. New and Continuing Projects

- Vegetation phenology plot photos
 - Comparison with manual observations
- National Atmospheric Deposition Network
 - National Trends Network (precip chemistry)
 - Mercury Deposition Network (Total Hg)
- TFS Plant Guide
- Assistance with project metadata collection
- Open communication and collaboration with other observing networks on the north slope



Questions?



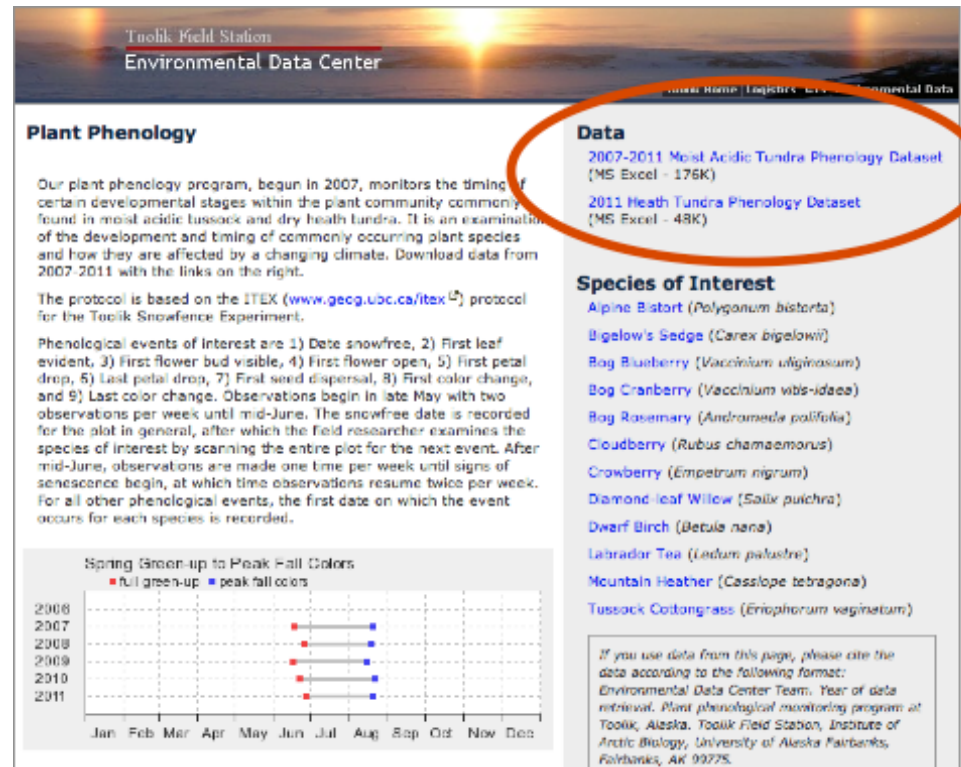
Photo: Seth Beaudreault

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

Notes

Notes