Science, Service, Stewardship

CloudMapper - oceanographic data in the cloud (eventually)

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Motivation

- Existing Access databases
- Outdated, hard to maintain, poor geospatial analysis capabilities
- Single Oracle database
- Map-based interface
- Enhanced analysis capabilities
- Future deployment on cloud resources

Ecosystems and Fisheries-Oceanography Coordinated Investigations (EcoFOCI)

At-sea trawl (Field) and individual-fish (Lab) data

Currently available options

1) input data using forms

Field data	Lab data
Haul	Length-weight
Catch	Stomach content-weight
Length	Diet

2) retrieve data by cruise

Haul
Catch
Length
Length-weight
Stomach content-weight
Diet

3) retrieve documents about each cruise, data notes, table and field descriptions, and publications based on these data

Documents | Notes | Tables | Fields

4) go directly to the database

Database

5) quit Access

Quit Access

FIELD DATA

LAB DATA

FOCI Ichthyoplankton Database

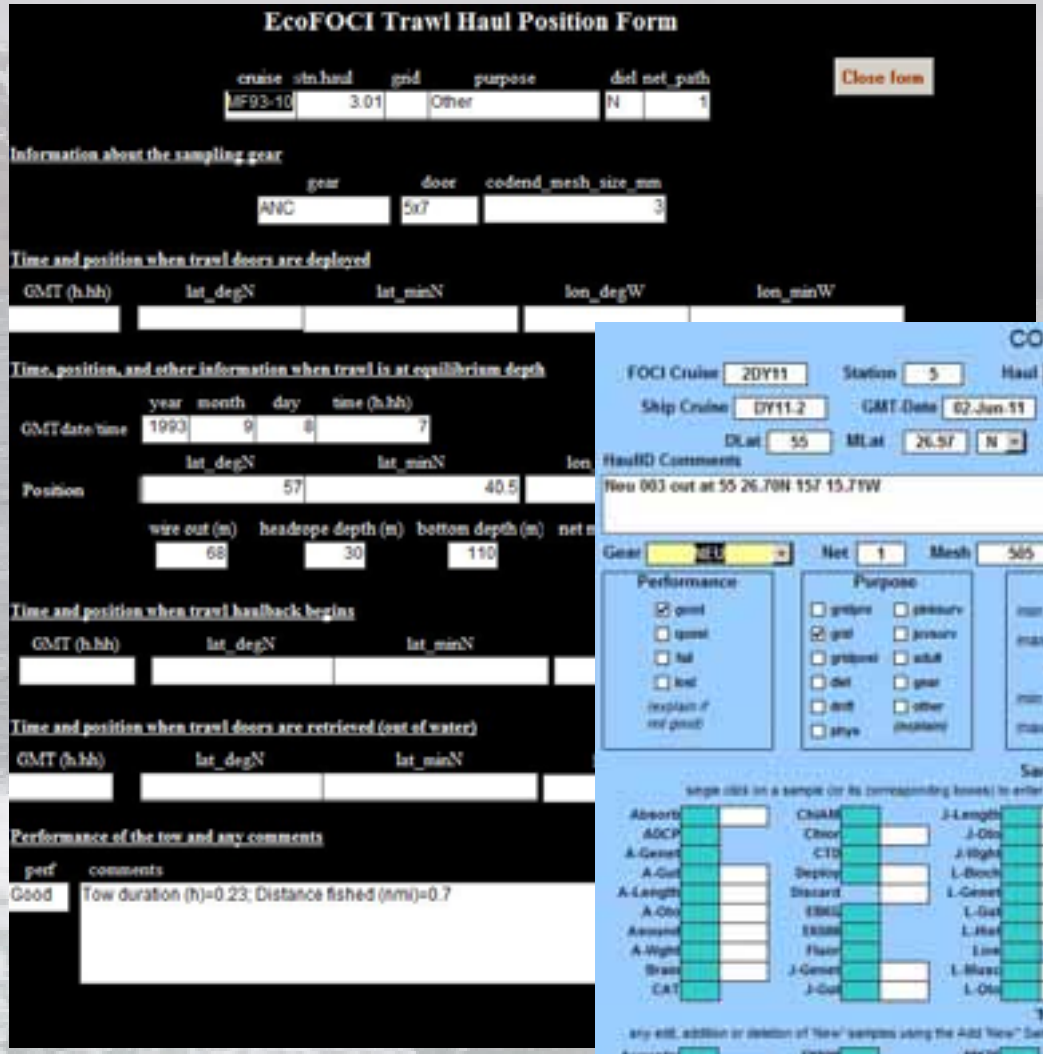
- Data search
- View data by station sheets
- Species rank data by percent occurrence
- Plot species occurrence
- View ichthyoplankton dictionary

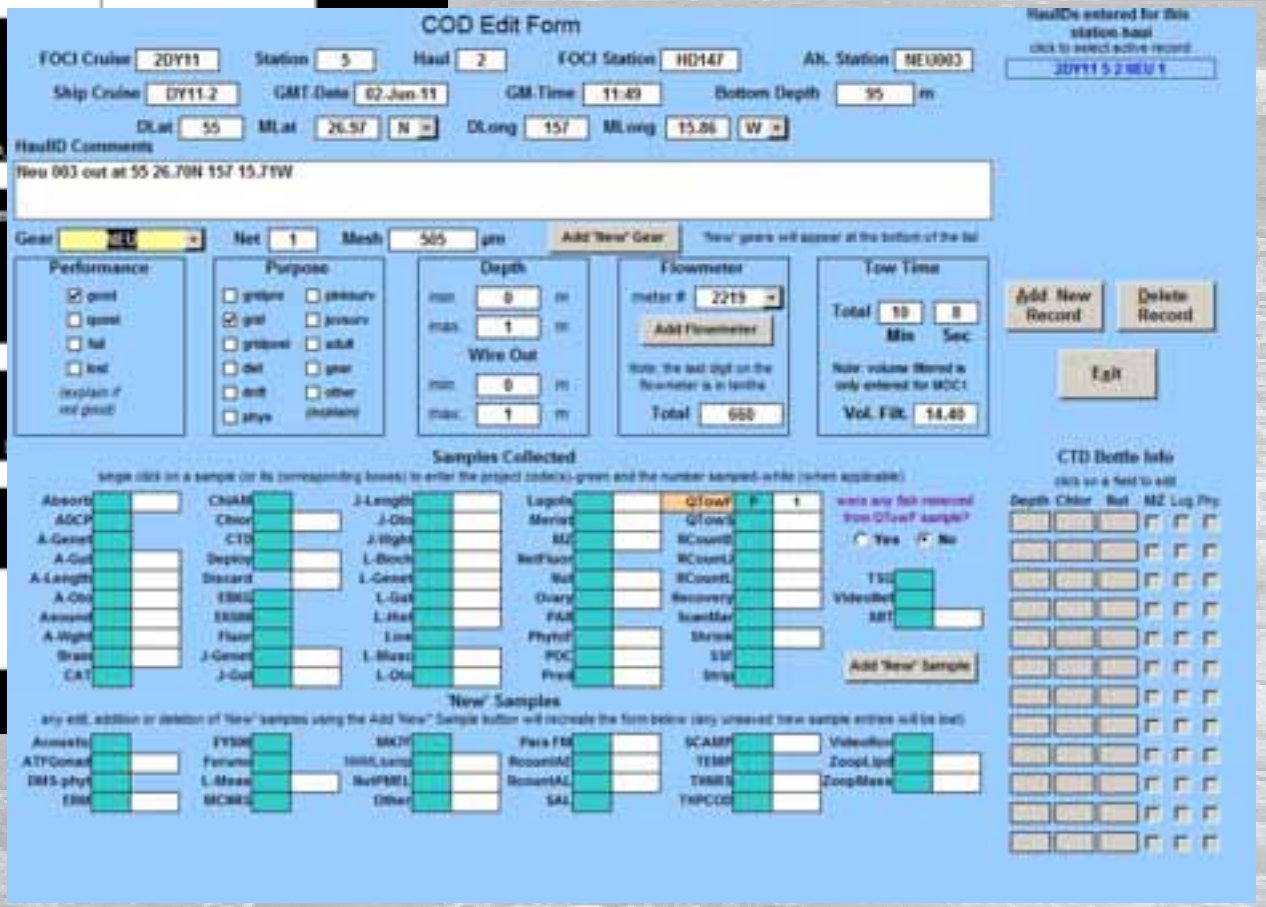
...es

...hs for a species

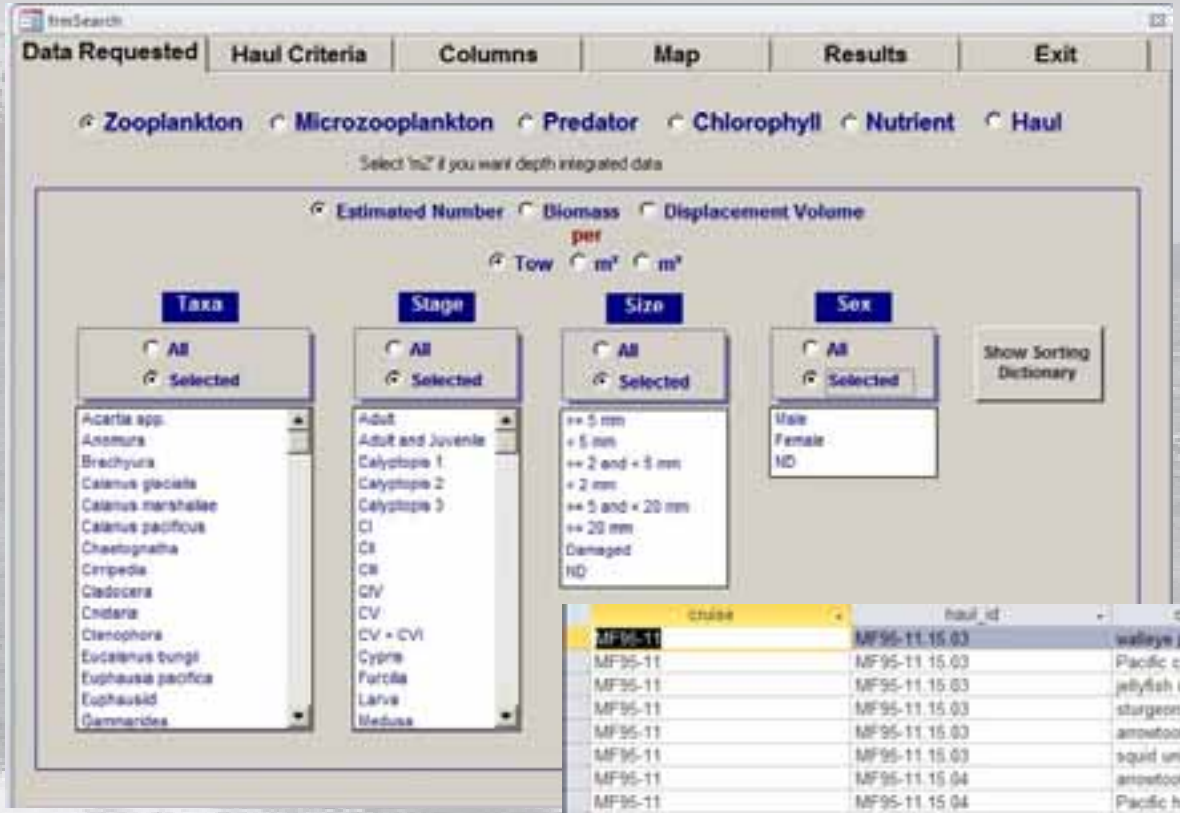
Biological Oceanography Database

Data entry and selection



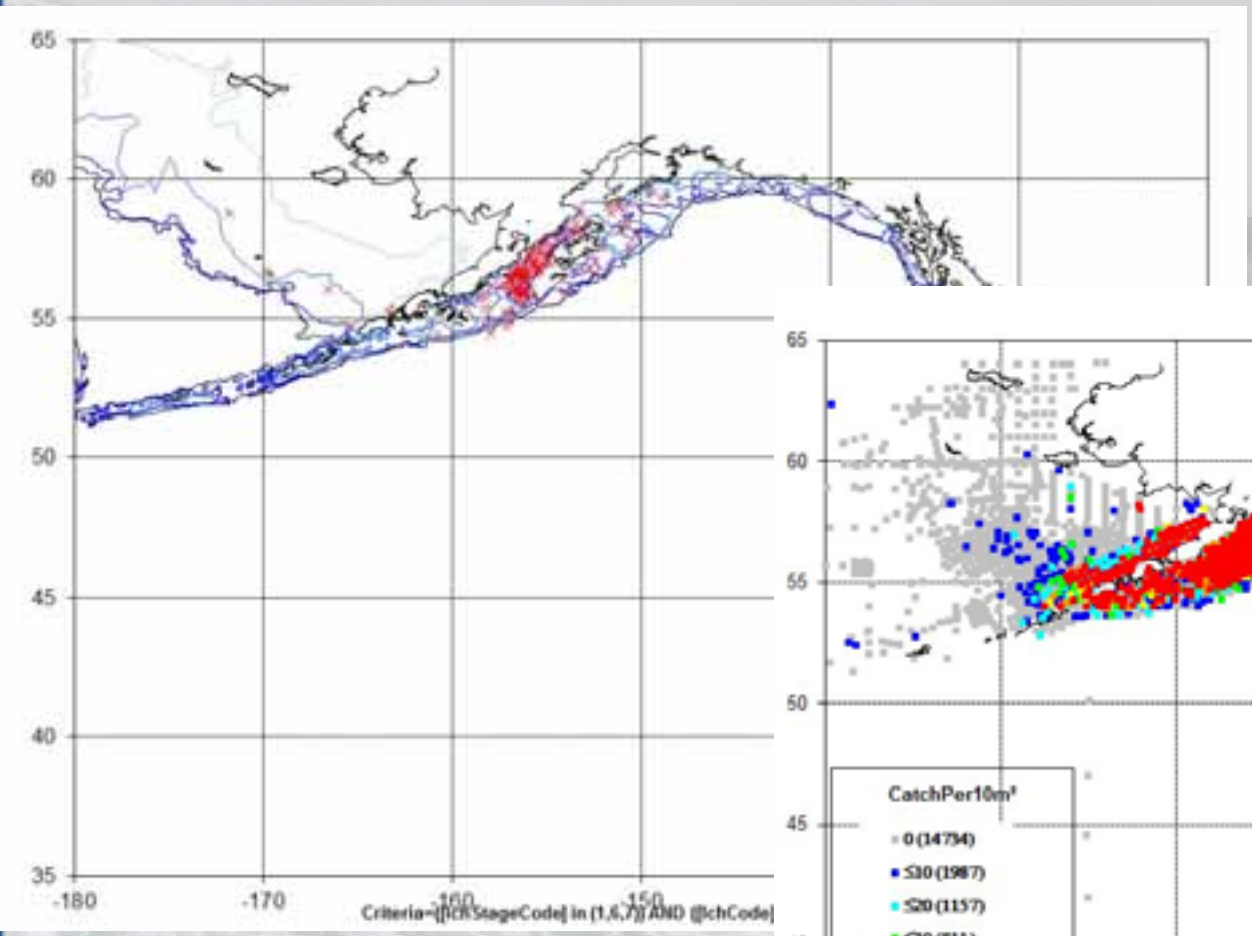


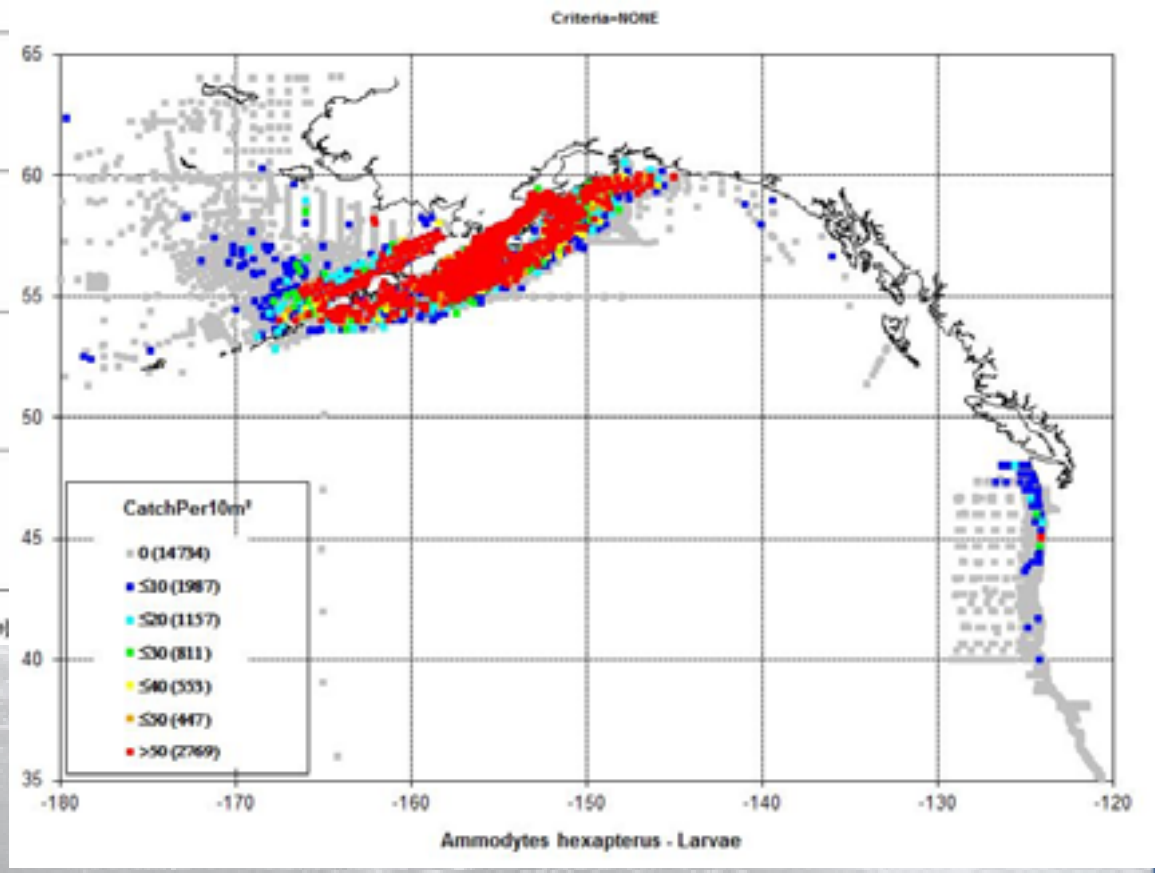
Tabular output



cruise	haul_id	common_name	sample_weight_units	non_subsample_weight	sub
MF95-11	MF95-11.15.03	walleye pollock, age-0	g	2964	
MF95-11	MF95-11.15.03	Pacific cod	g		
MF95-11	MF95-11.15.03	jellyfish unident.	g	46800	
MF95-11	MF95-11.15.03	sturgeon poacher	g		
MF95-11	MF95-11.15.03	arrowtooth flounder	g		
MF95-11	MF95-11.15.03	squid unident.	g		
MF95-11	MF95-11.15.04	arrowtooth flounder	kg	0	
MF95-11	MF95-11.15.04	Pacific halibut	kg	0	
MF95-11	MF95-11.15.04	rock sole spp.	kg	175.3	
MF95-11	MF95-11.15.04	sturgeon poacher	kg	0	
MF95-11	MF95-11.15.04	yellow Irish lord	kg	0	
MF95-11	MF95-11.15.04	Myoxocephalus polyacanthoceph.	kg	0	
MF95-11	MF95-11.15.04	Pacific cod	kg	0	
MF95-11	MF95-11.15.04	walleye pollock, juv	kg	0	
MF95-11	MF95-11.15.04	jellyfish unident.	kg	127	
MF95-11	MF95-11.15.04	Paralithodes platypus	kg	0	
MF95-11	MF95-11.15.04	Enmacrus isenbeckii	kg	0	
MF95-11	MF95-11.15.04	Asteroas spp.	kg	0	
MF95-11	MF95-11.15.04	shab	kg	1.3	
MF95-11	MF95-11.16.03	walleye pollock, age-0	g	24290	
MF95-11	MF95-11.16.03	jellyfish unident.	g	129600	
MF95-11	MF95-11.16.03	sturgeon poacher	g		

Rudimentary mapping

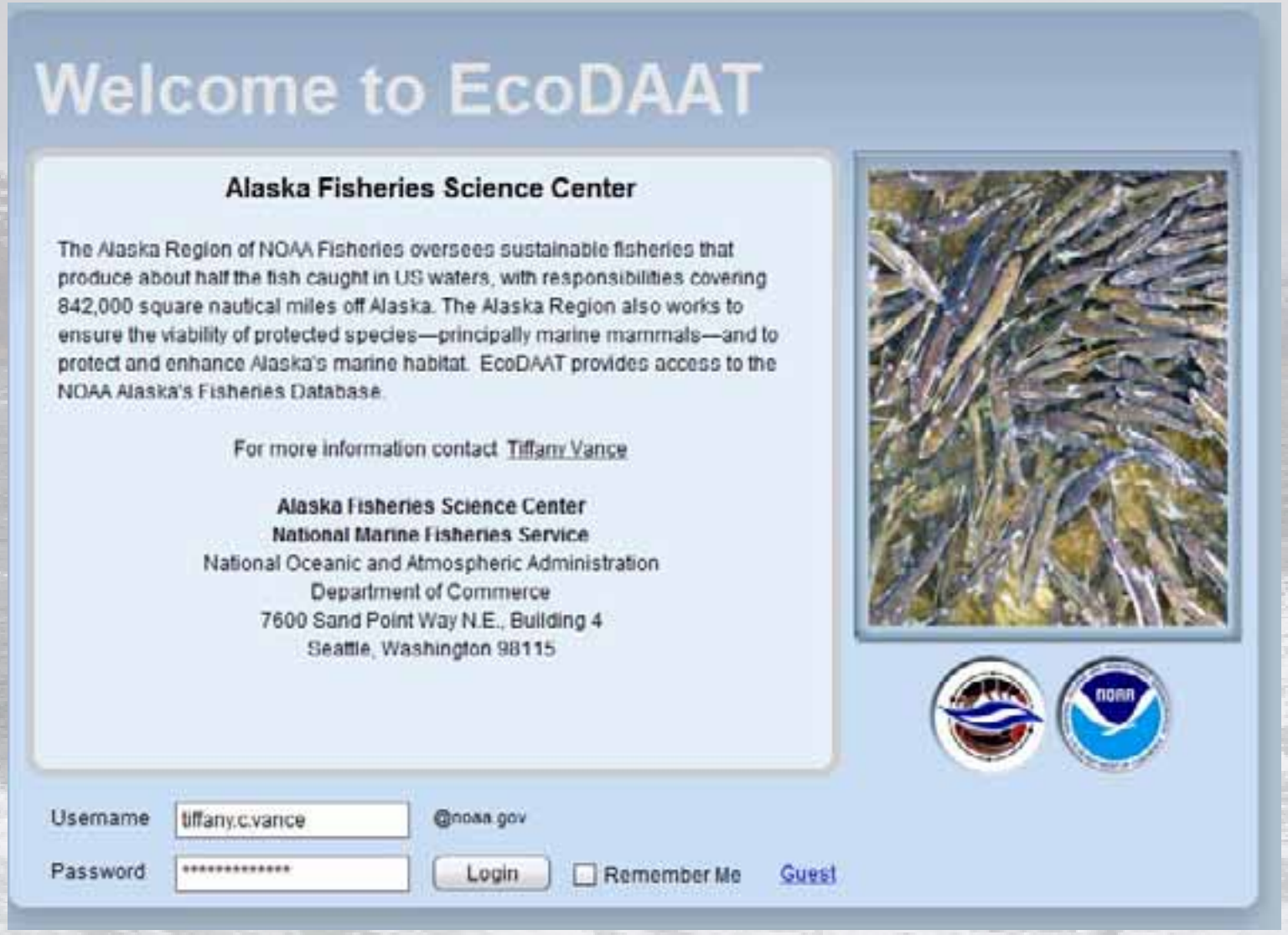




CSV file for further analysis

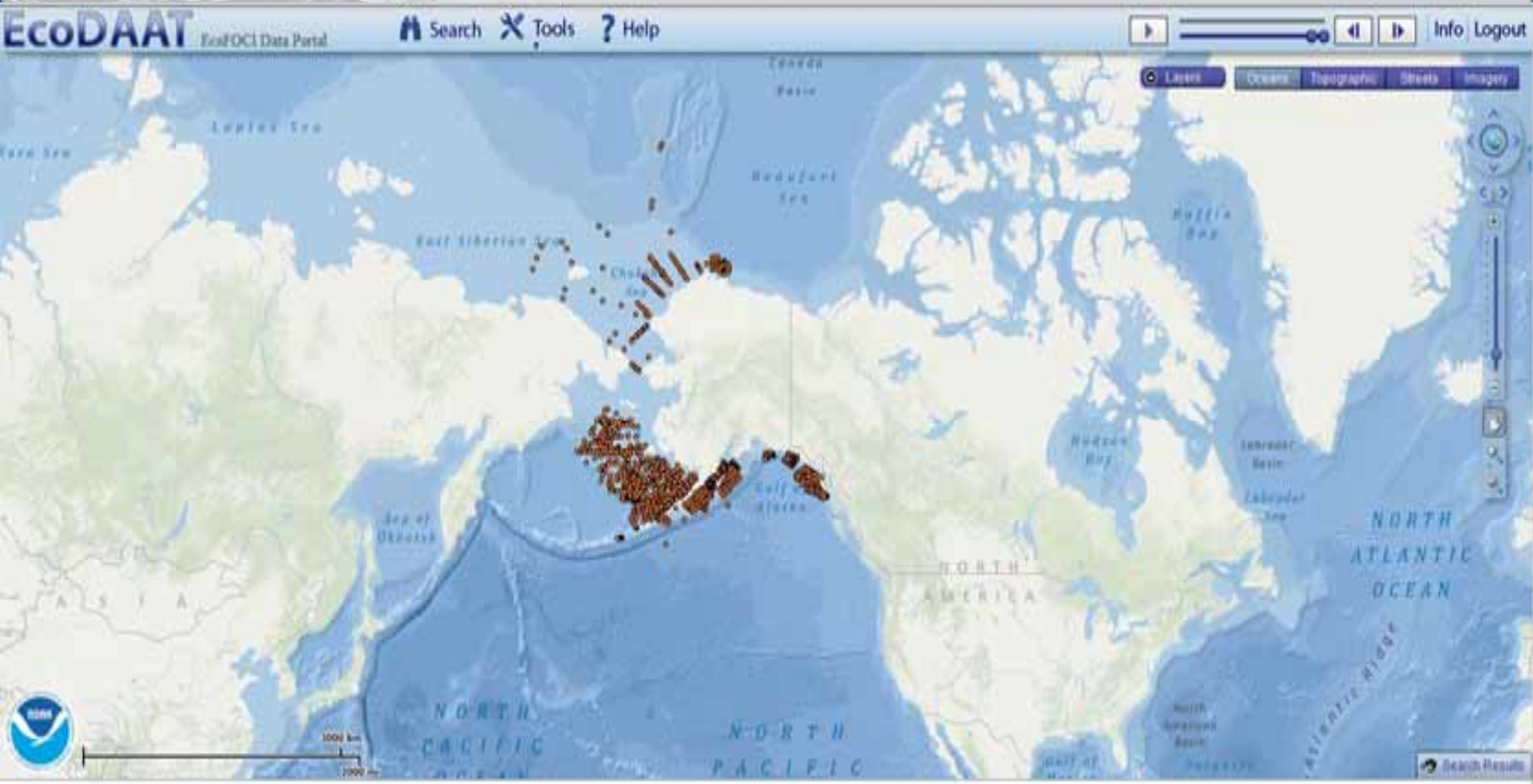
Project steps

- Design single Oracle
- Load data from existing databases
- Prototype front-end created in ArcServer
- Flex viewer, user authentication
- Link to ArcGIS for further analyses
- *Test deployment on an Amazon cloud hosted instance of ArcServer*

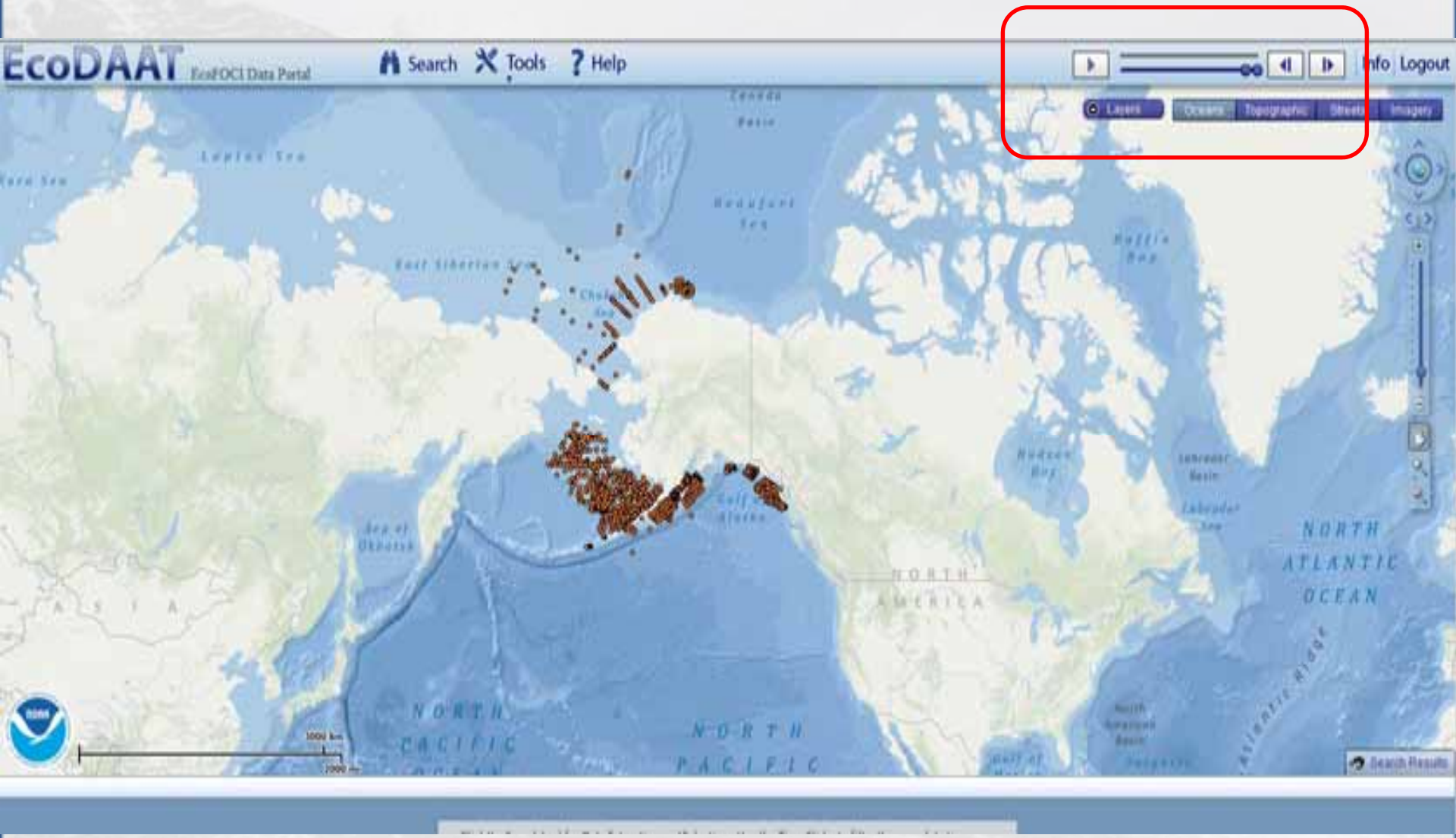


- LDAP authentication
- ArcServer security as an option

Main interface



Time slider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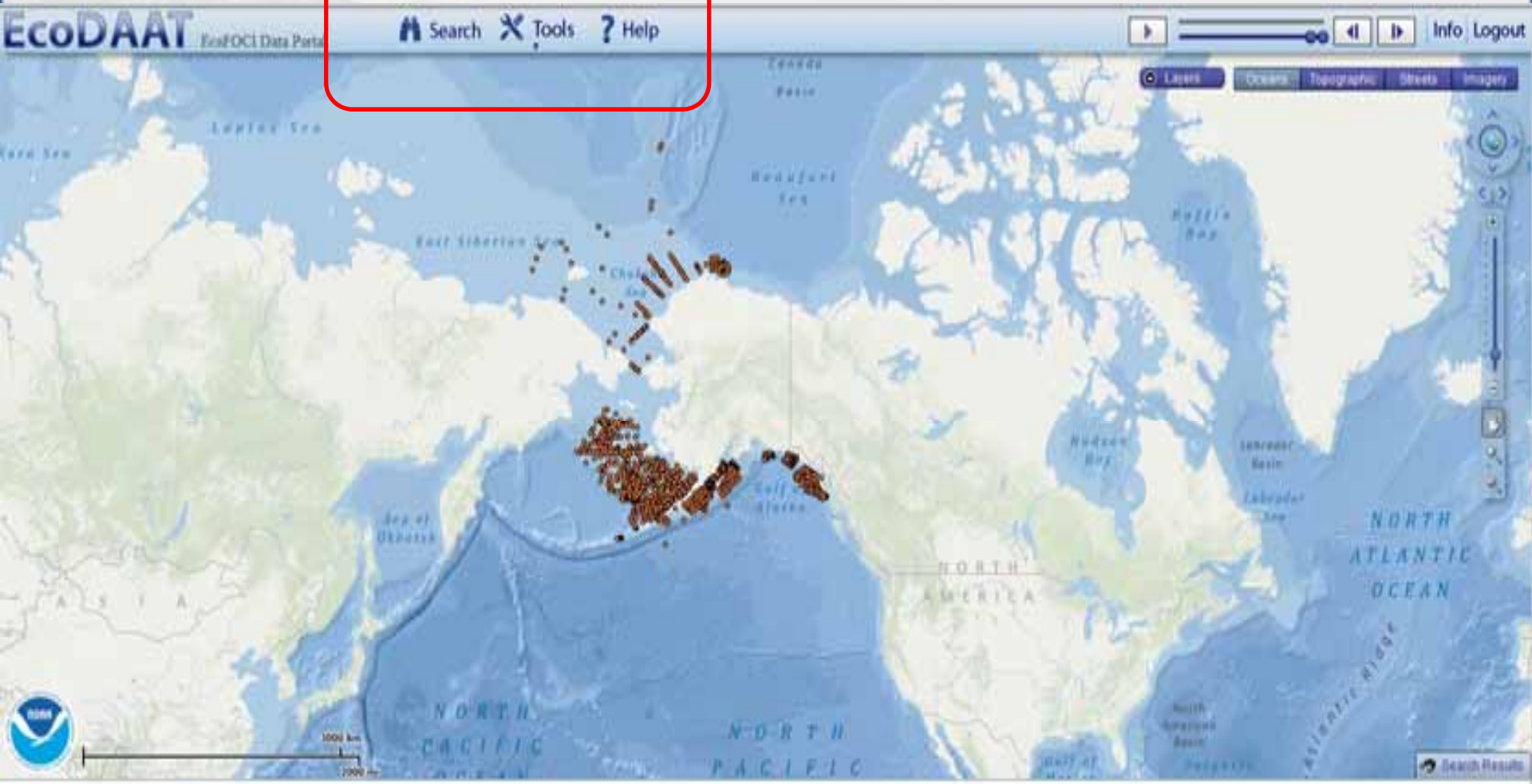
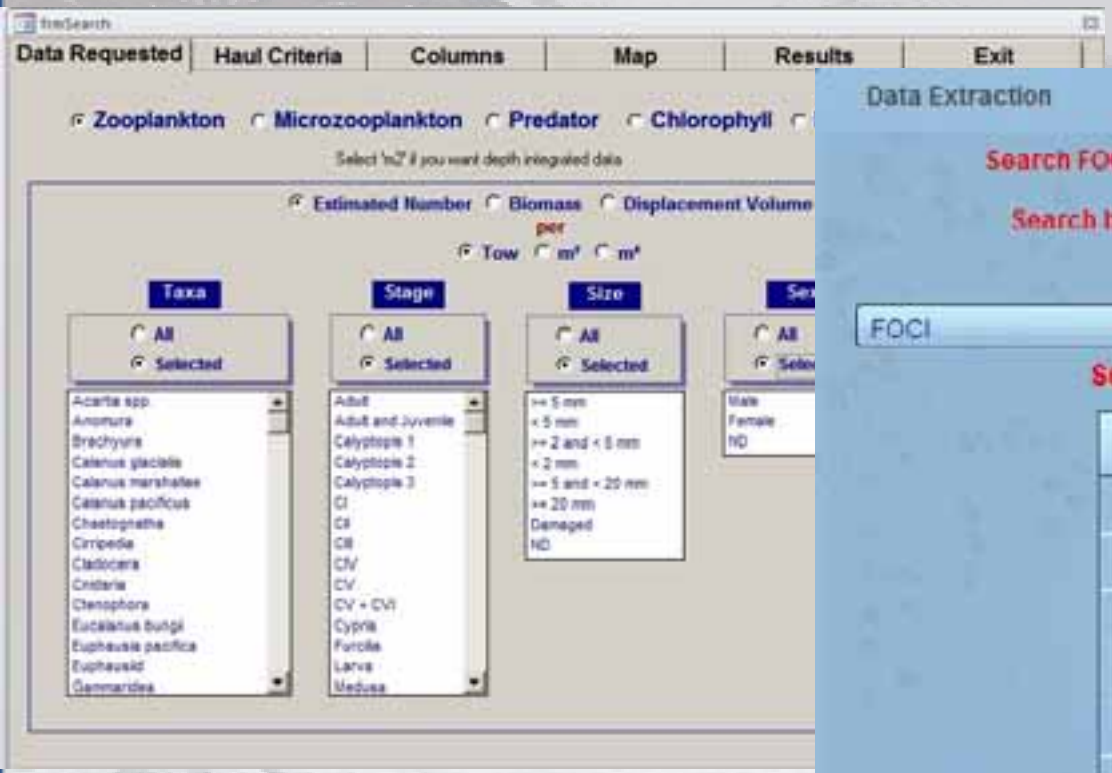
Topographic
Streets
Imagery
NORTH ATLANTIC OCEAN
NORTH PACIFIC
NORTH AMERICA
ASIA

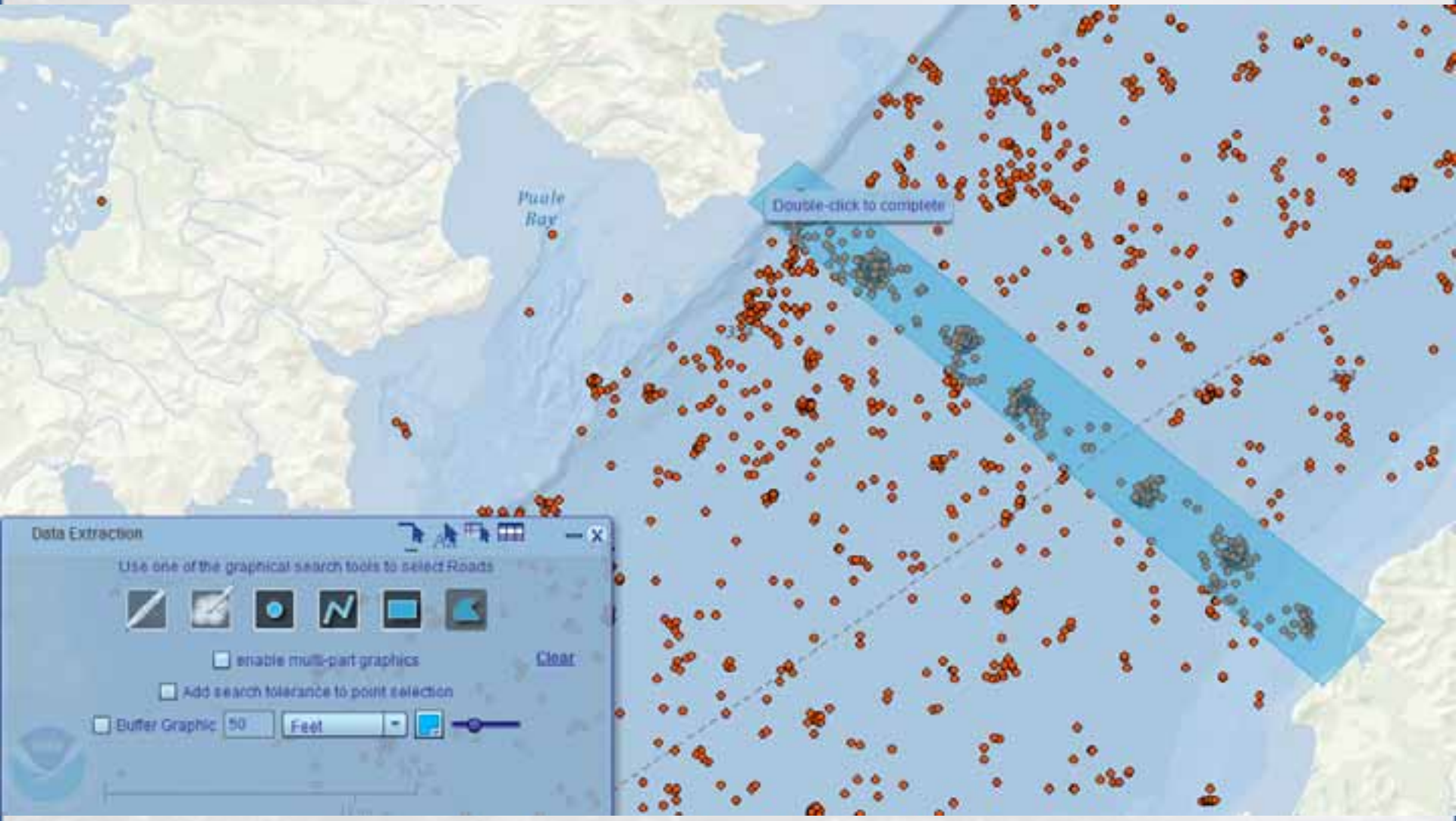
Data selection and tools

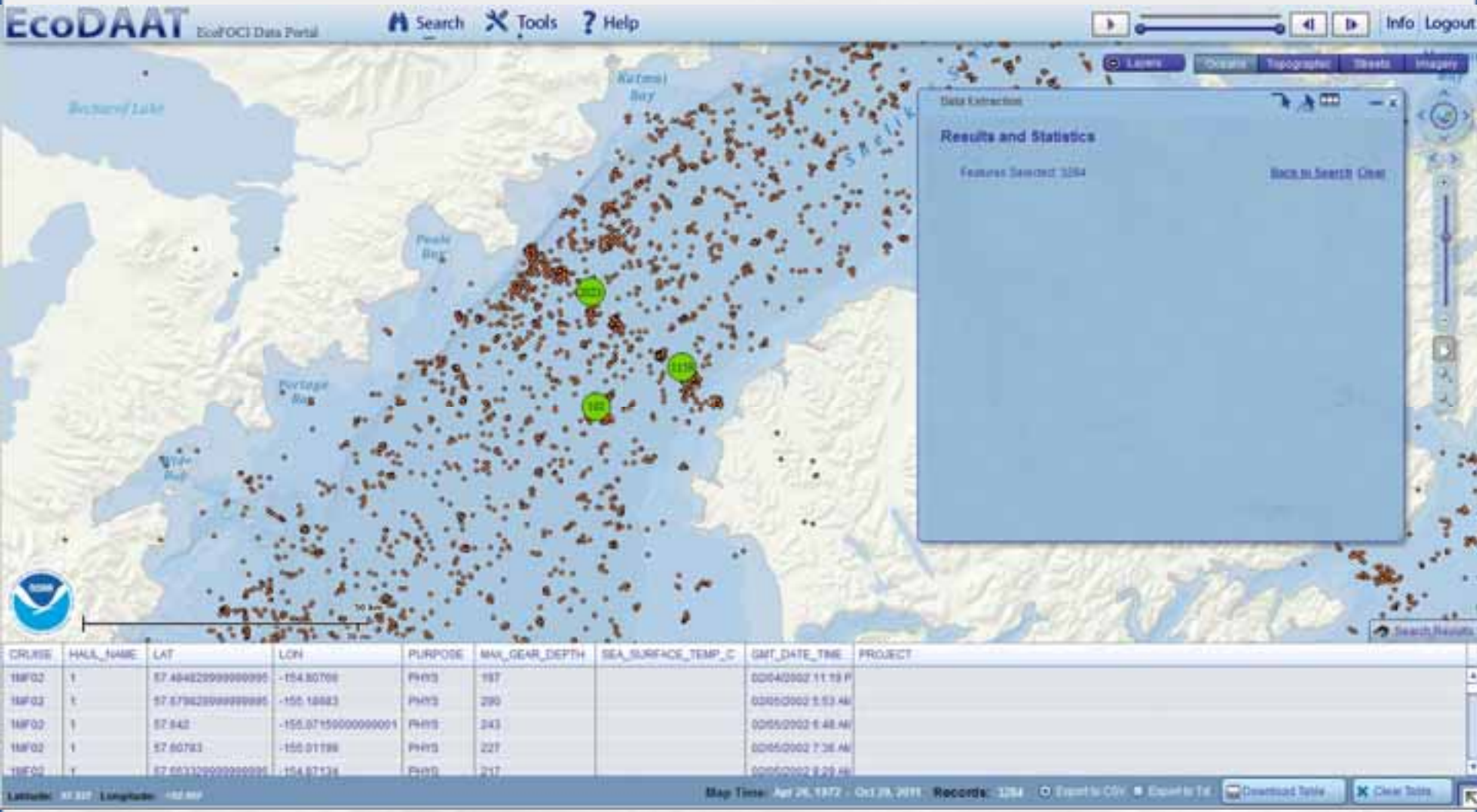


Forms based-data selection



Map based data selection

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Streets
Imagery
Data Extraction
Results and Statistics
Features Selected: 1284
Back to Search
Clear
Search Results
CRUISE
HAUL_NAME
LAT
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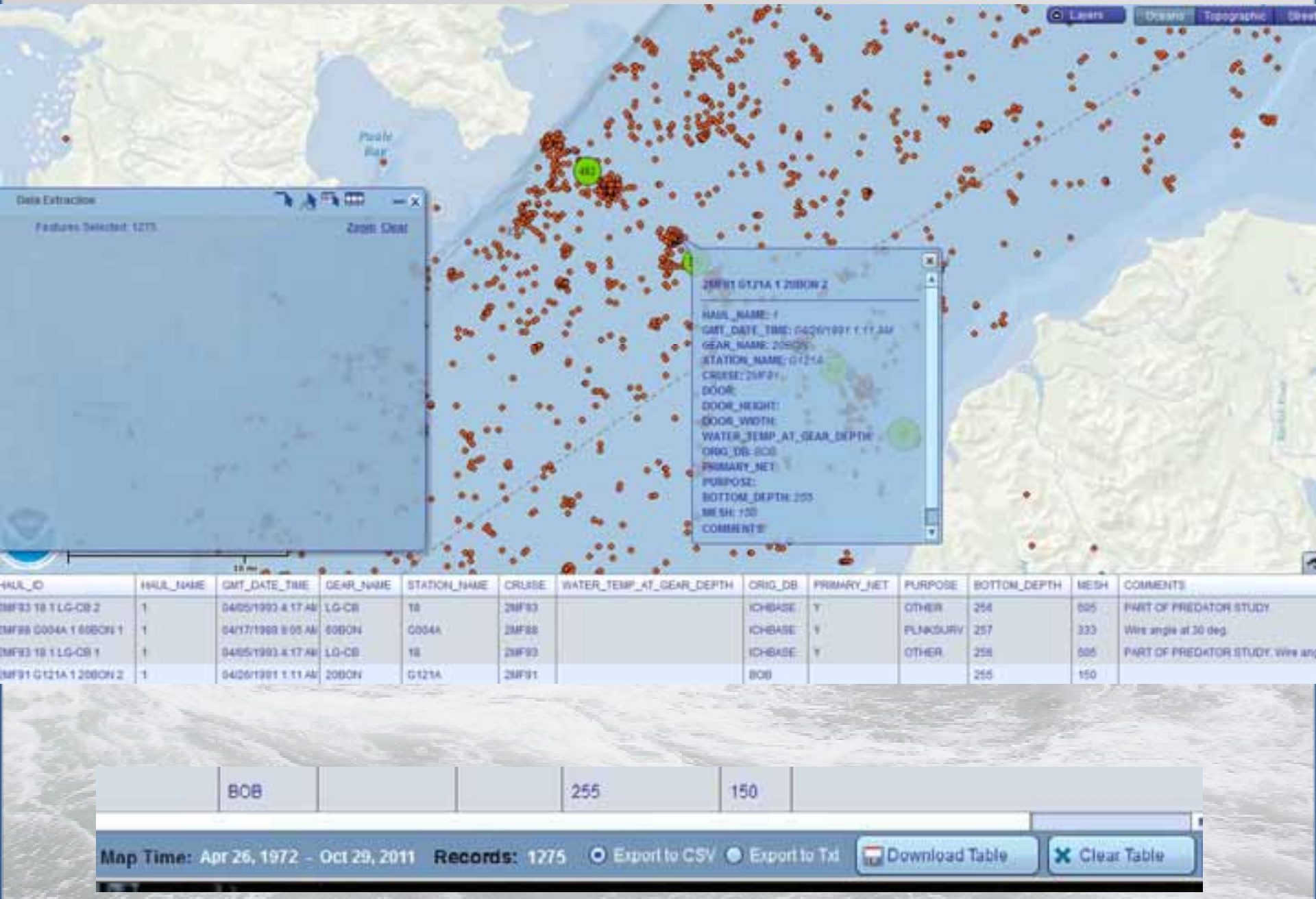
MAX_GEAR_DEPTH
SEA_SURFACE_TEMP_C
GMT_DATE_TIME
PROJECT
Map Time:
Records: 1284
Export to CSV
Export to Txt
Download Table
Clear Table



HAUL_ID	HAUL_NAME	GMT_DATE_TIME	GEAR_NAME	STATION_NAME	CRUISE	WATER_TEMP_AT_GEAR_DEPTH	ORIG_DB	PRIMARY_NET	PURPOSE	BOTTOM_DEPTH	MESH	COMMENTS
2MF93 18.1 LG-CB 2	1	04/05/1993 4:17 AM	LG-CB	18	2MF93		ICHBASE	Y	OTHER	256	505	PART OF PREDATOR STUDY
2MF88 G004A 1 60BON 1	1	04/17/1988 9:05 AM	60BON	G004A	2MF88		ICHBASE	Y	PLNKSURV	257	333	Wire angle at 30 deg
2MF93 18.1 LG-CB 1	1	04/05/1993 4:17 AM	LG-CB	18	2MF93		ICHBASE	Y	OTHER	256	505	PART OF PREDATOR STUDY. Wire ang
2MF91 G121A 1 20BON 2	1	04/26/1991 1:11 AM	20BON	G121A	2MF91		BOB			255	150	

	BOB			255	150	

Map Time: Apr 26, 1972 - Oct 29, 2011 **Records:** 1275 Export to CSV Export to Txt Download Table Clear Table

Implementation in the cloud

- Technically straightforward
- Authentication allows public presence of web front end
- Limiting denial of service attacks
- Security concerns about cloud deployment
- FISMA certification
- Updates and recertification

Questions?

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