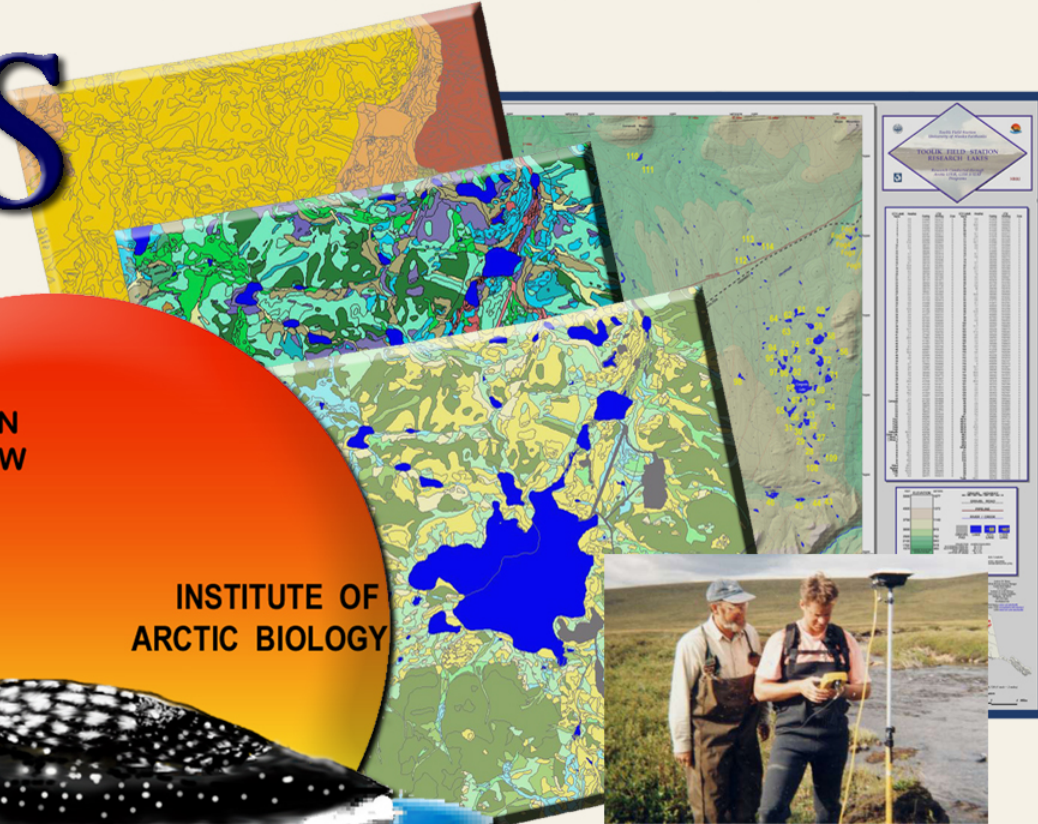
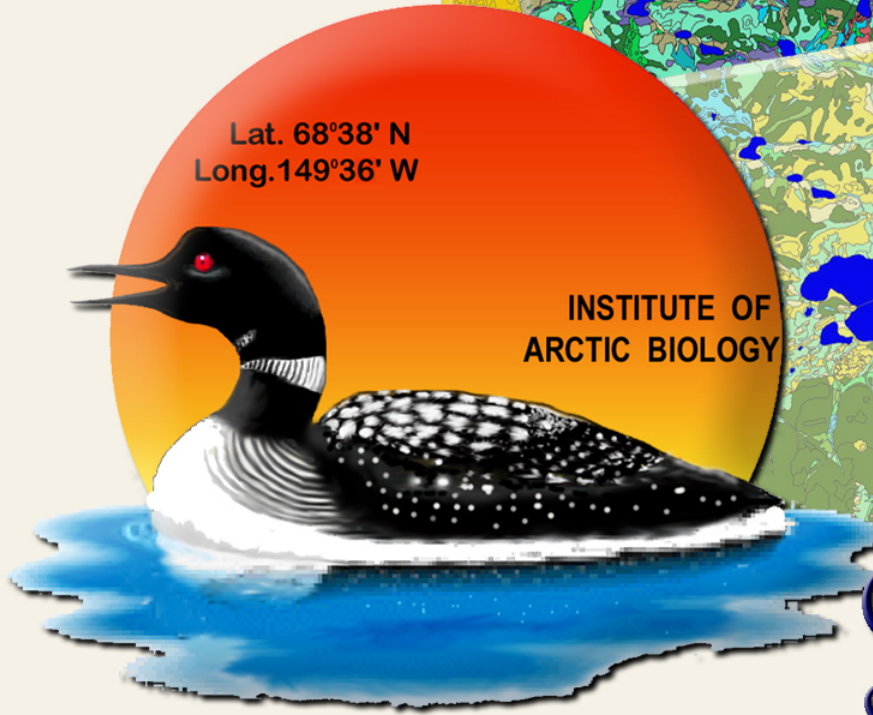


TOOLIK FIELD STATION

GIS

Lat. 68°38' N
Long. 149°36' W

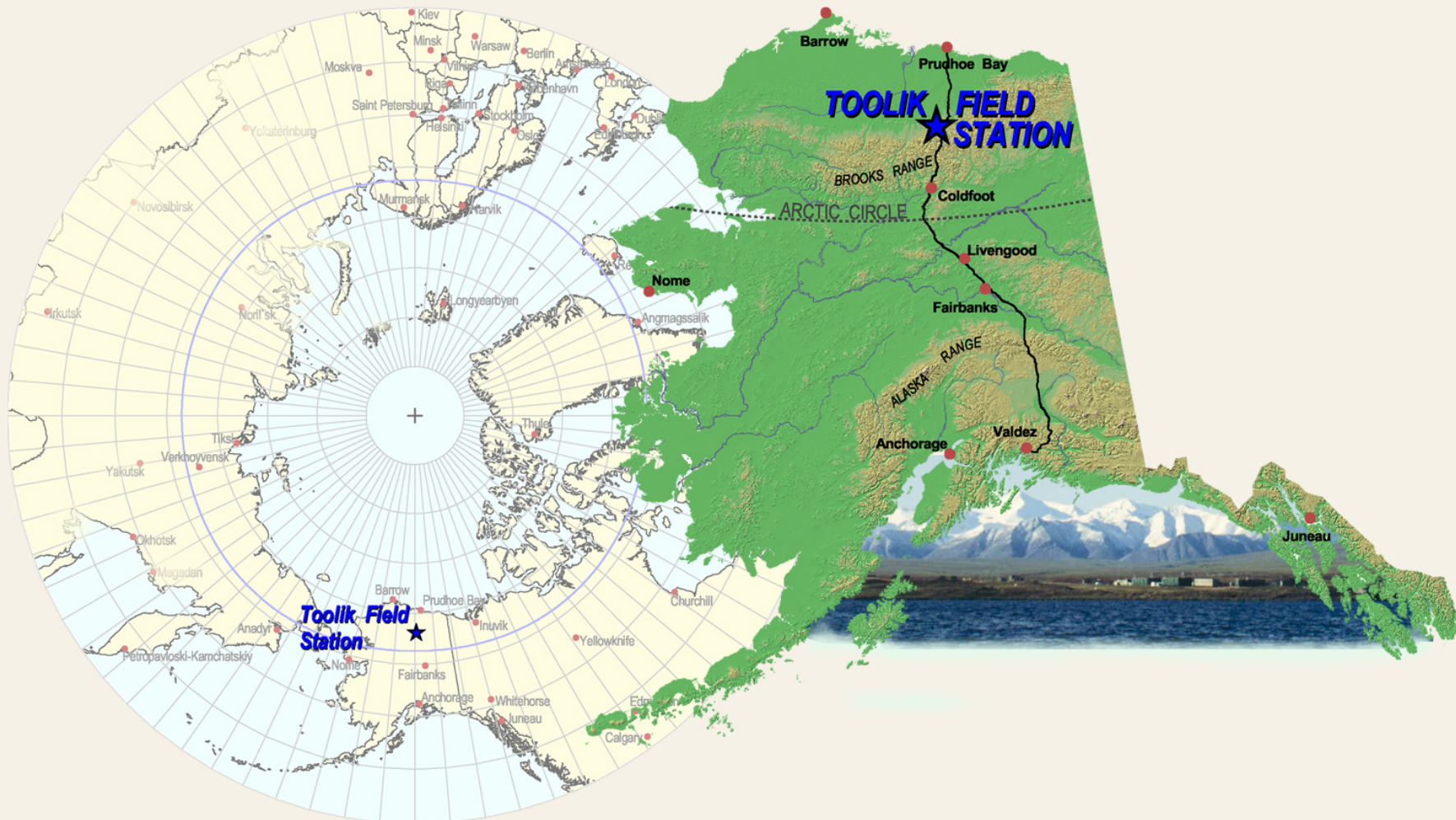
INSTITUTE OF
ARCTIC BIOLOGY



CURRENT SUPPORT & FUTURE SERVICES

Toolik Field Station Mission:

Support Research Science Through Facilities,
Logistics & Management



Annual Clientele: 300 researchers / 60 institutions (roughly)

150°00' 00"W

145°00' 00"W

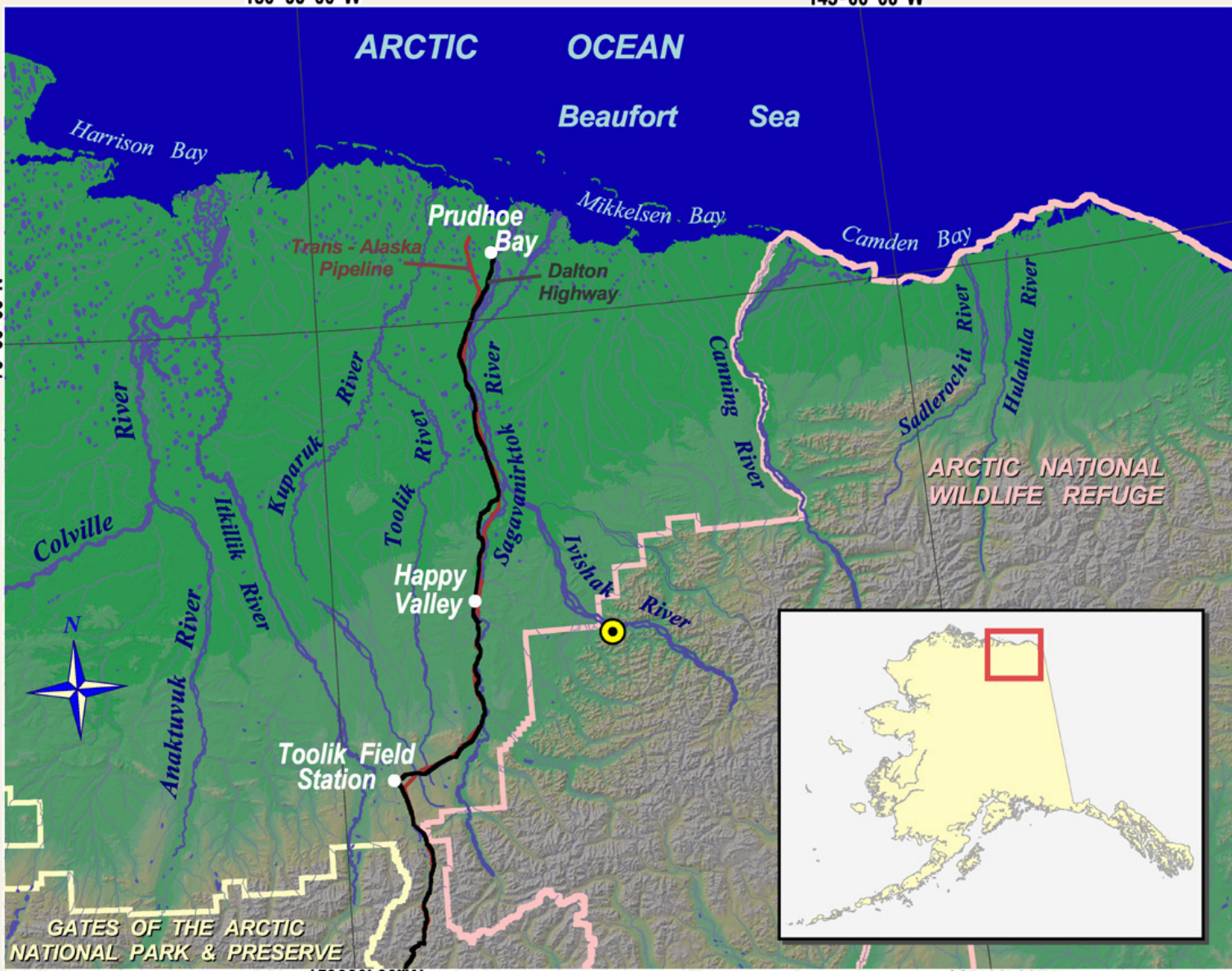
ARCTIC OCEAN

Beaufort Sea



70°00' 00"N

70° 00' 00" N

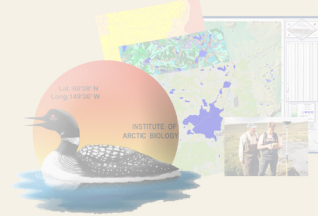
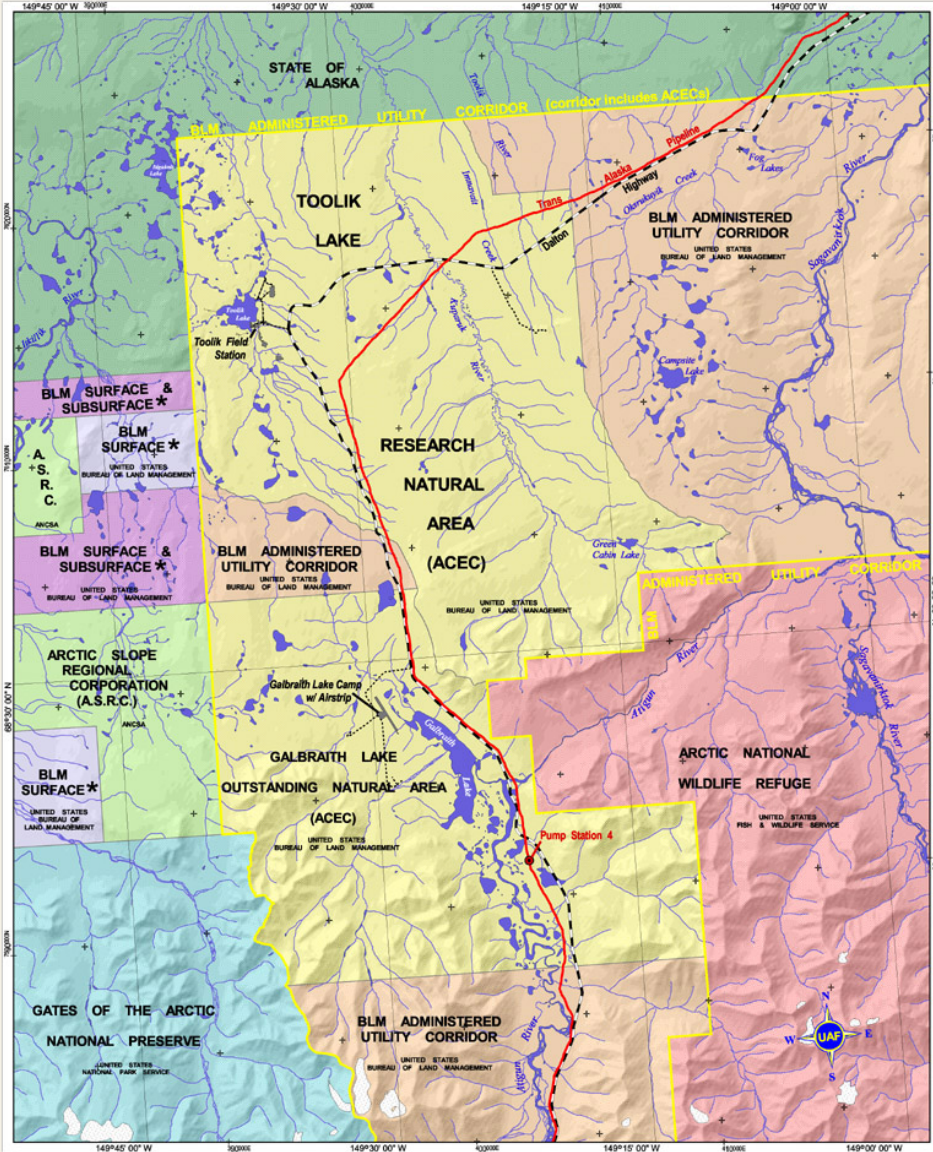


Andrew W. Balser
 Toolik Field Station
 Institute of Arctic Biology
 University of Alaska Fairbanks
fnawb@uaf.edu

150°00' 00"W

145°00' 00"W





Toolik Fun Facts:

Toolik RNA - BLM - 78,000 acres

Toolik Field Station – IAB/UAf – 27 acres (lease)

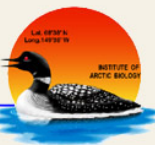
Toolik LTER (Arctic LTER) - MBL

SCALE: 1 : 126,720
 PROJECTION: ALBERS EQUALAREA
 1ST STANDARD PARALLEL: 55 0' 0" N
 2ND STANDARD PARALLEL: 65 0' 0" N
 CENTRAL MERIDIAN: 154 0' 0" W
 LATITUDE OF ORIGIN: 50 0' 0" N
 DATUM: NAD27
 GRID LINES: GEOGRAPHIC (lat. / long)
 QUADRANT: NORTHWEST
 GRID TICS: UNIVERSAL TRANSVERSE MERCATOR (UTM)
 UNITS: METERS
 ZONE: 6 NORTH

Toolik Lake R. N. A. & General Land Status

Toolik Field Station

Institute of Arctic Biology
 University of Alaska Fairbanks

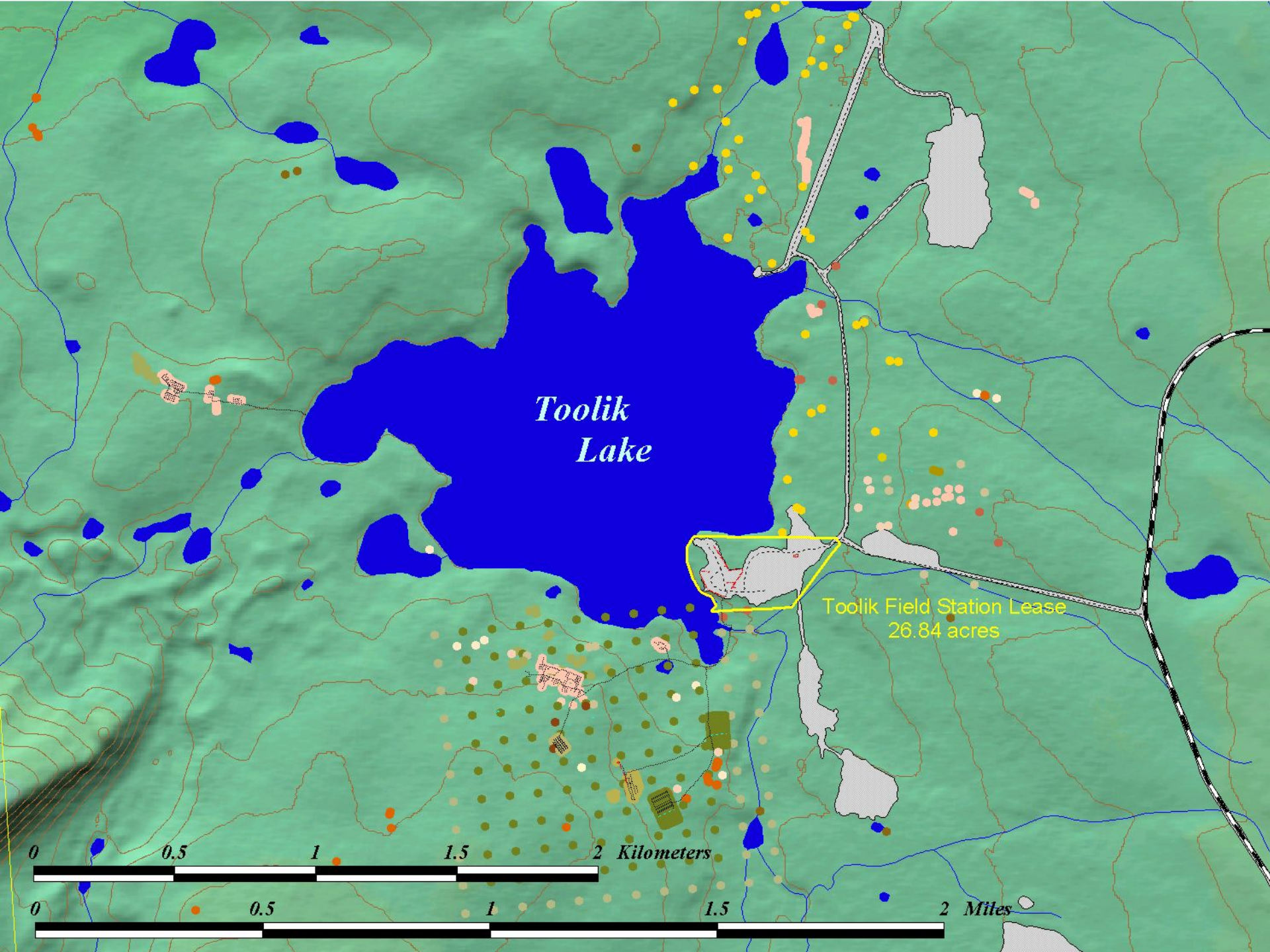


BLM Surface and *BLM Surface & Subsurface* units may be encumbered by state or private subdivisions. Contact BLM (Northern Field Office, Dalton Unit) for more information.
 ACEC is Area of Critical Environmental Concern, and contains the designations "RNA" and "ONA".
 This map is accurate to the best knowledge of the author as of November 19, 2001.
 This map is NOT considered the "official" land status map for legal purposes.
 Note that land status is subject to change, and that verification of the most current status through BLM (Northern Field Office, Dalton Unit) is necessary.

Andrew W. Stohler
 GIS & Remote Sensing Manager
 Toolik Field Station
 Institute of Arctic Biology
 313 Irving
 P.O. Box 797000
 University of Alaska Fairbanks
 Fairbanks, AK 99775
 (907) 474-2486 phone
 (907) 474-2222 fax
 andrew@iab.uaf.edu
 www.uaf.edu/iab

November 19, 2001





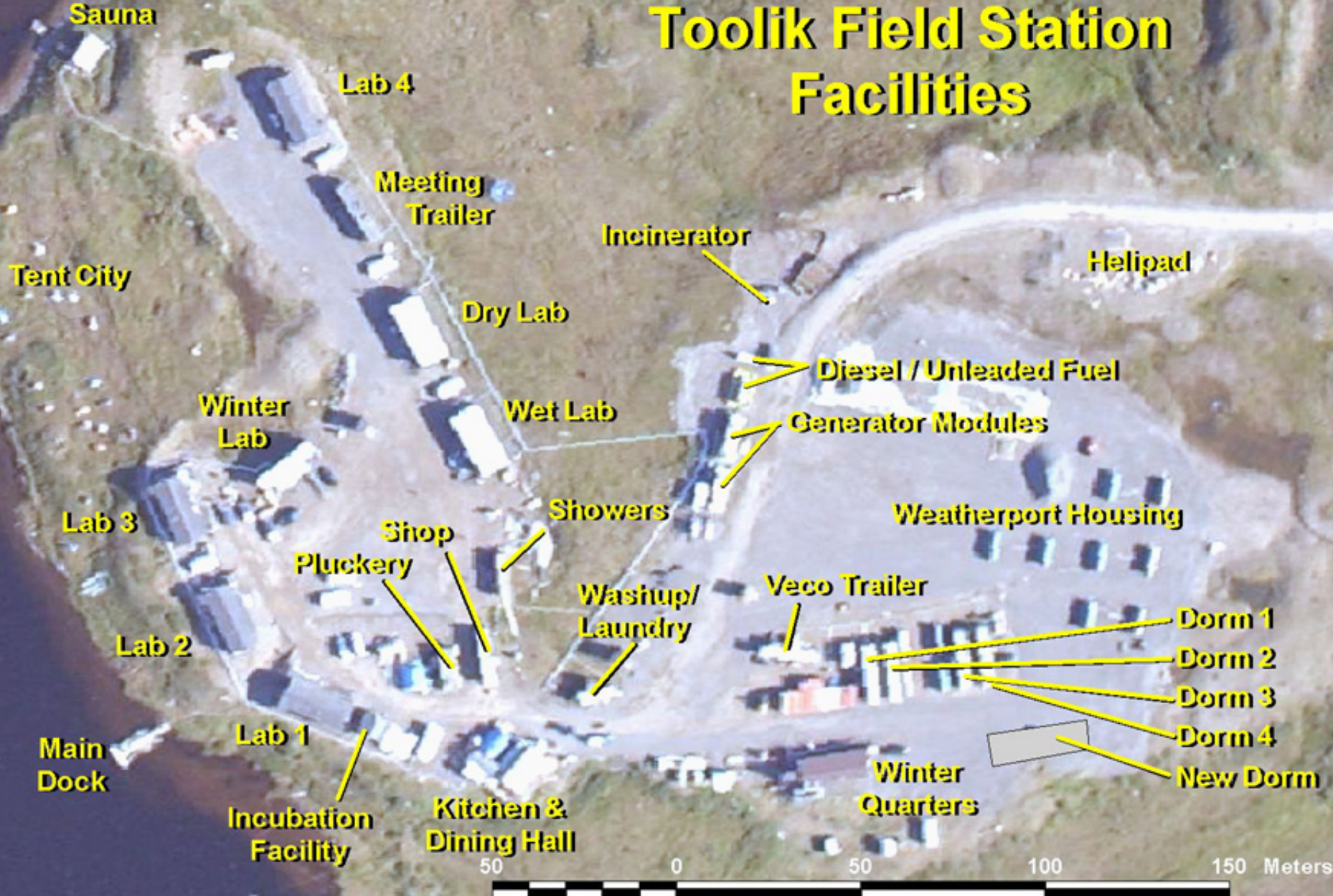
*Toolik
Lake*

Toolik Field Station Lease
26.84 acres

0 0.5 1 1.5 2 Kilometers

0 0.5 1 1.5 2 Miles

Toolik Field Station Facilities





Toolik Field Station GIS:

Support Research Science

Data Development/Management/Dissemination

Analyses & Consultation

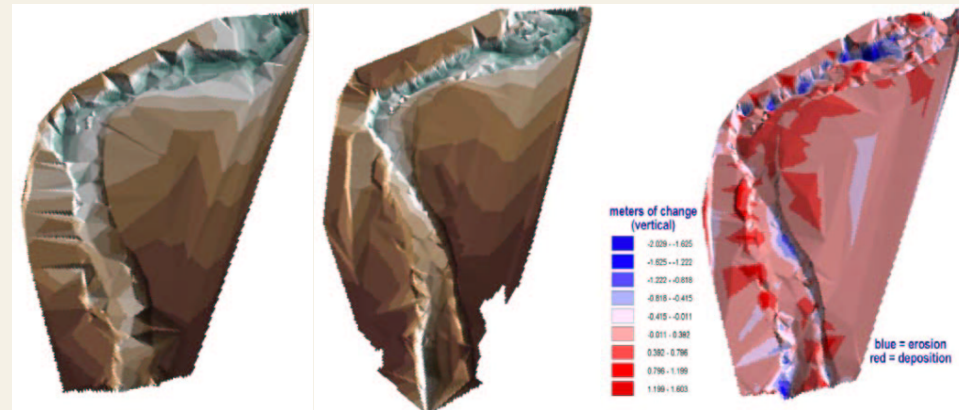
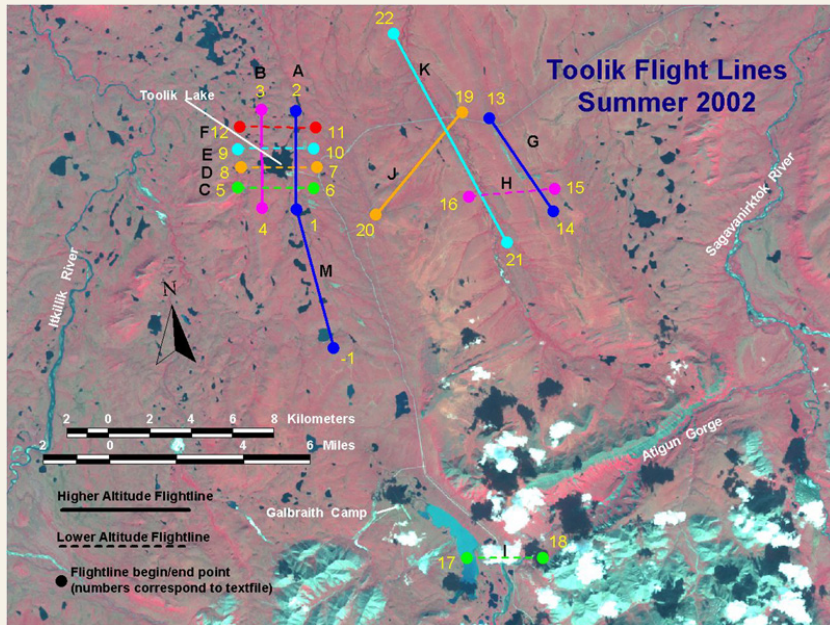
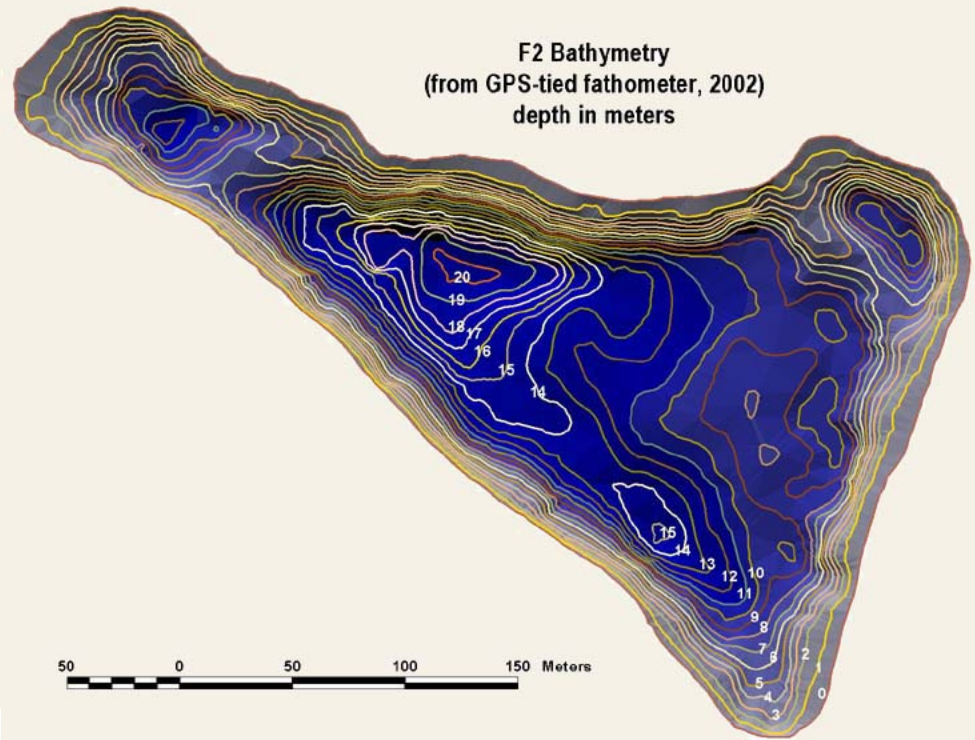
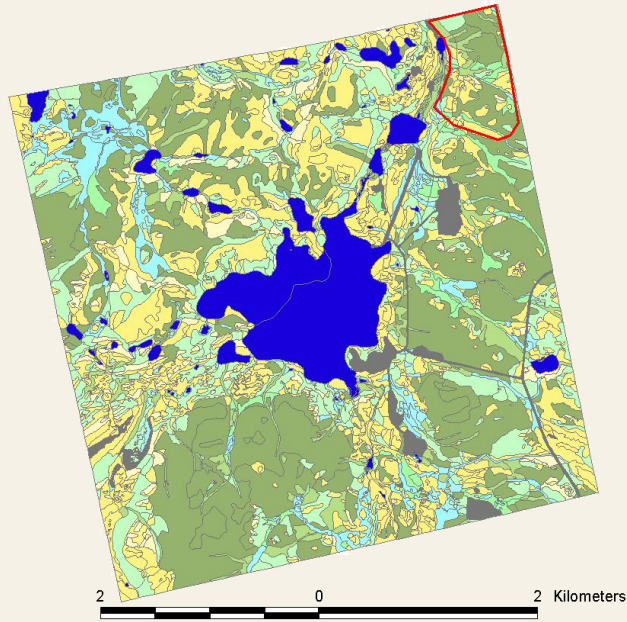
Logistical Support

Support Science, Landscape & Facility Management

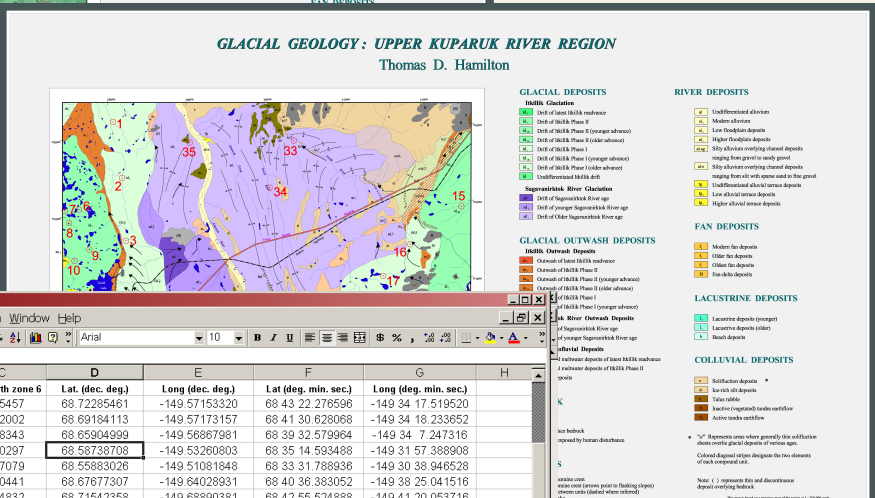
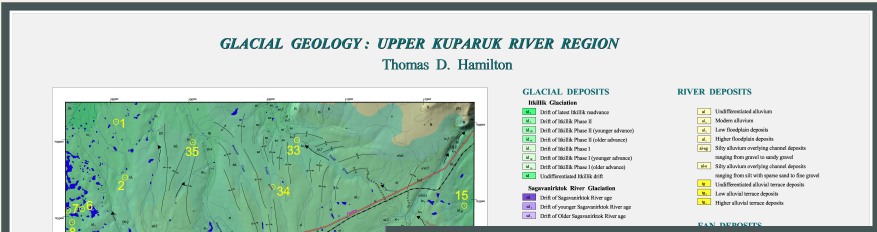
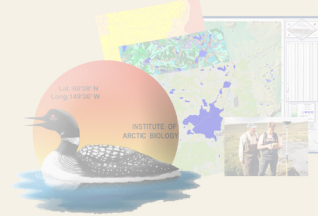
Outreach to Agencies

Toolik Natural Resource Tool

Data



Research Support - Breck Bowden, Stream Landscape Survey



Microsoft Excel - SLS Coord Update.xls

DRAFT

SLS Sample no.	UTM east zone 6	UTM north zone 6	Lat. (dec. deg.)	Long (dec. deg.)	Lat (deg. min. sec.)	Long (deg. min. sec.)
7	395981	762547	68.72285461	-149.57153320	68 43 22.776598	-149 34 17.519520
8	395728	7622002	68.69184113	-149.57173157	68 41 30.620068	-149 34 18.233652
9	395699	7618343	68.65004999	-149.56867981	68 39 32.570964	-149 34 7.247316
10	3	396834	7610297	68.59738708	-149.53269003	68 35 14.593489
11	4	397592	7607079	68.55883026	-149.51081848	68 33 31.788936
12	5	392878	7620441	68.67677307	-149.64028931	68 40 36.383052
13	6*	391095	7624832	68.71542358	-149.68890381	68 42 55.524888
14	7	392128	7619920	68.67185211	-149.65997534	68 40 18.687598
15	8	393531	7617697	68.65244293	-149.62132263	68 39 8.794548
16	9	392551	7617207	68.64768219	-149.64489746	68 38 51.655884
17	10	394349	7603652	68.52692413	-149.58668518	68 31 36.926868
18	11	391690	7598787	68.49128723	-149.64762878	68 29 28.634028
19	12	414168	7605892	68.55376434	-149.10379028	68 33 13.551624
20	13	416811	7613377	68.62165070	-149.04513550	68 37 17.942520
21	14	417648	7619752	68.67903137	-149.02973938	68 40 44.512932
22	15	413922	7617197	68.65501404	-149.11933899	68 39 18.050544
23	16	412202	7615298	68.63745117	-149.16001892	68 38 14.824212
24	17	413089	7613513	68.62173462	-149.13668823	68 37 18.244632
25	18*	411509	7613262	68.61898041	-149.17549133	68 37 8.329476
26	19	409697	7602454	68.52155304	-149.21025085	68 31 17.590944
27	20	407804	7601180	68.50952148	-149.25540161	68 30 34.277328
28	21	405894	7602171	68.51776123	-149.30297852	68 31 3.940428
29	22	402769	7601775	68.51314545	-149.37898254	68 30 47.323620
30	23	402310	7601747	68.51273346	-149.39019775	68 30 45.840456
31	24*	405244	7605260	68.54522705	-149.32171631	68 32 42.817380
32	25	396577	7602284	68.51549530	-149.53083801	68 30 55.783080
33	26	398674	7600536	68.50059509	-149.47785950	68 30 2.142324
34	27					

Data Development
 Sampling Design
 Logistical Support
 Ancillary Analyses
 Data Archiving
 Real-Time Results

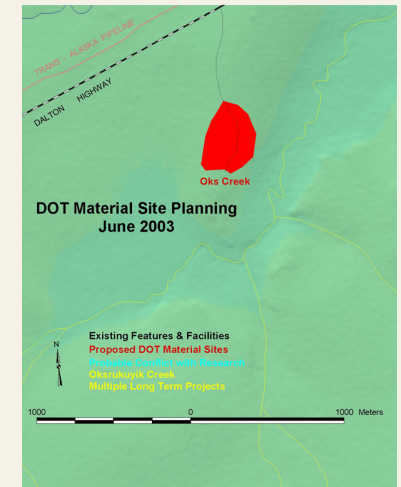
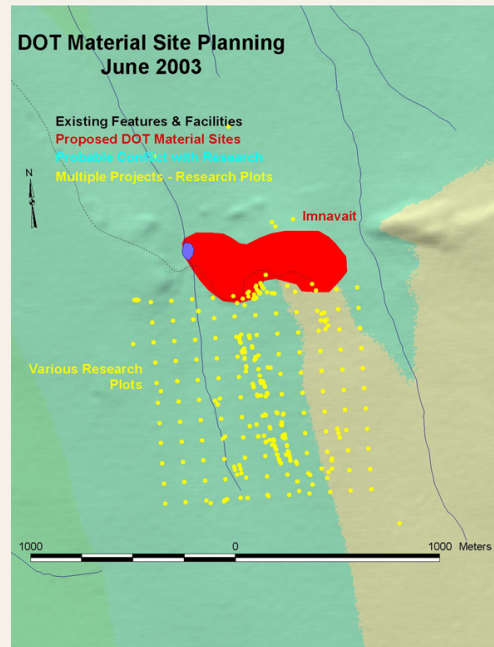
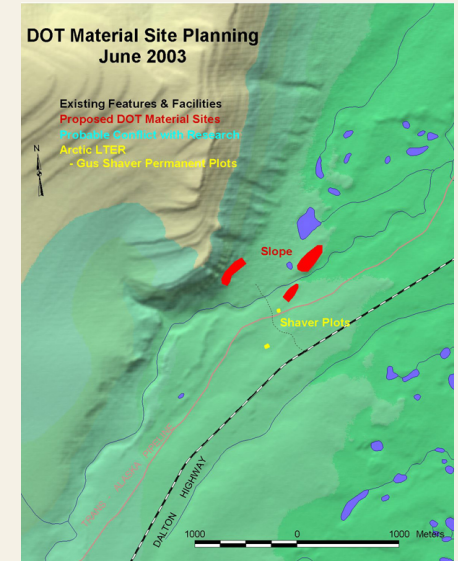
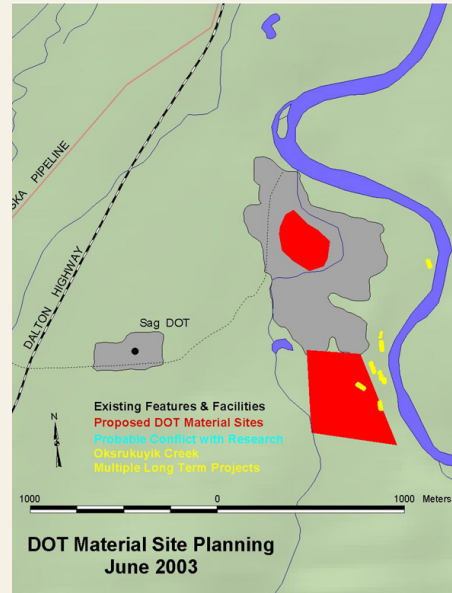
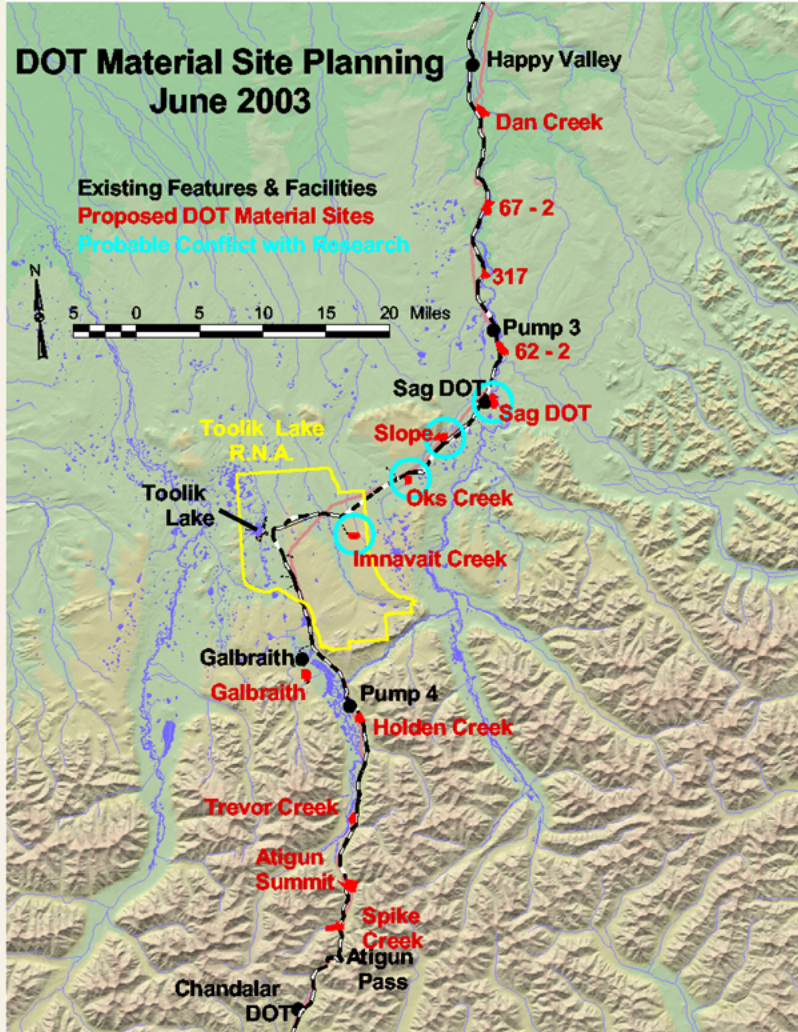
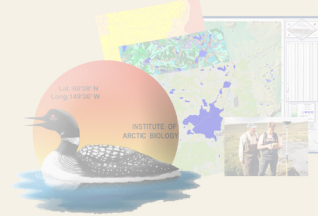


Stream Landscape Survey												
Site ID	Glacial phase	Lakes?	Geological period	Sample date	Latitude (NAD27) DMS	Longitude (NAD27) DMS	East UTM	North UTM	Mean Slope %	SD Slope %	Mean elevation m amsl	Elevation range low high m
1	Iktilik drift 1	lakeless	Early Wisconsin	6/18/2001	68 43 40.239264	-149 35 11.792004	395295	7626039	3.5	2.2	792	614 1097
2	Iktilik drift 1	lakeless	Early Wisconsin	6/18/2001								
3	Iktilik drift 1	lakeless	Early Wisconsin	6/18/2001								
4	Iktilik drift 1	lakeless	Early Wisconsin	6/18/2001								
5	Iktilik drift 1	lakeless	Early Wisconsin	6/18/2001								
6	Iktilik drift 2	lakes	Late Holocene	6/18/2001								
7	Iktilik drift 2	lakes	Late Holocene	6/18/2001								
8	Iktilik drift 2	lakes	Late Holocene	6/18/2001								
9	Iktilik drift 2	lakes	Late Holocene	6/18/2001								
10	Iktilik drift 2	lakes	Late Holocene	6/18/2001								
11	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
12	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
13	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
14	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
15	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
16	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
17	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
18	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
19	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
20	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
21	Iktilik drift 2	lakeless	Late Holocene	6/18/2001								
22	Iktilik drift 1	lakes	Early Wisconsin	6/18/2001								
23	Iktilik drift 1	lakes	Early Wisconsin	6/18/2001								
24	Iktilik drift 1	lakes	Early Wisconsin	6/18/2001								
25	Iktilik drift 1	lakes	Early Wisconsin	6/18/2001								
26	Iktilik drift 1	lakes	Early Wisconsin	6/18/2001								
27	Iktilik drift 1	lakes	Early Wisconsin	6/18/2001								
28	Near bedrock	lakeless	recent?									
29	Near bedrock	lakeless	recent?									
30	Near bedrock	lakeless	recent?									
31	Near bedrock	lakeless	recent?									
32	Near bedrock	lakeless	recent?									
33	Iktilik drift latest	lakeless	Late Holocene									
34	Iktilik drift latest	lakeless	Late Holocene	6/18/2001								
35	Iktilik drift latest	lakeless	Late Holocene									
36	Iktilik drift latest	lakeless	Late Holocene									
37	Iktilik drift latest	lakeless	Late Holocene									
38	Sann drift	lakeless	Middle Pleistocene									

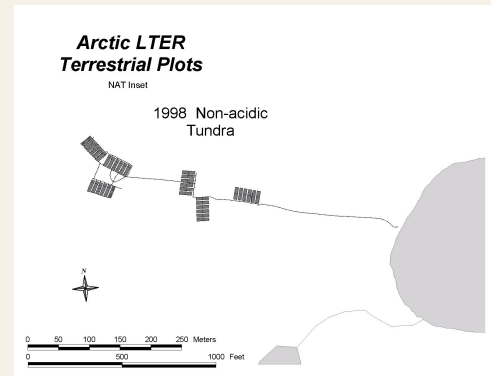
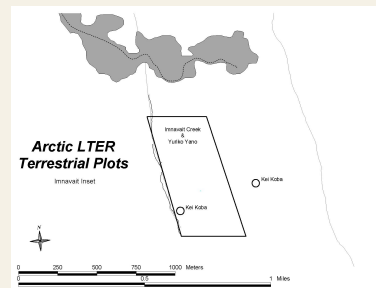
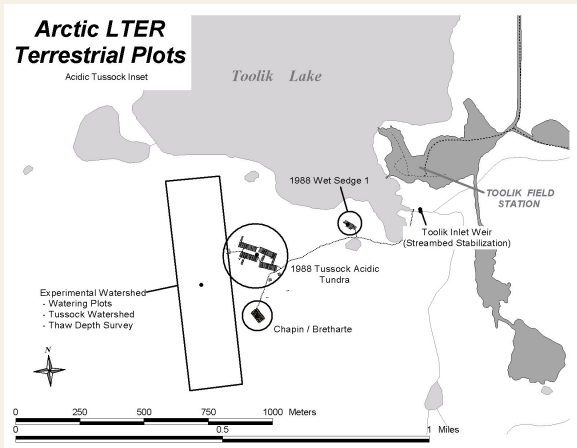
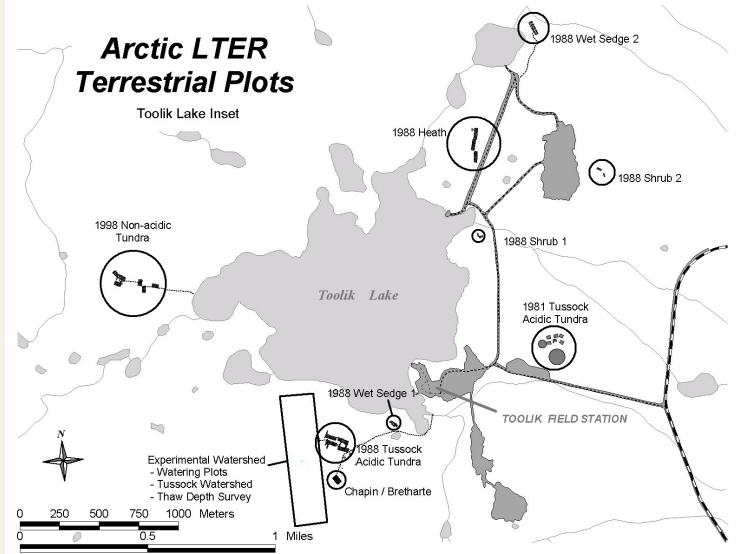
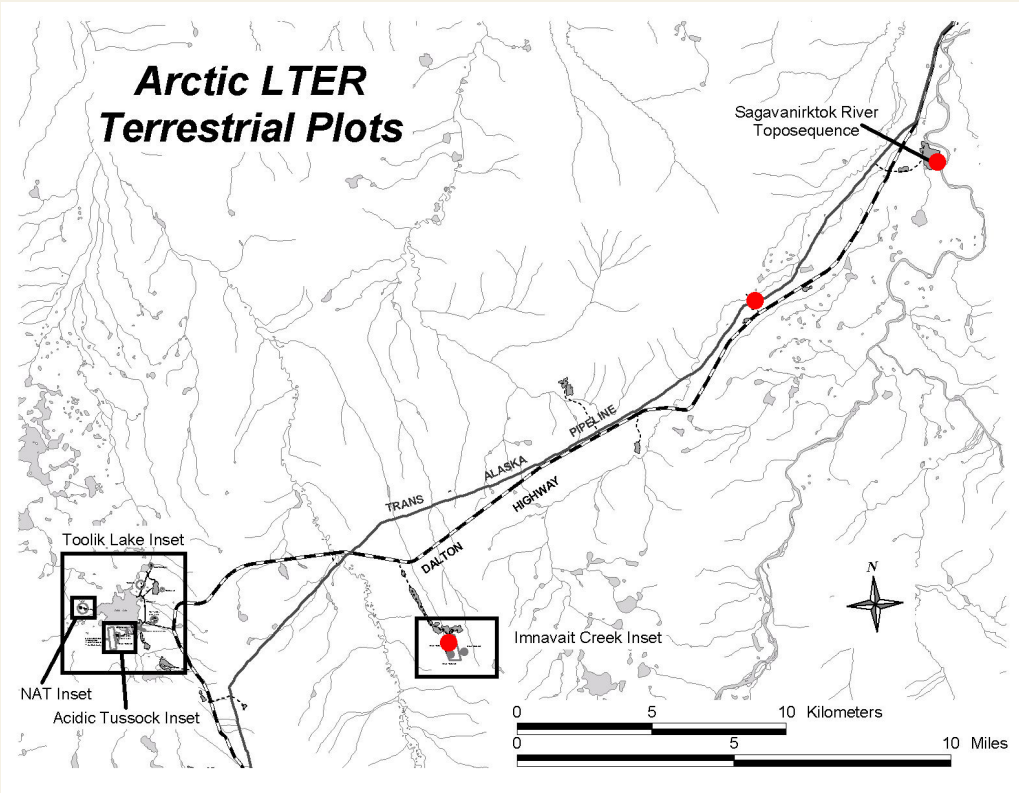


Stream Landscape Survey													Physical survey				Apparent		Bank vegetation			
Site ID	Glacial phase	Lakes?	Drainage density km ²	Land:Wtr Ratio dim/less	Stream Morph 4 classes	Water depth cm	Water width cm	Channel D:W ratio 3 classes	Channel shape 3 classes	stream order no.	wet sedge %	moist tussock %	willow scrub %	dry heath %								
8	Iktilik drift 1	lakeless	1.12	152: 1	braided	?	?	<1:1	irregular	2	0	50	50	0								
9	Iktilik drift 1	lakeless	1.12	152: 1	beaded	10	50	<1:1	box	2	30	40	30	0								
10	Iktilik drift 1	lakeless	1.12	152: 1	meander	10	100	<1:1	U	2	0	90	10	0								
11	Iktilik drift 1	lakeless	1.12	152: 1																		
12	Iktilik drift 1	lakeless	1.12	152: 1																		
13	Iktilik drift 2	lakes	0.51	9: 1																		
14	Iktilik drift 2	lakes	0.51	9: 1	meander	15	100	"1:1	irregular	2	20	50	30	0								
15	Iktilik drift 2	lakes	0.51	9: 1	beaded	50, 110	50, 15	"1:1	U	3	60	5	35	0								
16	Iktilik drift 2	lakes	0.51	9: 1	meander	20	30	"1:1	U	1	95	0	5	0								
17	Iktilik drift 2	lakes	0.51	9: 1		15	100	<1:1	box	3	100	0	0	0								
18	Iktilik drift 2	lakeless	0.73	59: 1																		
19	Iktilik drift 2	lakeless	0.73	59: 1																		
20	Iktilik drift 2	lakeless	0.73	59: 1	meander	20	80	<1:1	irregular	2	0	0	100	0								
21	Iktilik drift 2	lakeless	0.73	59: 1	meander	20	60	<1:1	irregular	3	10	0	90	0								
22	Iktilik drift 2	lakeless	0.73	59: 1	meander	10	60	"1:1	U	2	0	90	10	0								
23	Iktilik drift 1	lakes	0.80	16: 1	beaded	40	40	"1:1	U	2	0	50	50	0								
24	Iktilik drift 1	lakes	0.80	16: 1	braided	30	60	<1:1	U	1	95	0	5	0								
25	Iktilik drift 1	lakes	0.80	16: 1																		
26	Iktilik drift 1	lakes	0.80	16: 1	meander	30	50	<1:1	U	1	70	30	0	0								
27	Iktilik drift 1	lakes	0.80	16: 1																		
28	Near bedrock	lakeless	0.89	36: 1																		
29	Near bedrock	lakeless	0.89	36: 1																		
30	Near bedrock	lakeless	0.89	36: 1																		
31	Near bedrock	lakeless	0.89	36: 1																		
32	Near bedrock	lakeless	0.89	36: 1																		
33	Iktilik drift latest	lakeless	0.60	281: 1																		
34	Iktilik drift latest	lakeless	0.60	281: 1	meander	2	25	<1:1	irregular	1	0	50	50	0								
35	Iktilik drift latest	lakeless	0.60	281: 1																		
36	Iktilik drift latest	lakeless	0.60	281: 1																		
37	Iktilik drift latest	lakeless	0.60	281: 1																		
38	Sann drift	lakeless	0.82	468: 1																		

Management Support – Agency Interactions / Conflict Prevention



Management Support – Agency Interactions / Permit Renewal

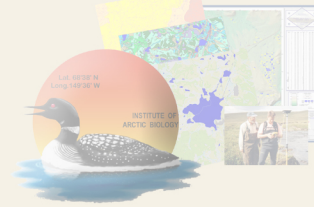


Glacial Geology of Toolik Lake and the Upper Kuparuk River Region

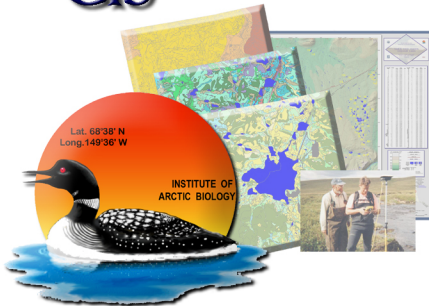
by Thomas D. Hamilton



Output Products

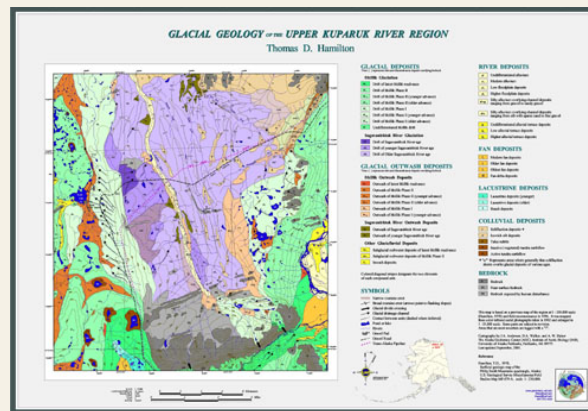
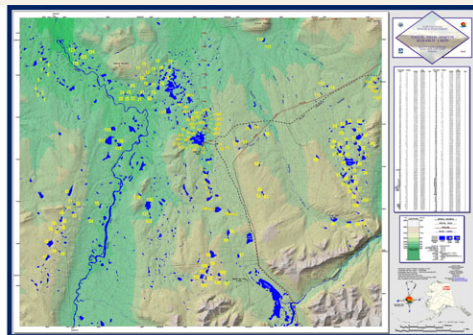
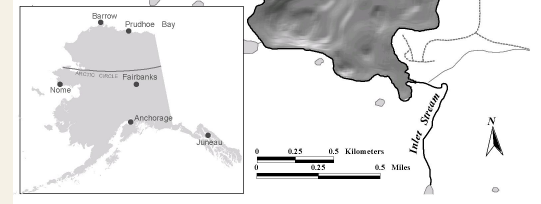
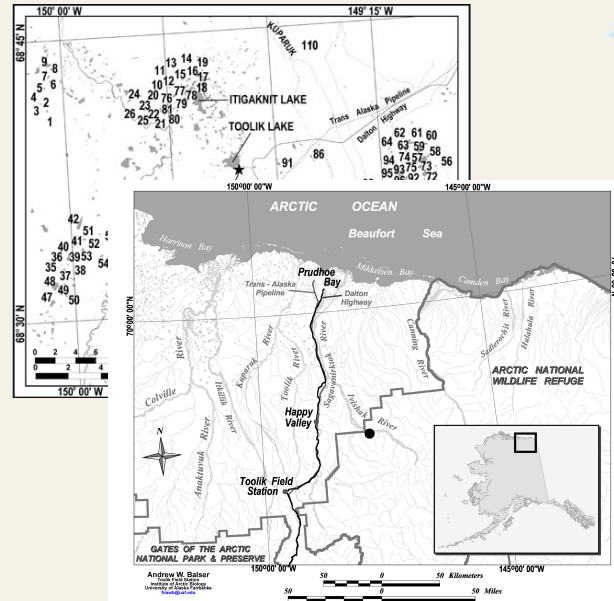


TOOLIK FIELD STATION GIS



ANNUAL REPORT
2002

Andrew W. Balsler, GIS & Remote Sensing Manager
Institute of Arctic Biology
University of Alaska Fairbanks
December 9, 2002





Toolik Natural Resource Tool

Think of the landscape as a natural resource for science . . .

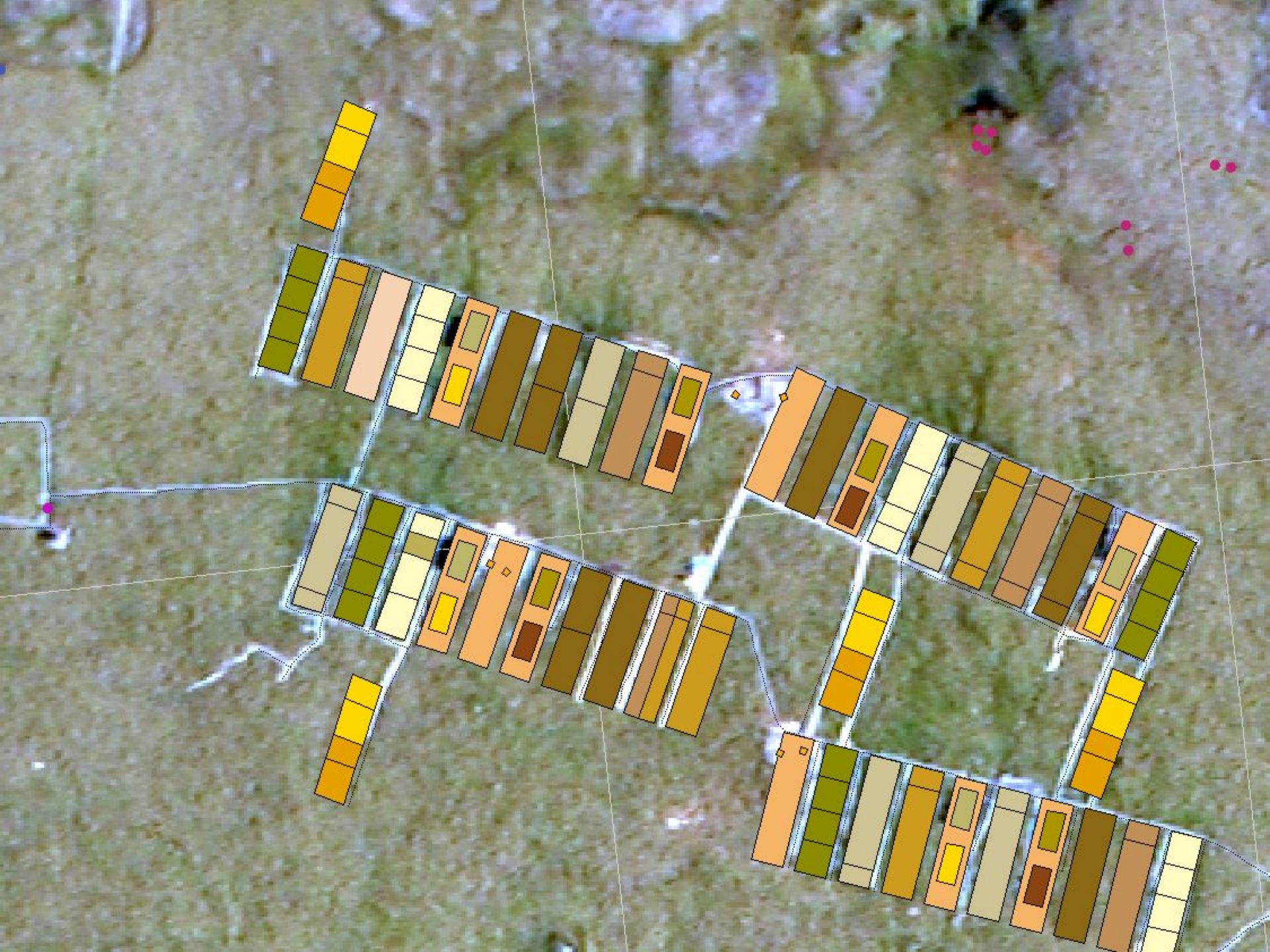
- limited resources
- undisturbed landscape is non-renewable within our time context

Maximize the benefits of resource consumption . . .

- prevent inappropriate co-location
- help identify natural synergies among projects

Other benefits . . .

- conservation biology
- responsible stewardship
- much better interaction with other stakeholders

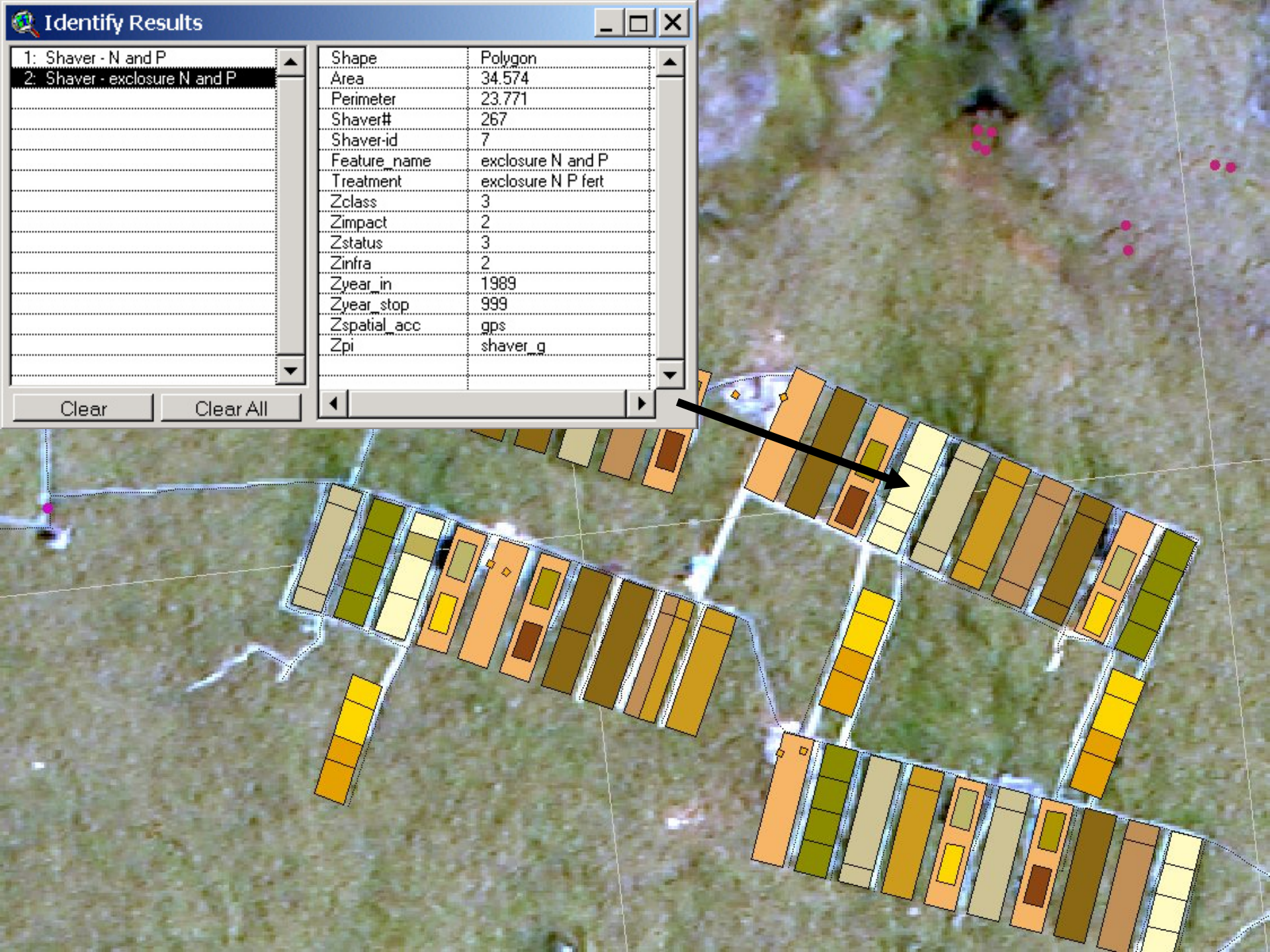


Identify Results

- 1: Shaver - N and P
- 2: Shaver - enclosure N and P

Shape	Polygon
Area	34.574
Perimeter	23.771
Shaver#	267
Shaver-id	7
Feature_name	exclosure N and P
Treatment	exclosure N P fert
Zclass	3
Zimpact	2
Zstatus	3
Zinfra	2
Zyear_in	1989
Zyear_stop	999
Zspatial_acc	gps
Zpi	shaver_g

Clear Clear All



Toolik Natural Resource Tool



Research Classification Scheme:

5 Basic Classes

- 0 - (Presumed) Undisturbed Landscape
- 1 - Single Observation
- 2 - Repeated Observation
- 3 - Manipulative
- 4 - Destructive
- 5 - Manipulative & Destructive

3 Level of Status

- 1 – Active
- 2 – Inactive
- 3 – Abandoned

4 Levels of Activity/Impact

- 1 – Low Intensity
- 2 – High Intensity
- 3 – Isotope Addition, Stable
- 4 – Isotope Addition, Radioactive

3 Levels of Infrastructure

- 0 – None
- 1 – Pin flags/Stakes/Markers
- 2 – Structures / Equipment

Identify Results

1: Shaver - N and P
2: Shaver - enclosure N and P

Shape	Polygon
Area	34.574
Perimeter	23.771
Shaver#	267
Shaver-id	7
Feature_name	exclosure N and P
Treatment	exclosure N P fert
Zclass	3
Zimpact	2
Zstatus	3
Zinfra	2
Zyear_in	1989
Zyear_stop	999
Zspatial_acc	gps
Zpi	shaver_g

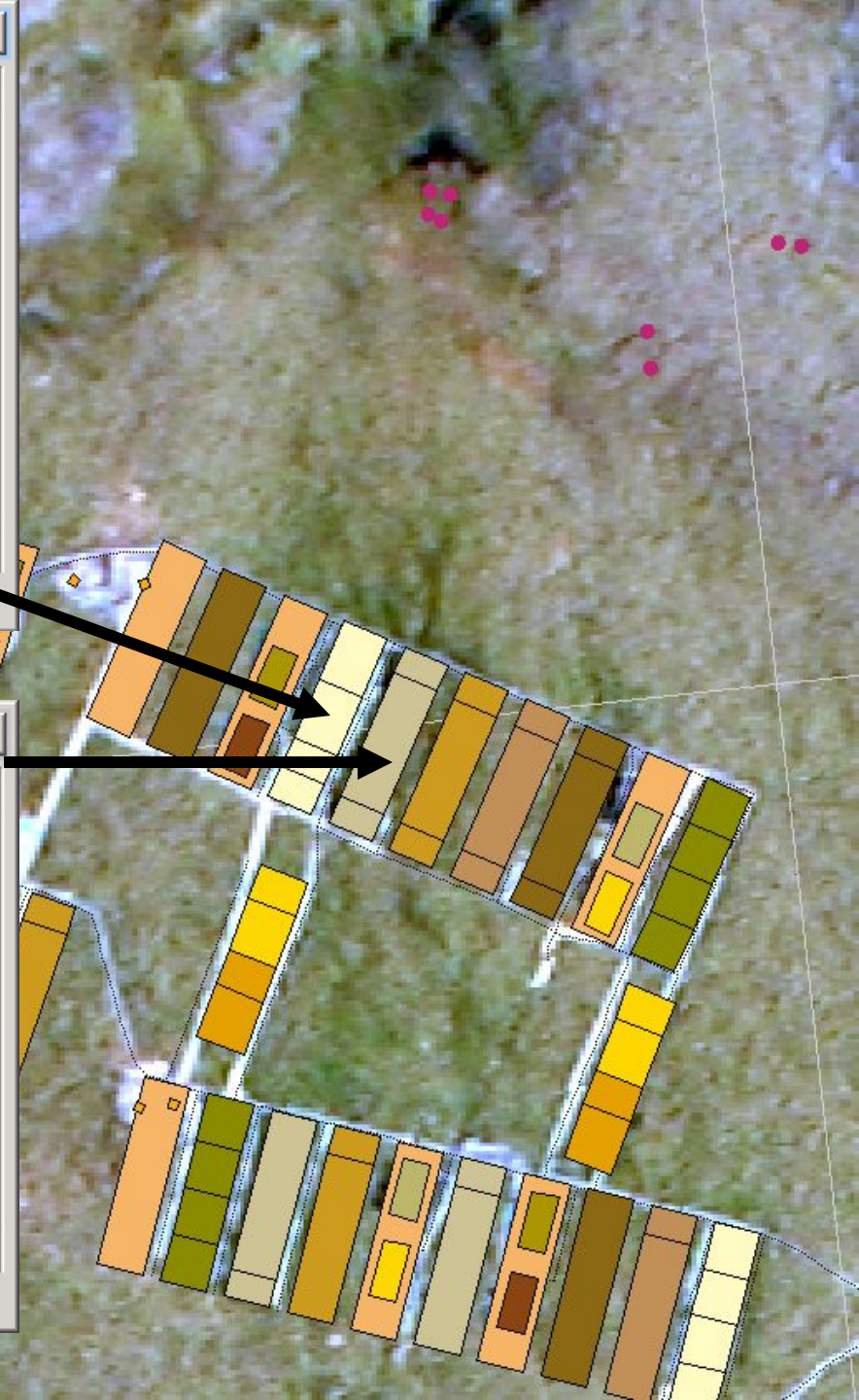
Clear Clear All

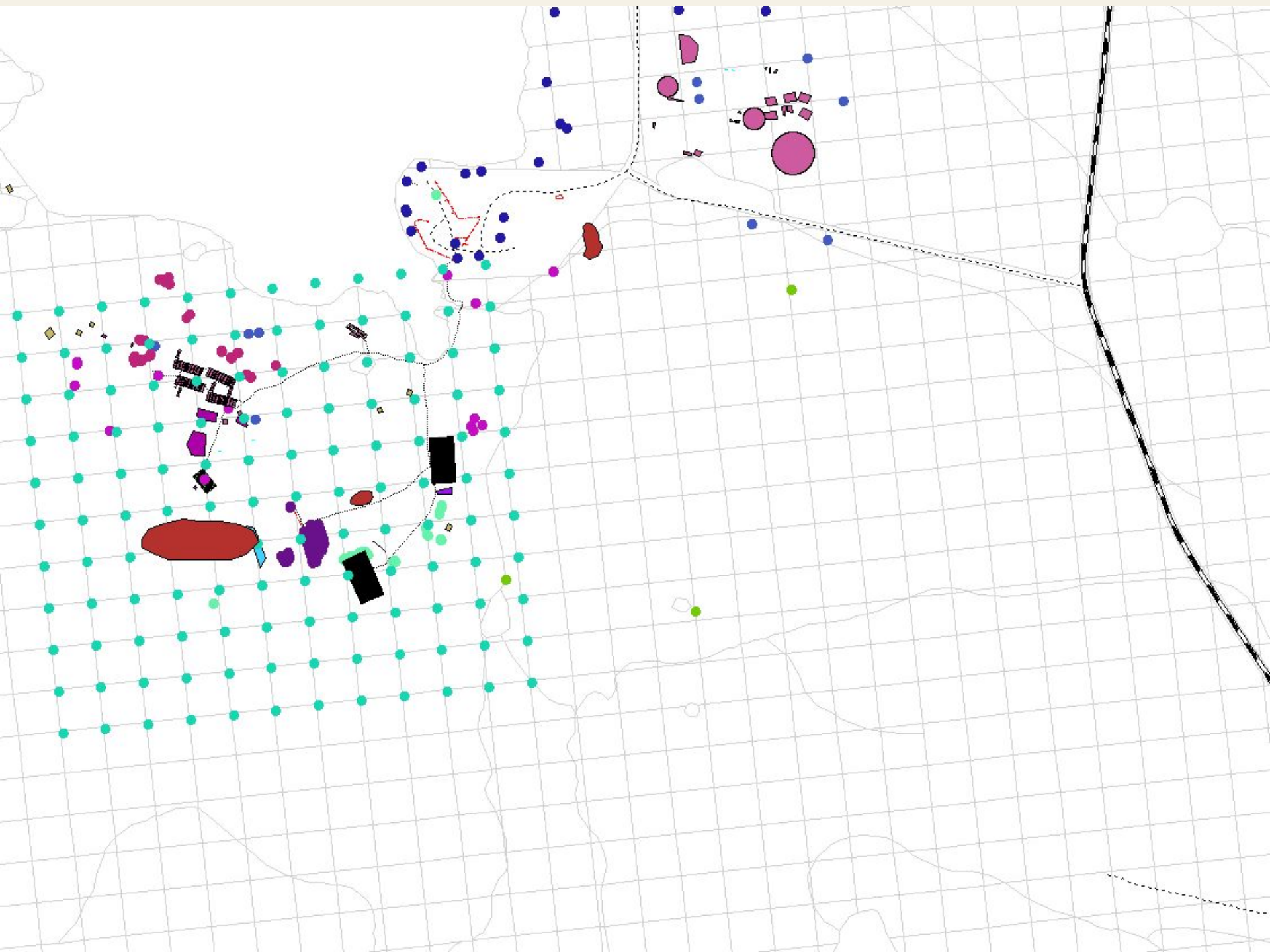
Identify Results

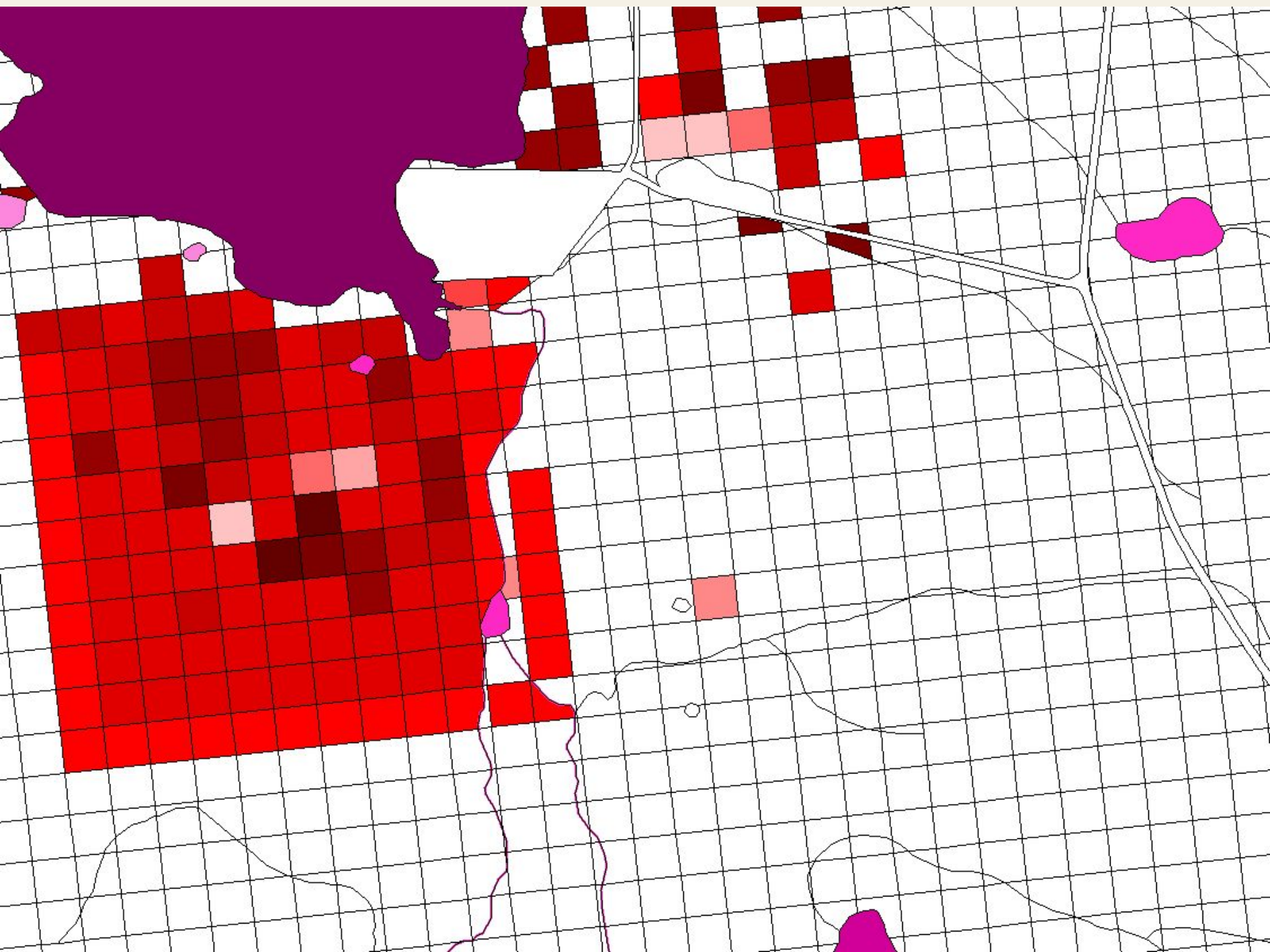
1: Shaver - N and P
2: Shaver - enclosure N and P

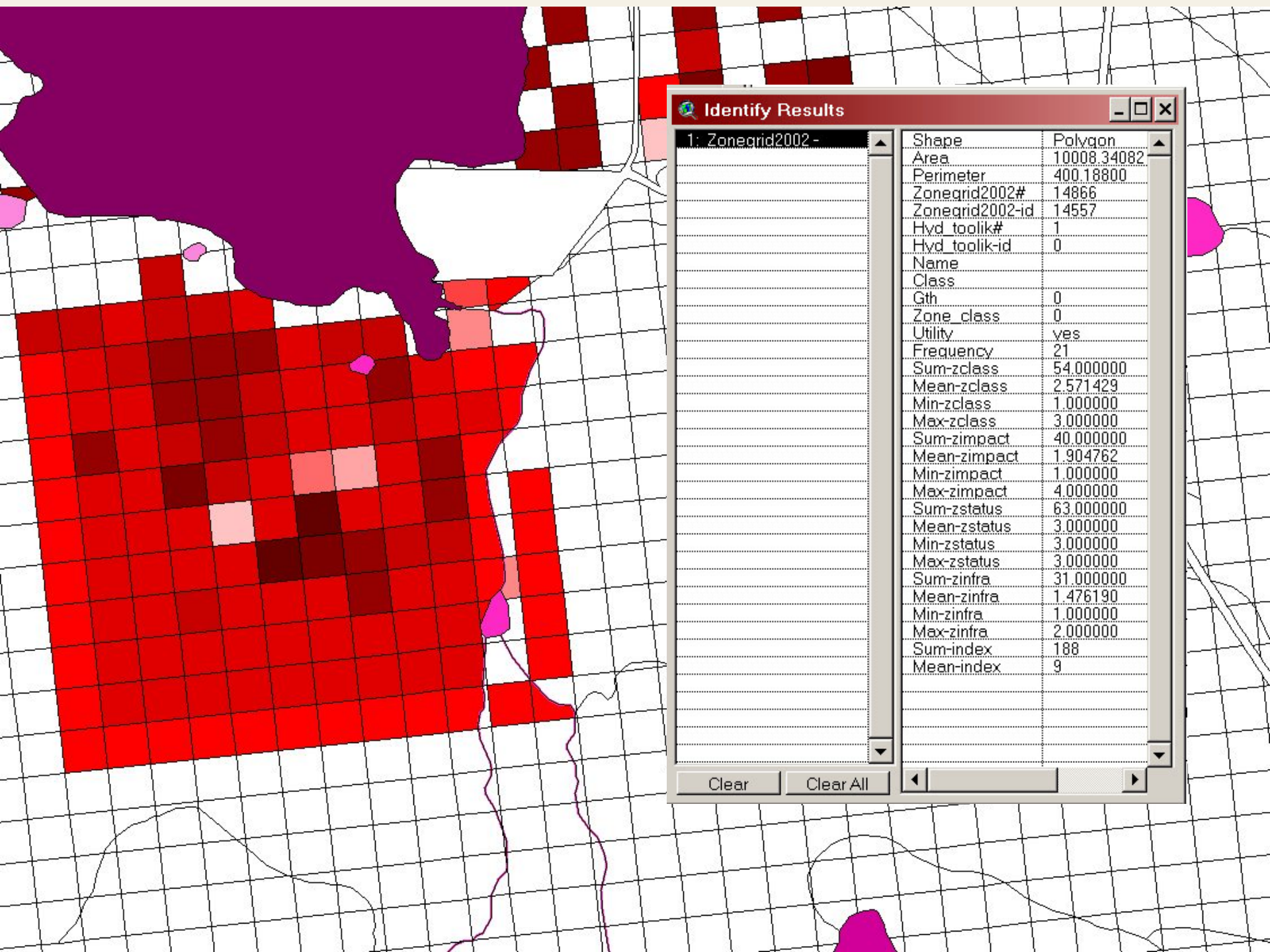
Shape	Polygon
Area	73.434
Perimeter	39.064
Shaver#	265
Shaver-id	6
Feature_name	N and P
Treatment	N P fert
Zclass	3
Zimpact	2
Zstatus	3
Zinfra	1
Zyear_in	1989
Zyear_stop	999
Zspatial_acc	gps
Zpi	shaver_g

Clear Clear All







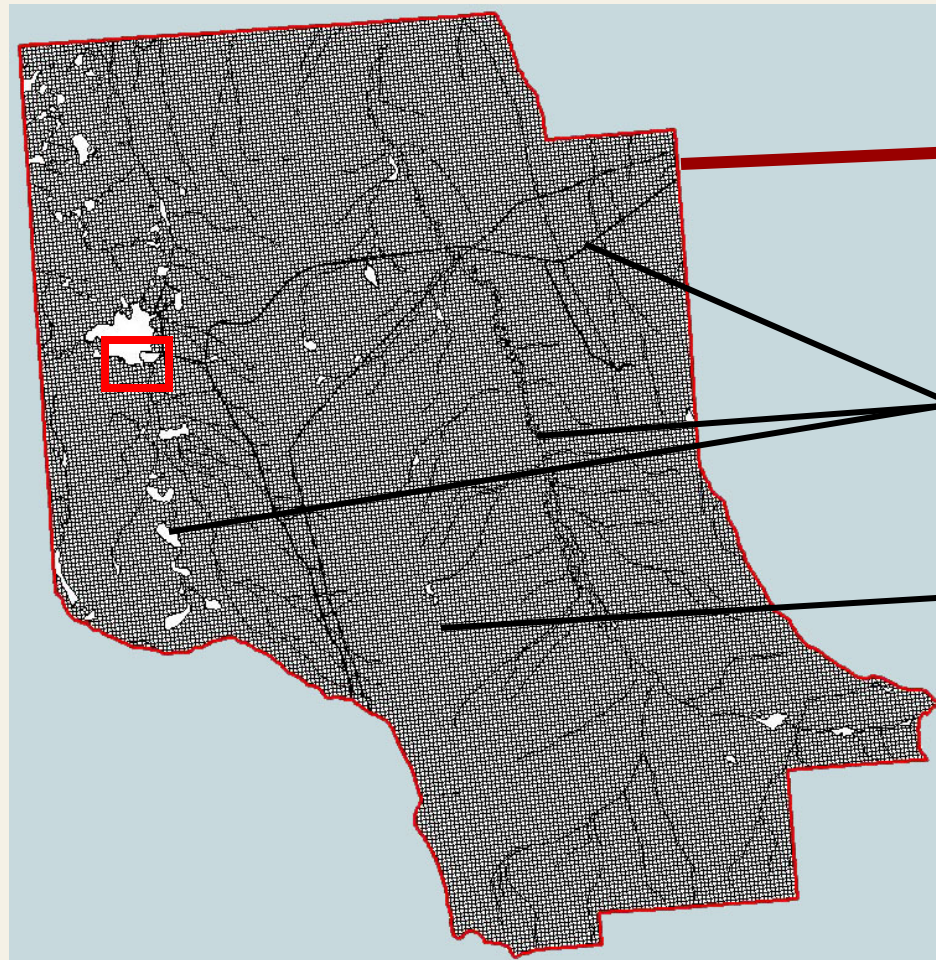
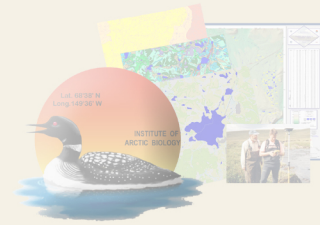


Identify Results

1: Zonegrid2002 -

Shape	Polygon
Area	10008.34082
Perimeter	400.18800
Zonegrid2002#	14866
Zonegrid2002-id	14557
Hvd_toolik#	1
Hvd_toolik-id	0
Name	
Class	
Gth	0
Zone_class	0
Utility	yes
Frequency	21
Sum-zclass	54.000000
Mean-zclass	2.571429
Min-zclass	1.000000
Max-zclass	3.000000
Sum-zimpact	40.000000
Mean-zimpact	1.904762
Min-zimpact	1.000000
Max-zimpact	4.000000
Sum-zstatus	63.000000
Mean-zstatus	3.000000
Min-zstatus	3.000000
Max-zstatus	3.000000
Sum-zinfra	31.000000
Mean-zinfra	1.476190
Min-zinfra	1.000000
Max-zinfra	2.000000
Sum-index	188
Mean-index	9

Clear Clear All

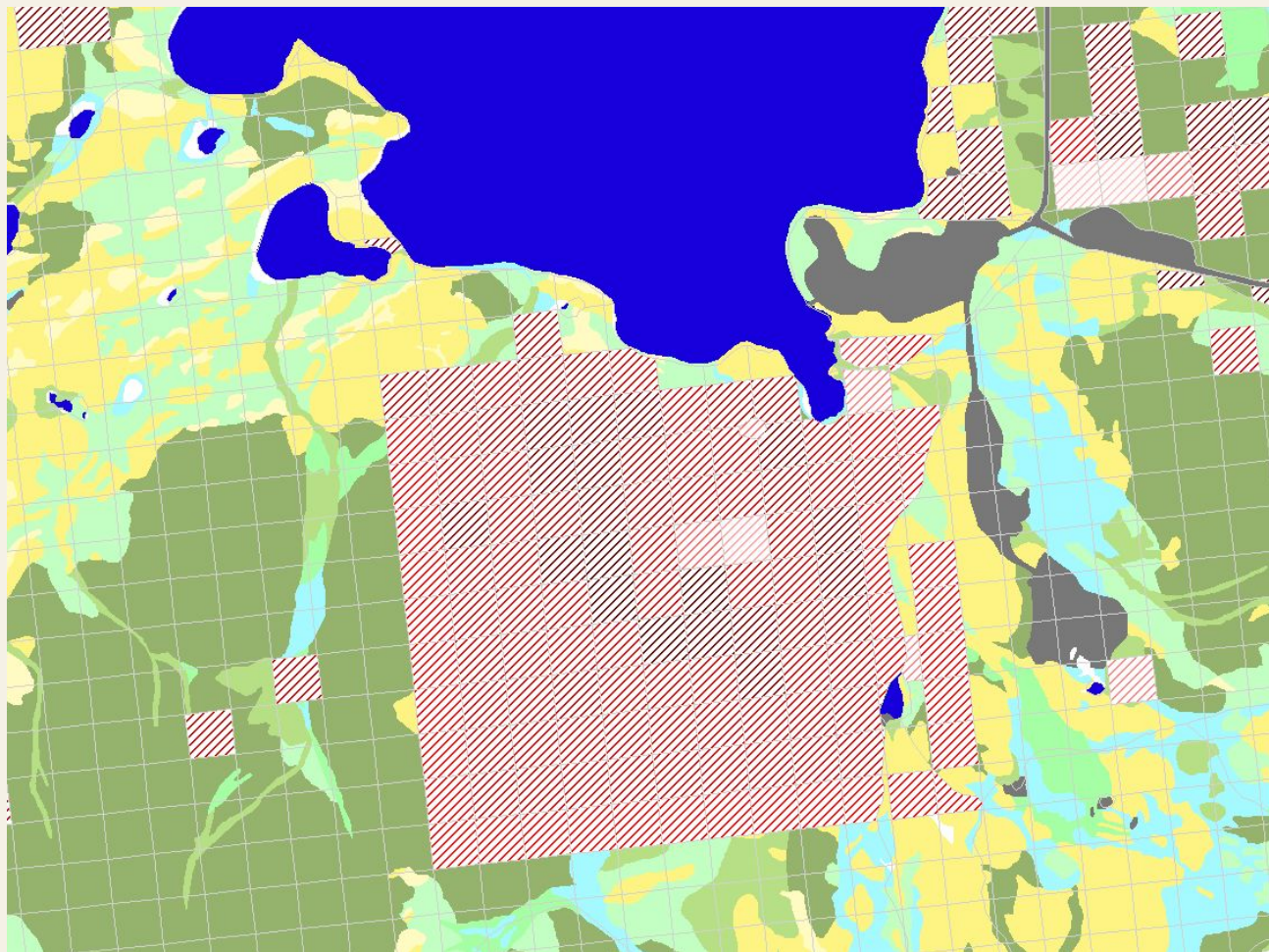


Toolik Lake Research Natural Area

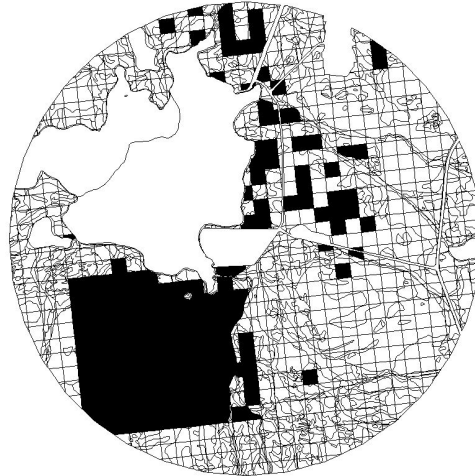
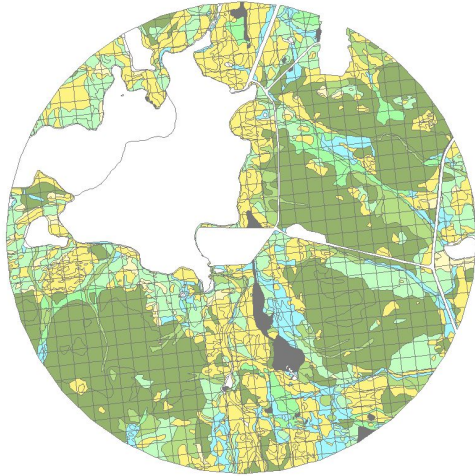
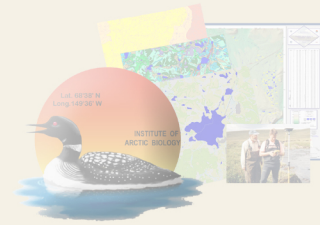
Physical features

Grid cells (100m x 100m)

Toolik Natural Resource Tool



Toolik Natural Resource Tool – Zoning Application

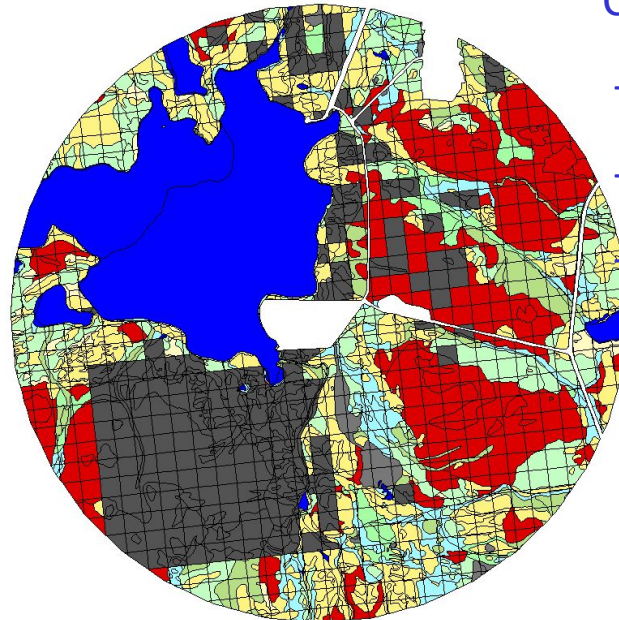
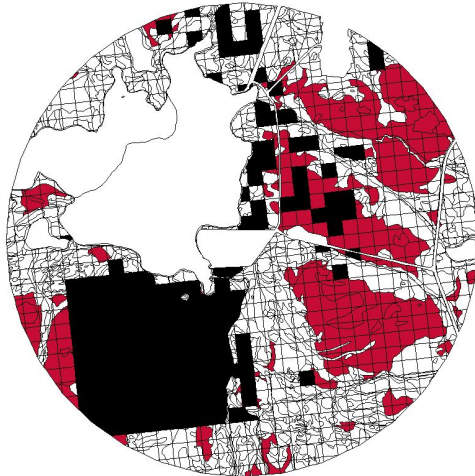


Goal:

- preserve some tundra

Criteria:

- within 1 mile of camp
- Moist Acidic Tundra
- not yet disturbed



Toolik Natural Resource Tool – Larger Picture



BLM's approach represents a progressive view and a golden opportunity

We will likely get only one chance to do this right

Public perception is potentially crucial and can't be mishandled

Community involvement is also crucial

Web content:

Interactive site-selection & permitting tool

IMS for conveying general information