



# Hydroclimatological Data Rescue, Data Inventory, Network Analysis & Data Dissemination

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Ongoing Partners: Arctic Landscape Conservation Cooperative, BLM,  
USFWS

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# Outline

- Motivation
- Objectives
- Phase 1
  - Create a database
  - Acquire and Inventory Metadata
  - Disseminate – interface for queries, visualizations, & downloading data
- Phase 2
  - Populate the database with data
  - Network Analysis

An aerial photograph of a wide, winding river in a vast, flat landscape. The river is a deep blue-green color, contrasting with the surrounding green and brownish-yellow terrain. The sky is overcast with grey clouds. The overall scene is a wide, open landscape, likely in the Arctic region.

# Project Motivation

- Convey institutional knowledge and field data to a new generations of stakeholders
- Integrate disparate datasets
- DOI Sec. Order (9/14/2009) -- address climate change & analyze impacts when making management decisions
- Establishment of the Arctic LCC
- Science and management needs defined in WildREACH Report & NSSI Emerging Issues Papers

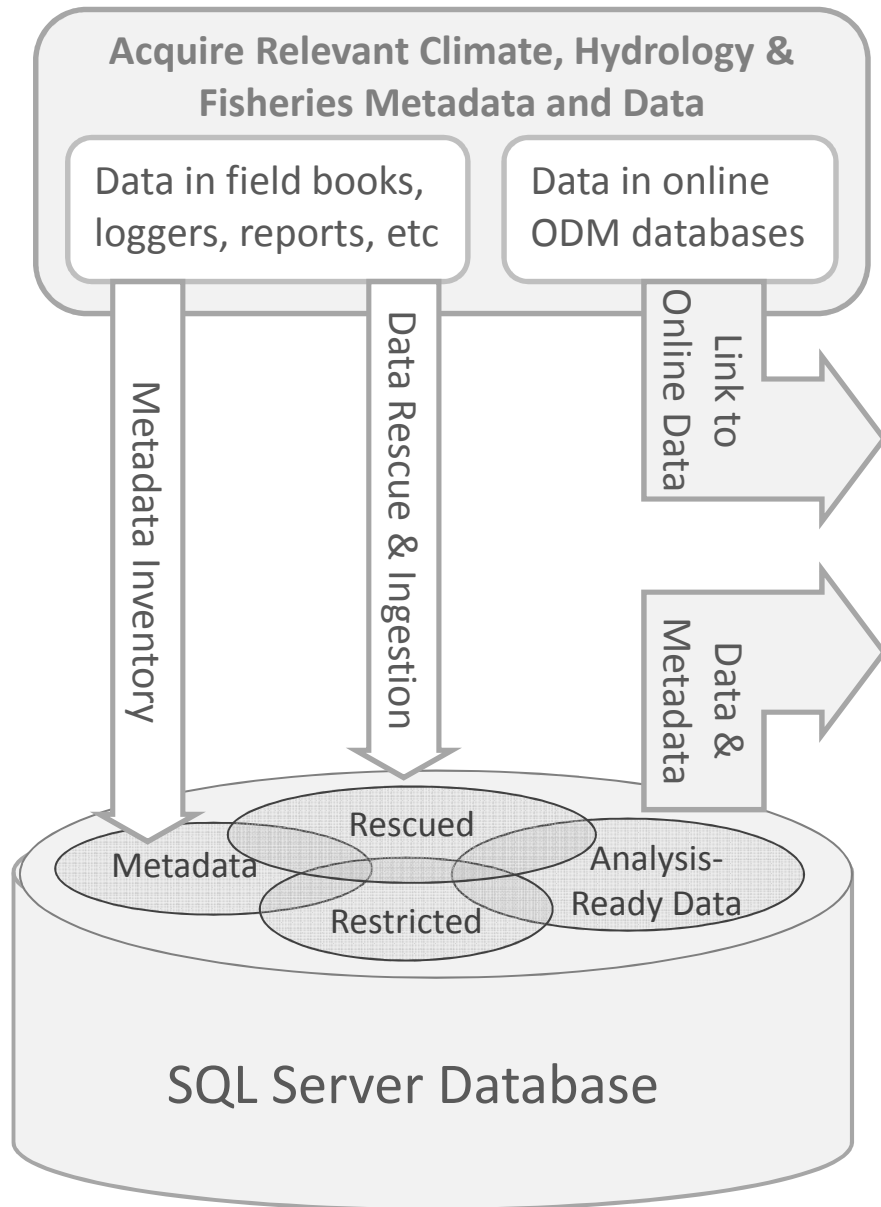
# Scientific Priorities: WildREACH/NSSI

- How much water is available at local & regional scales?
- Is the Arctic hydrologic cycle undergoing significant change?
- How will these changes affect:
  - water balance, phenology, snow pack, active layer depth, drainage patterns, connections between water bodies, flooding, rain on snow events, etc
- What kind of long-term hydrologic monitoring network is needed in the Arctic?

# NSSI Emerging Issues Papers Highlights

- Data collection is currently ad hoc.
- Status of hydrological processes are poorly understood.
- Potential changes are difficult to predict and with the current level of information will be difficult to document.
- Need to:
  - inventory existing stations
  - undertake a gap analysis
  - invest in an improved well-coordinated monitoring network with consistent methods for collecting, storing, managing, and disseminating data

# Objectives



## Website

### I. Geo-Inventory

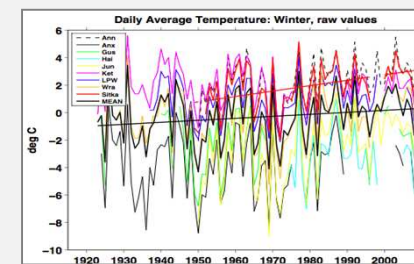
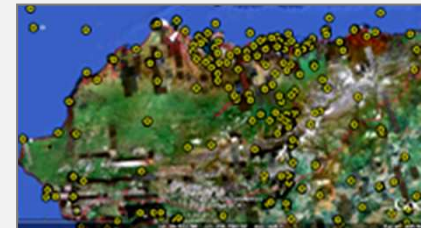


### II. Geo-Database

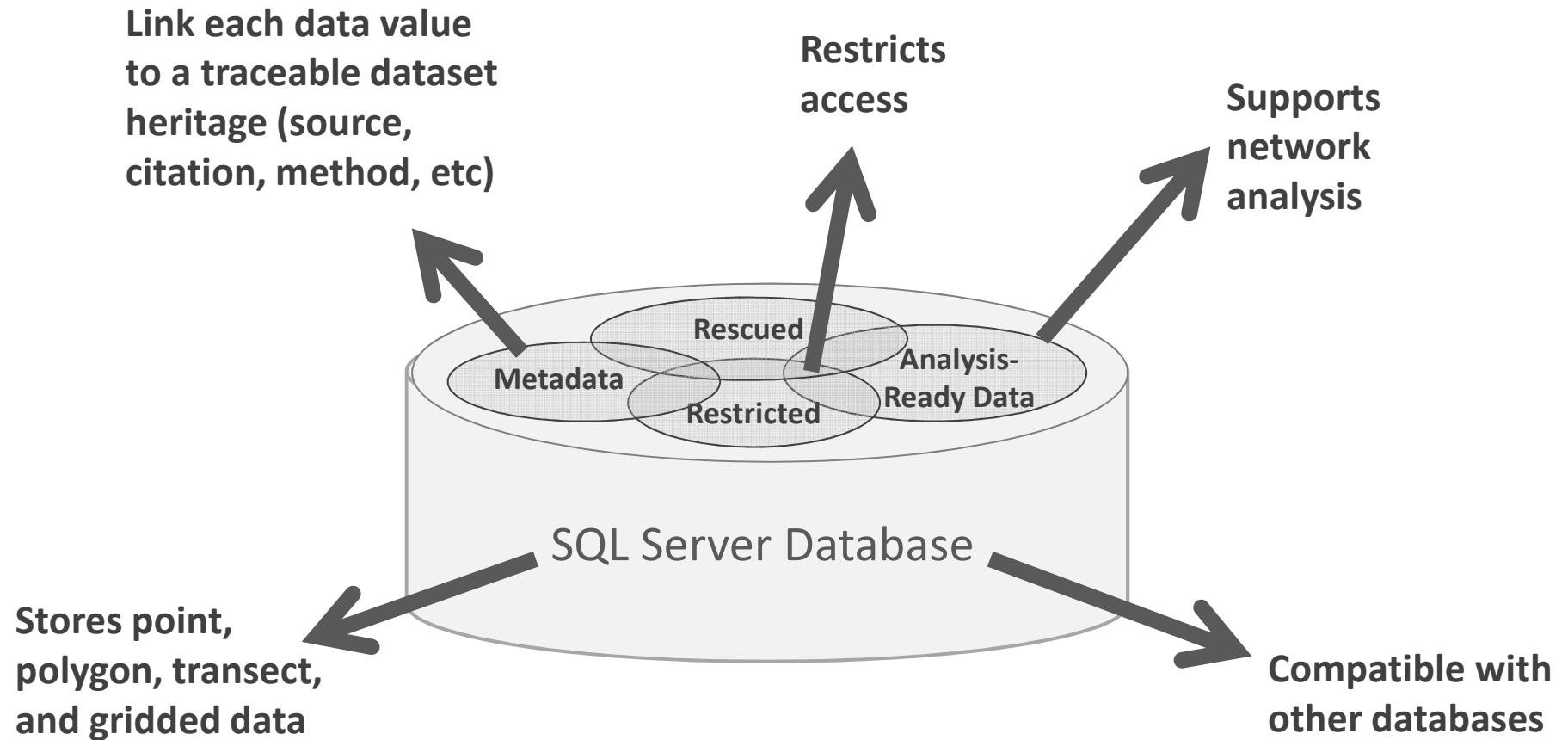
site	dates	Variable, medium	diation	source	Sample interval
Mine SiteB	xxx-xxx	Temperature, air	,xxxx,xxx	UAF, WERC	hourly
Mine SiteB	xxx-xxx	Water Level, surface water	,xxxx,xxx	UAF, WERC	hourly
Lake 9713	xxx-xxx	Fish Presence, surface water	,xxxx,xxx	AKDFG	sporadic

## Network Analysis and Report

- Data Density
- Length of Record
- Trend Analysis
- Correlation
- Cost-surface



# We need a container to hold the data

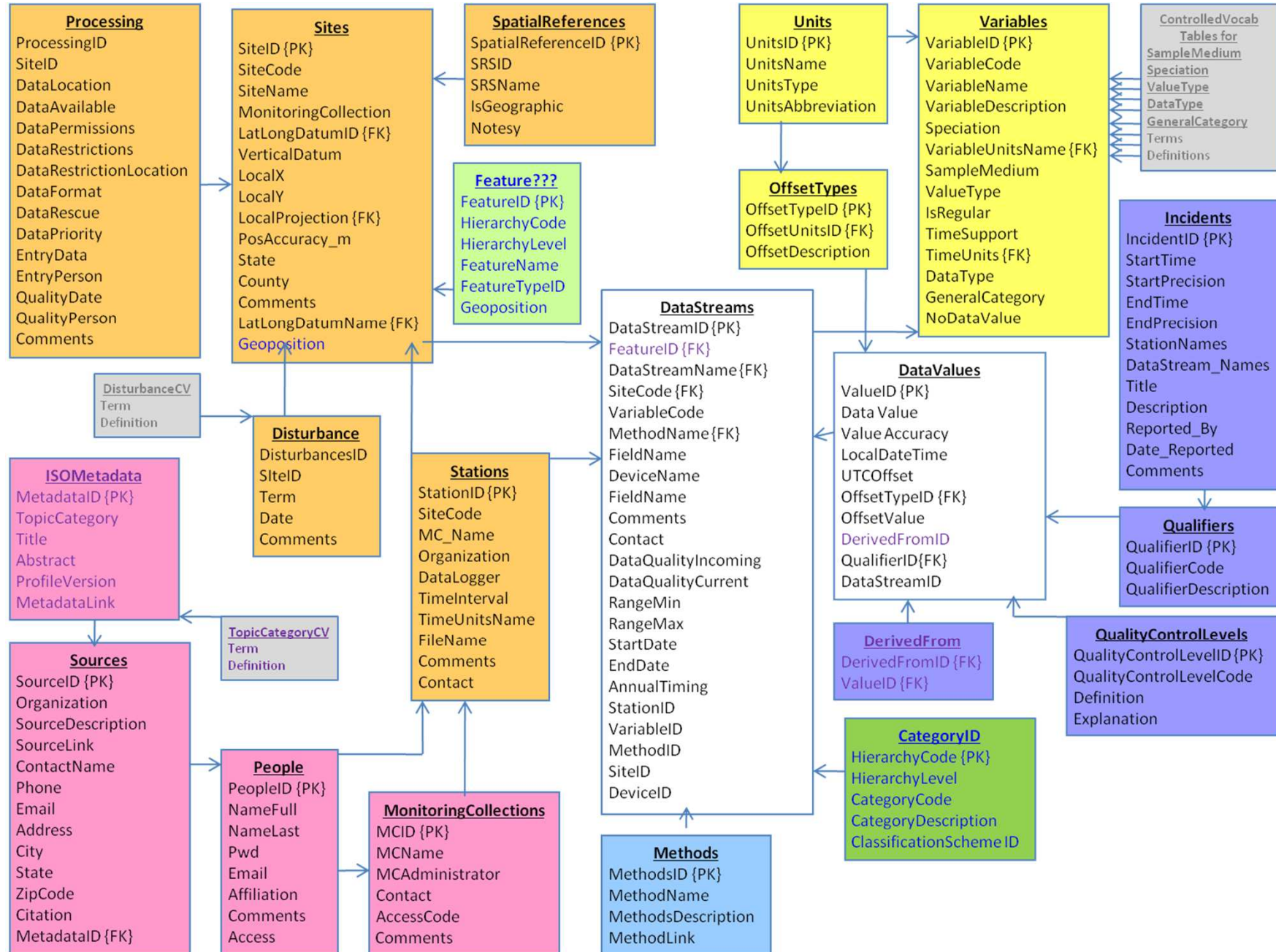


# The Container – Needs Versus Available Models

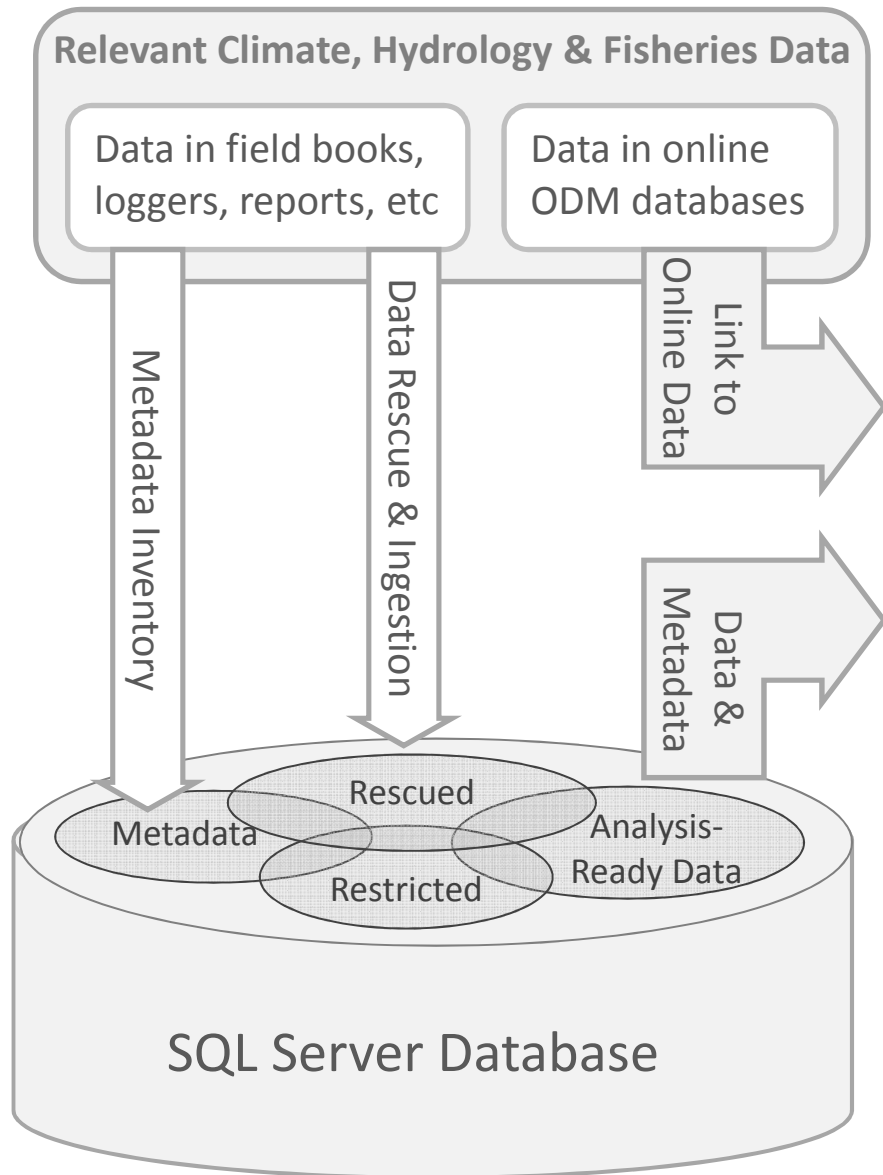
Needs	CUAHSI ODM	Berkeley Sensor	SciScope	Aquabase Hybrid
Support network analysis				X
Compatible with other ODM databases (WERC, NSDSS, etc)	X	X	X	X
Store point observations	X	X	X	X
Store polygon, gridded, and transect observations			X	X
Store hydrology, climate, and, potentially, biological data	P	P	X	X
Tables to prioritize processing of inventoried data				X
Link each observation to traceable dataset heritage, including appropriate citation and QA/QC information	X	X	X	X
Restrict access to select datasets		X	X	X



# Evolving Aquabase Hybrid



# We need an interface for queries, visualizations, and downloading data



## Website

### I. Metadata Inventory

### II. Geodatabase

site	dates	Variable, medium	citation	source	Sample interval
Mne SiteB	xxx-xxx	Temperature, air	xxxx,xxx ,xxxxxxx	UAF, WERC	hourly
Mne SiteB	xxx-xxx	Water Level, surface water	xxxx,xxx ,xxxxxxx	UAF, WERC	hourly
Lake 9713	xxx-xxx	Fish Presence, surface water	xxxx,xxx ,xxxxxxx	AKDFG	sporadic

- **Geolocated metadata inventory with pop-ups and links to data sources and datasets**
- **Users will be able to search and download data in their favorite format**

# Queries and Data Visualization

Trying to go with off-the-shelf freeware -- SQL Server Management Studio:

The screenshot displays the Microsoft SQL Server Management Studio interface. The main window shows a query titled "BoundingBoxQuery...COD (iarclcc (52))" with the following SQL code:

```
DECLARE @box geography
SET @box = geography::STGeomFromText('POLYGON((-143.0 70.0,-143.0 69.0,143.0 69.0,143.0 70.0,-143.0 70.0))', 4326)
SELECT SiteGeography.SiteCode,
EXT_FWS_FishSample.FishName,
EXT_FWS_FishSample.Fry,
EXT_FWS_FishSample.Juvenile,
EXT_FWS_FishSample.Anadromous,
EXT_FWS_FishSample.Resident,
EXT_FWS_FishSample.Occasional,
EXT_FWS_FishSample.Rearing,
EXT_FWS_FishSample.Feeding,
EXT_FWS_FishSample.Spawning,
EXT_FWS_FishSample.Overwinter,
SiteGeography.GeographyLocation
```

The Object Explorer on the left shows a database named "dbo" with several tables and views, including "EXT\_FWS\_FishSample". The Properties window on the right shows connection details for "icewater.ine.uaf.edu".

The Results window at the bottom displays a spatial visualization of the data. The map shows a bounding box (a rectangle) and a set of points (marked with 'Y') representing the data points. The map is overlaid on a grid of latitude and longitude coordinates. The bounding box is defined by the coordinates (-143.0, 70.0) and (143.0, 69.0). The map shows a complex shape representing the data points, with a zoom level of 142. The map is titled "BoundingBoxQuery...COD (iarclcc (52))".

The status bar at the bottom indicates that the query was executed successfully, returning 23 rows in 00:00:08. The status bar also shows the connection name "icewater.ine.uaf.edu (10.50...)", the server name "iarclcc (52)", and the database name "IARCOD".

# Project Web Site



**Date Range:**  
From  to

**Networks:**

- Select All
- Alaska Department of Fish and Game (AKDFG)
- Arctic Observing Network
- Bureau of Land Management

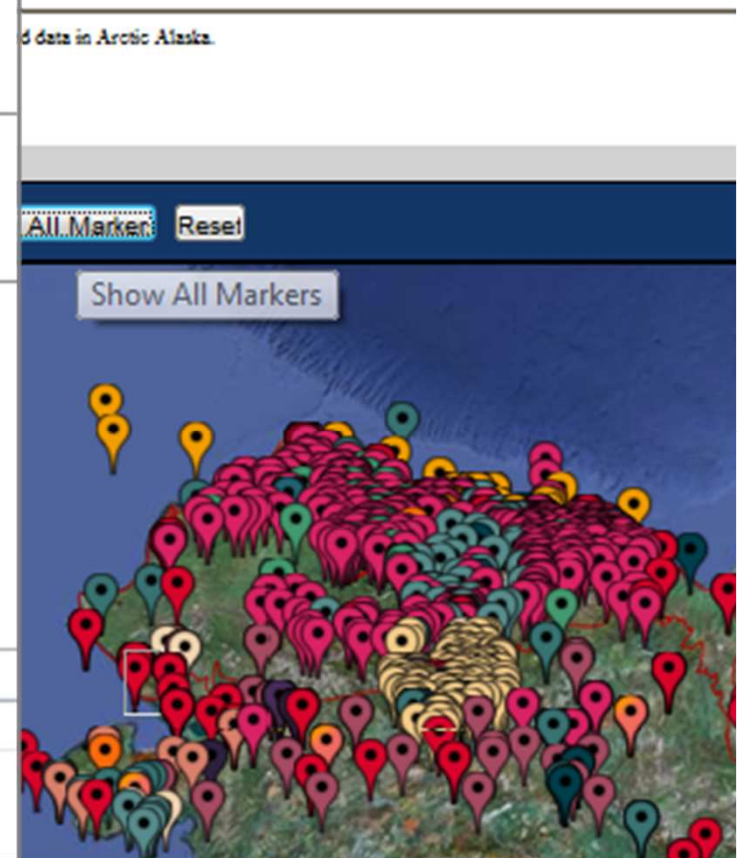
**Variables**

- Select All
- Amphere
- Area, surface
- Battery voltage

**Bounding Box**  
Enter in a lower left bounding point and an upper right bounding point:

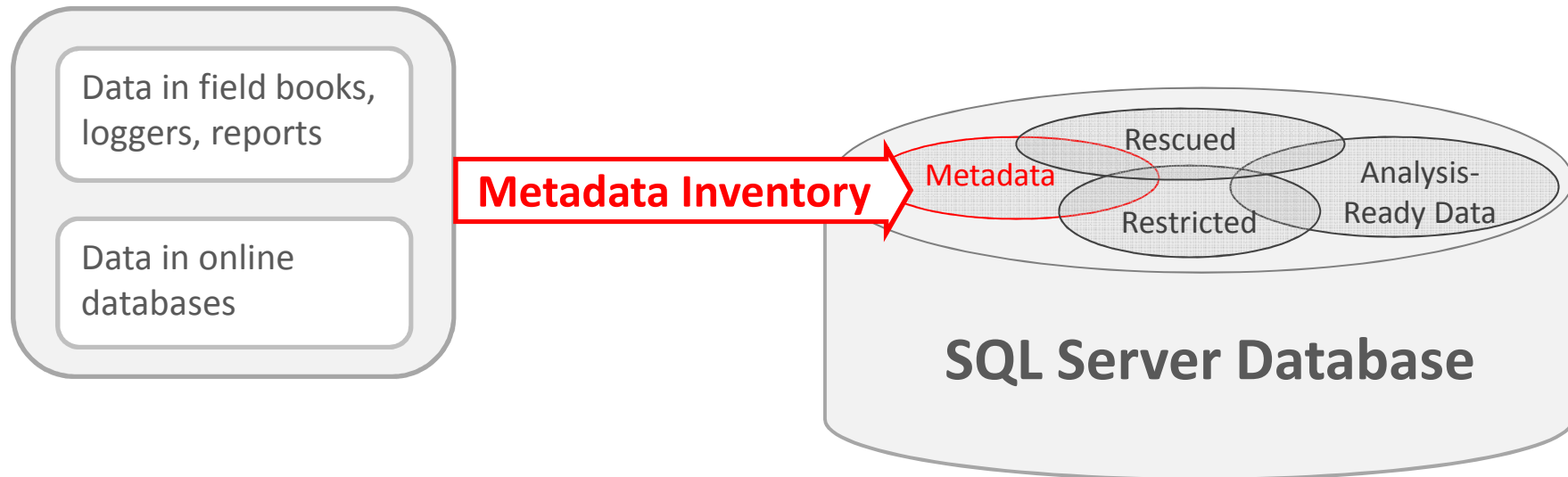
Lower Left Longitude  Upper Right Longitude

Lower Left Latitude  Upper Right Latitude



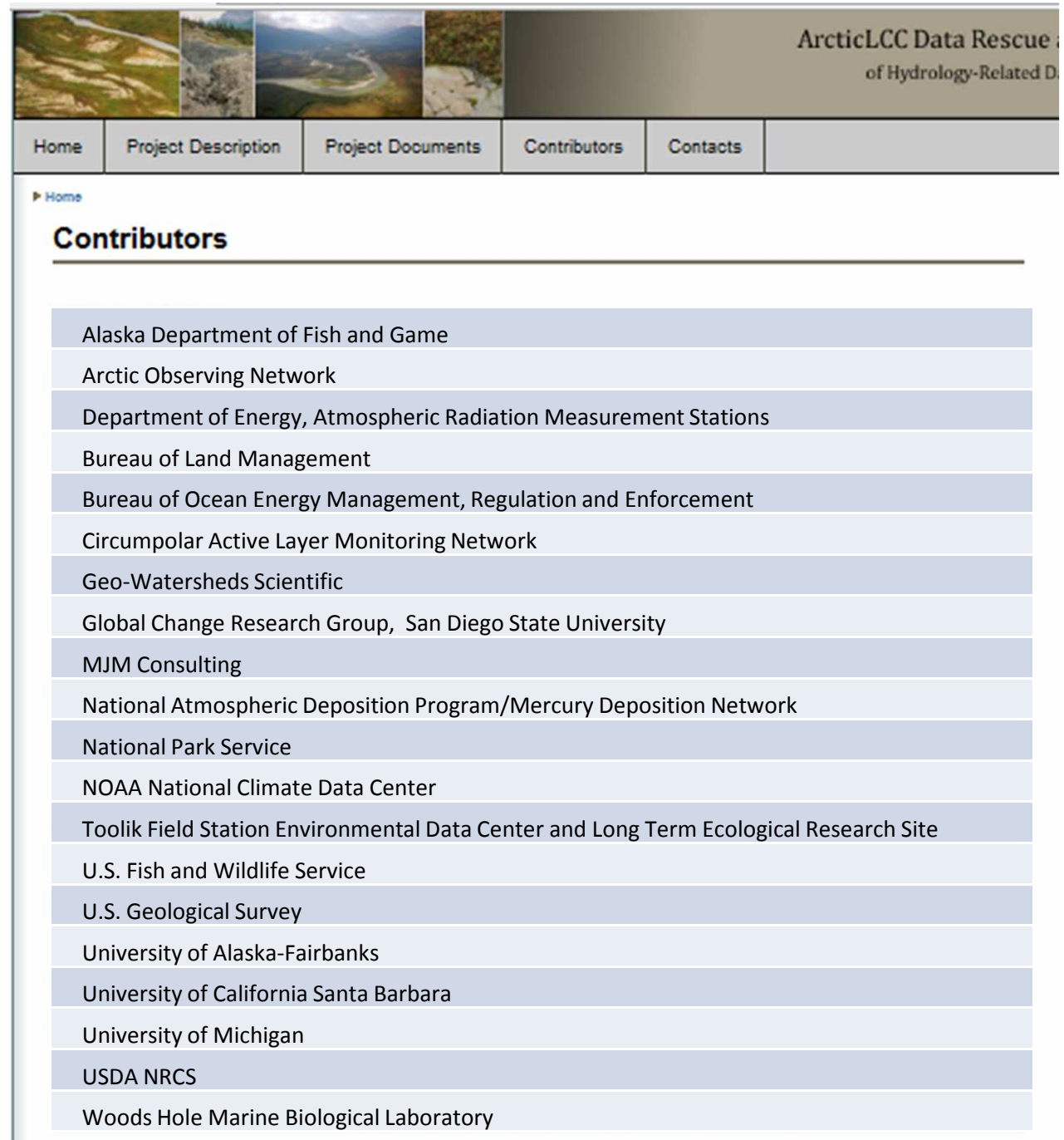
# Metadata Inventory

- Identified data sources
- Acquired metadata
- Interpreted, reformatted, standardized, and entered metadata



# Metadata

- Requests ongoing
- Entered to date:
  - Site (5000)
  - Organizations (20)
  - Source (75)
  - Variables (74)
  - Data Streams (634)



The screenshot shows the ArcticLCC Data Rescue website. The header includes the title "ArcticLCC Data Rescue" and "of Hydrology-Related D". Below the header is a navigation menu with links for Home, Project Description, Project Documents, Contributors, and Contacts. The main content area is titled "Contributors" and lists 20 organizations:

- Alaska Department of Fish and Game
- Arctic Observing Network
- Department of Energy, Atmospheric Radiation Measurement Stations
- Bureau of Land Management
- Bureau of Ocean Energy Management, Regulation and Enforcement
- Circumpolar Active Layer Monitoring Network
- Geo-Watersheds Scientific
- Global Change Research Group, San Diego State University
- MJM Consulting
- National Atmospheric Deposition Program/Mercury Deposition Network
- National Park Service
- NOAA National Climate Data Center
- Toolik Field Station Environmental Data Center and Long Term Ecological Research Site
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- University of Alaska-Fairbanks
- University of California Santa Barbara
- University of Michigan
- USDA NRCS
- Woods Hole Marine Biological Laboratory

# Station Location Issues

<b>Stn Name:</b> KOGRU RIVER POW B	<b>IDS:</b> - NCDC STATION ID NUMBER: 20022479	(Logged in as guest)
<b>Country:</b> UNITED STATES	- WBAN NUMBER: 27511	
<b>State/Prov:</b> ALASKA		
<b>County:</b> UNKNOWN		
<b>Latitude:</b> 71.58333 (71°34'59.988"N)		
<b>Longitude:</b> -152.16667 (152°10'00.012"W)		
<b>Elevation:</b> 30.00 FEET (UNKNOWN)		
<b>POR:</b> 1958-01-01 => 1963-09-30		
<b>Climate Div:</b>		

Tab Remarks: [View \(0\)](#)

Kogru River  
Station -- 75  
miles off the  
coast??????

Distance:  MILES

KOGRU RIVER POW B, AK   
71.58333,-152.16667  
1958-01-01 to 1963-09-30

Beaufort Sea

A map interface showing a location pin on the Beaufort Sea. The pin is labeled with the station name and coordinates. The map includes navigation controls on the left and map style options at the top.

# Station Location Issues

Stn Name:	KOGRU RIVER POW B	IDS:	- NCDC STATION ID NUMBER: 20022479	(Logged in as guest)
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Climate Div:				

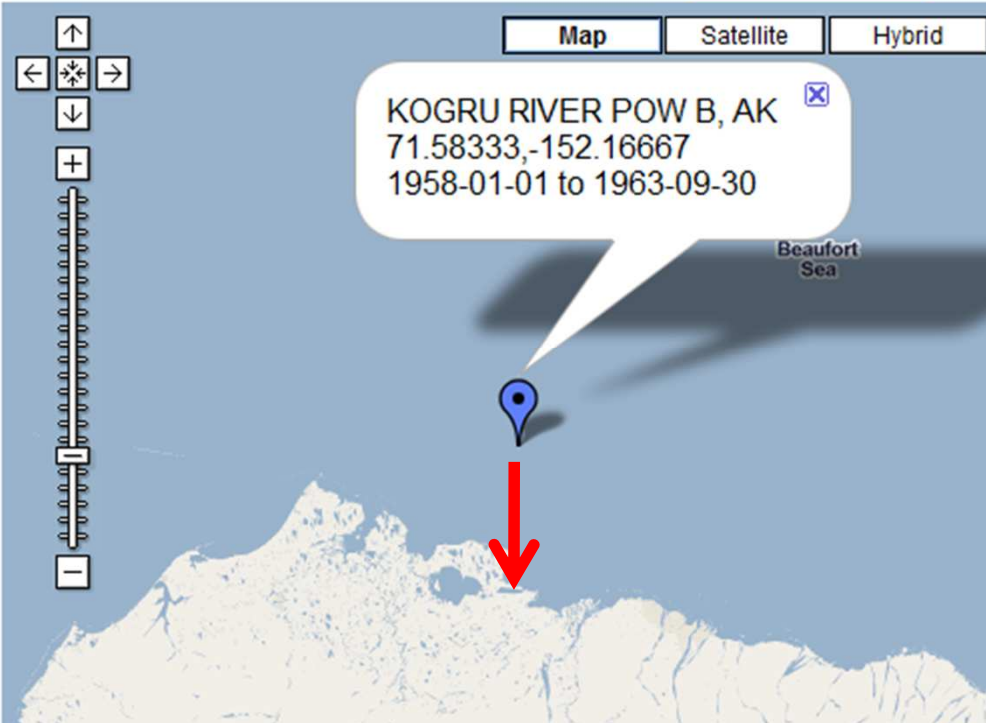
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KOGRU RIVER POW B, AK   
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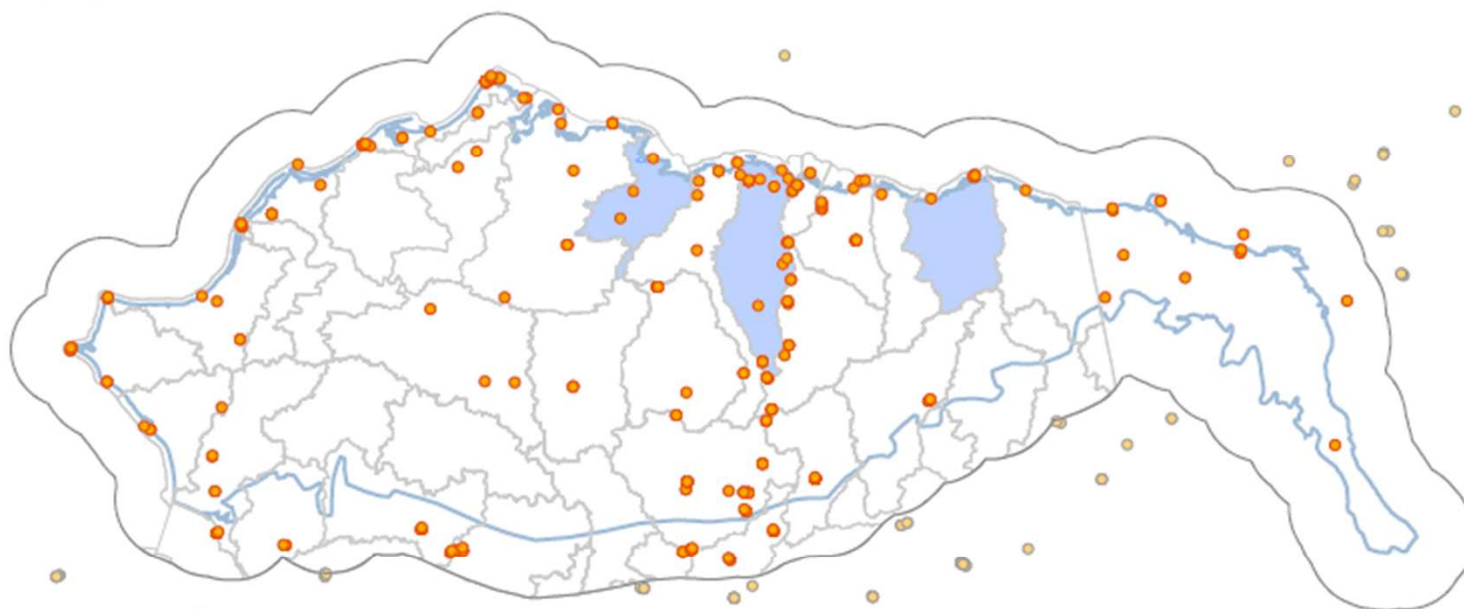
Beaufort Sea





# NCDC Weather Stations

- Stations
- 60 km buffer
- ArcticLCC\_Boundary

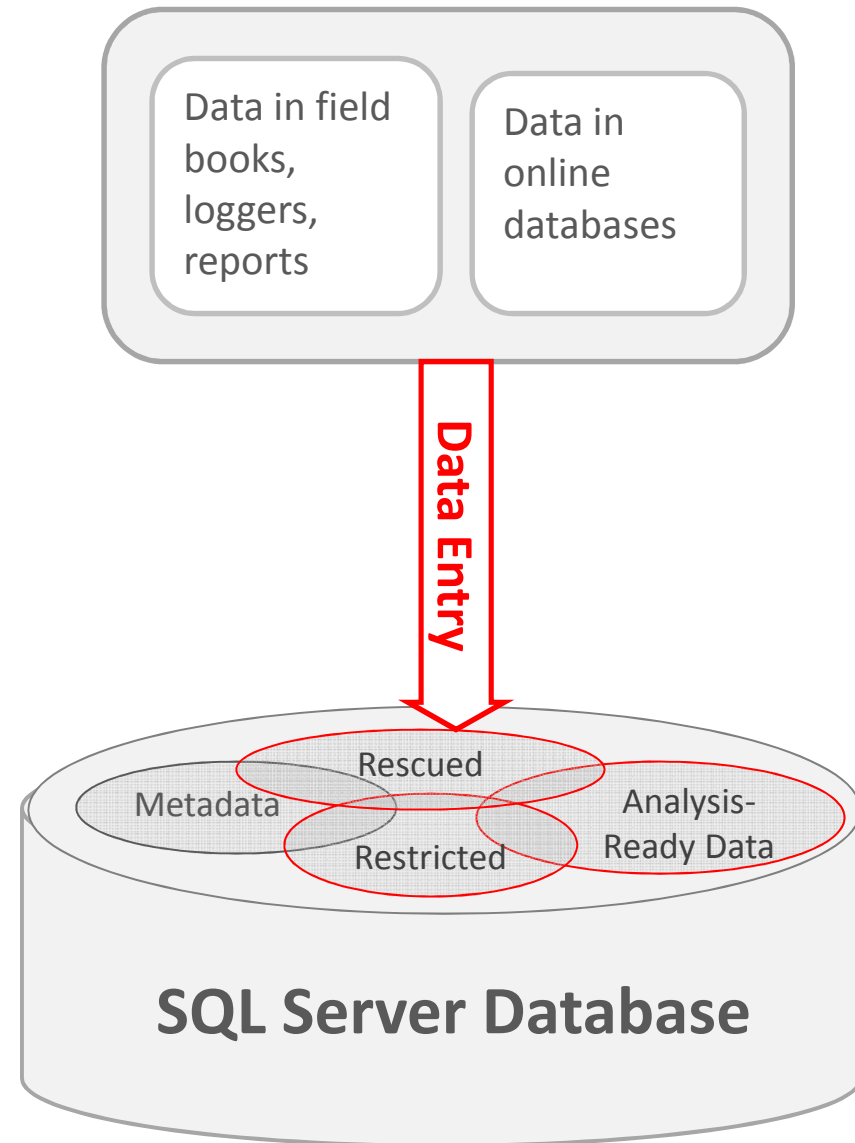


## Phase 2

- Populating the database
- Network analysis

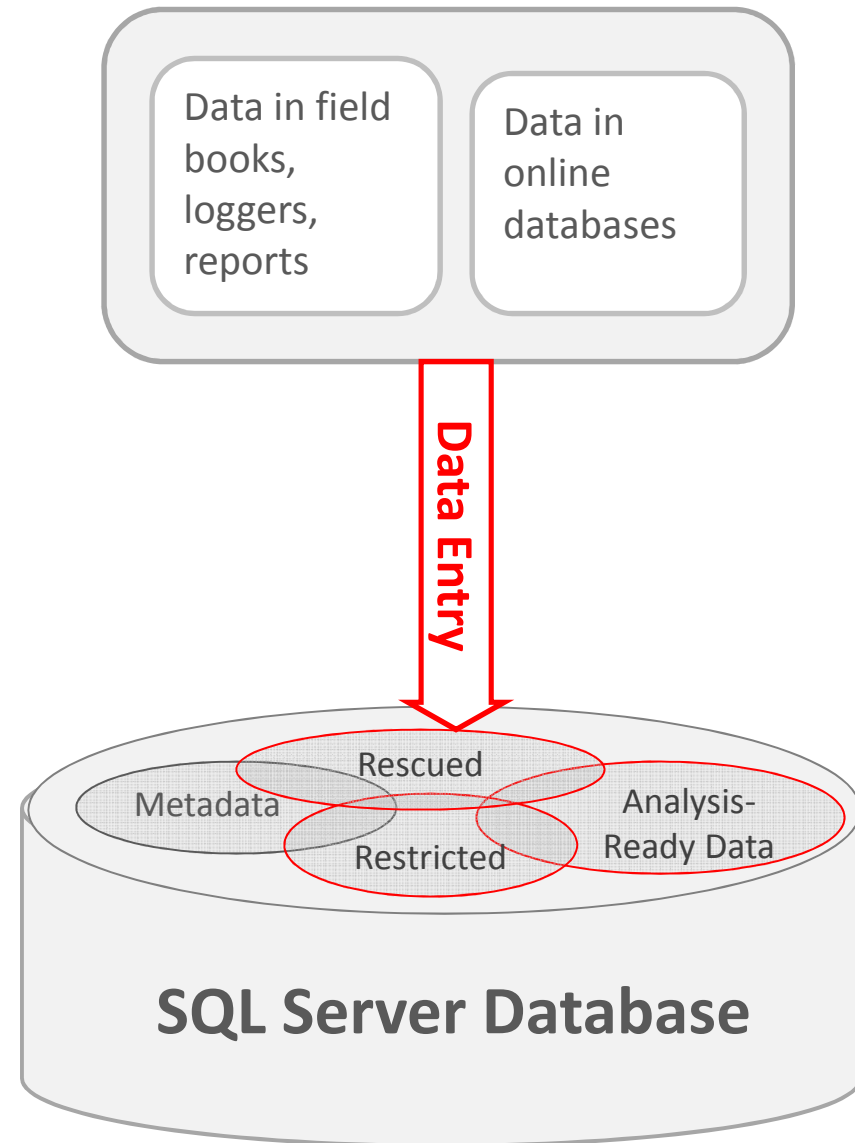
# Populating the database

- Acquire and archive data
- Rescue as needed
- Reformat, standardize, and enter data

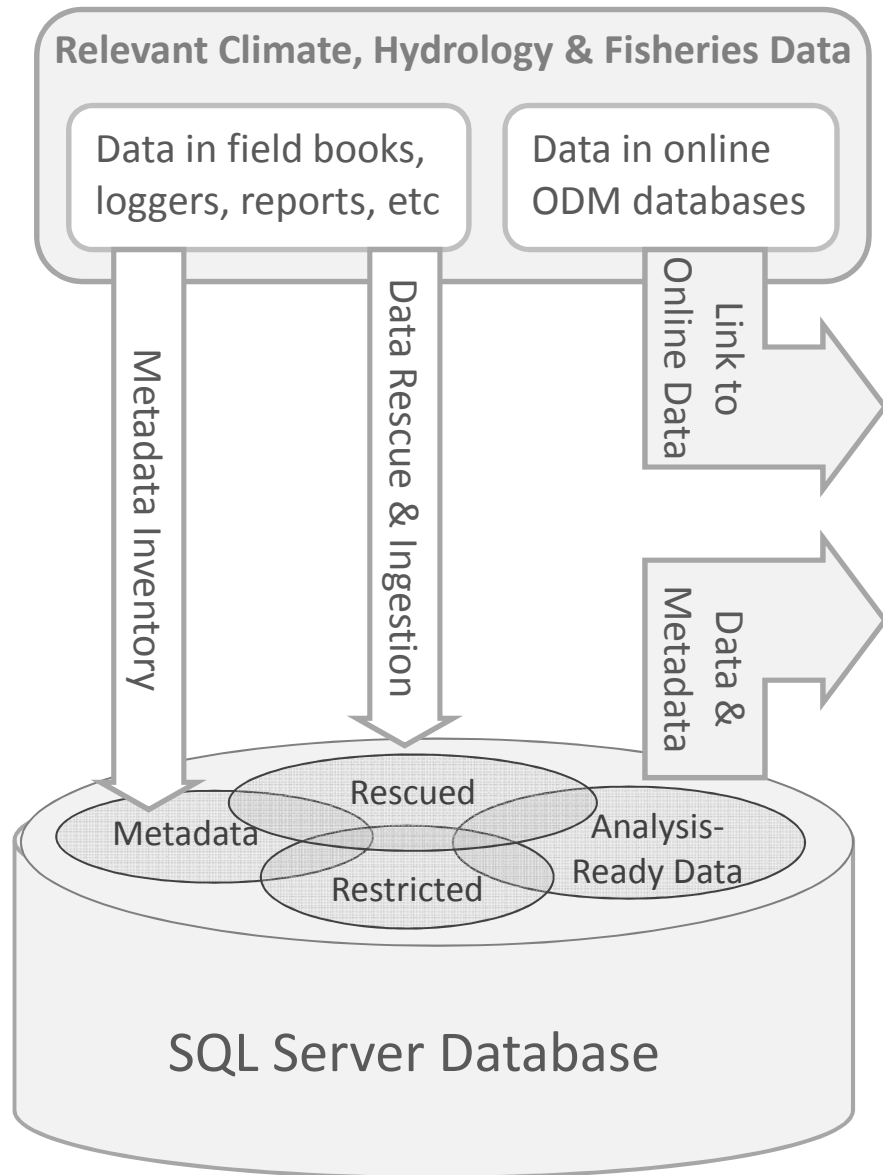


# Populating the database

- Acquire and archive data
- Rescue as needed
- Reformat, standardize, and enter data
- To date:
  - 216,000 data values for multiple variables at 150 sites
  - Millions of raw data values (1 site)



# Network Analysis



## Website

### I. Geo-Inventory

### II. Geo-Database

site	dates	Variable, medium	citation	source	Sample interval
Mne SiteB	xxx-xxx	Temperature, air	xxxx,xxx ,xxxxxx	UAF, WERC	hourly
Mne SiteB	xxx-xxx	Water Level, surface water	xxxx,xxx ,xxxxxx	UAF, WERC	hourly
Lake 9713	xxx-xxx	Fish Presence, surface water	xxxx,xxx ,xxxxxx	AKDFG	sporadic

## Network Analysis and Report

- Data Density
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- Trend Analysis
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- Cost-surface

# Network Analysis

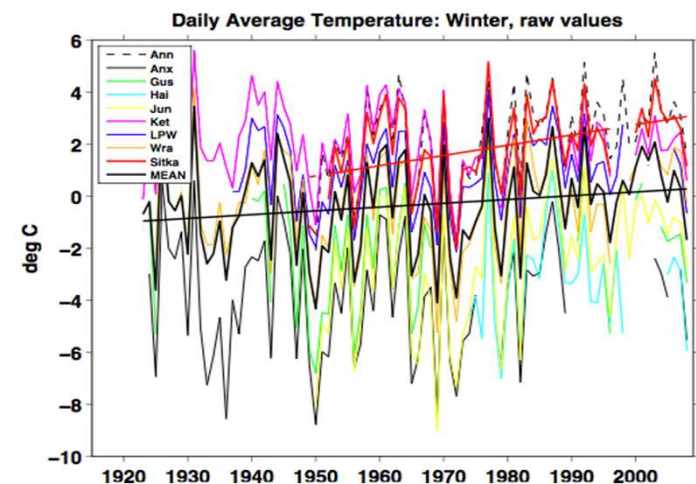
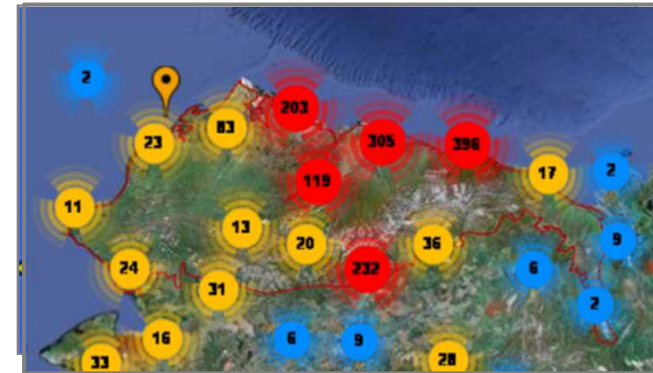
Address WildREACH/NSSI priorities

- Temporal and spatial trends
- Power to detect change
- Assess reliability of projections

Recommendations for monitoring networks will be based on

- Historic data density and period of record
- Major gaps
- Assess potential station modifications to increase data consistency
- Practicality -- cost surface analysis

Wrap up in February 2012



# Acknowledgements

An aerial photograph of a wide, winding river meandering through a valley. The river is light-colored, possibly due to sediment, and is surrounded by dark green forested areas. The background shows rolling hills and mountains under a hazy sky.

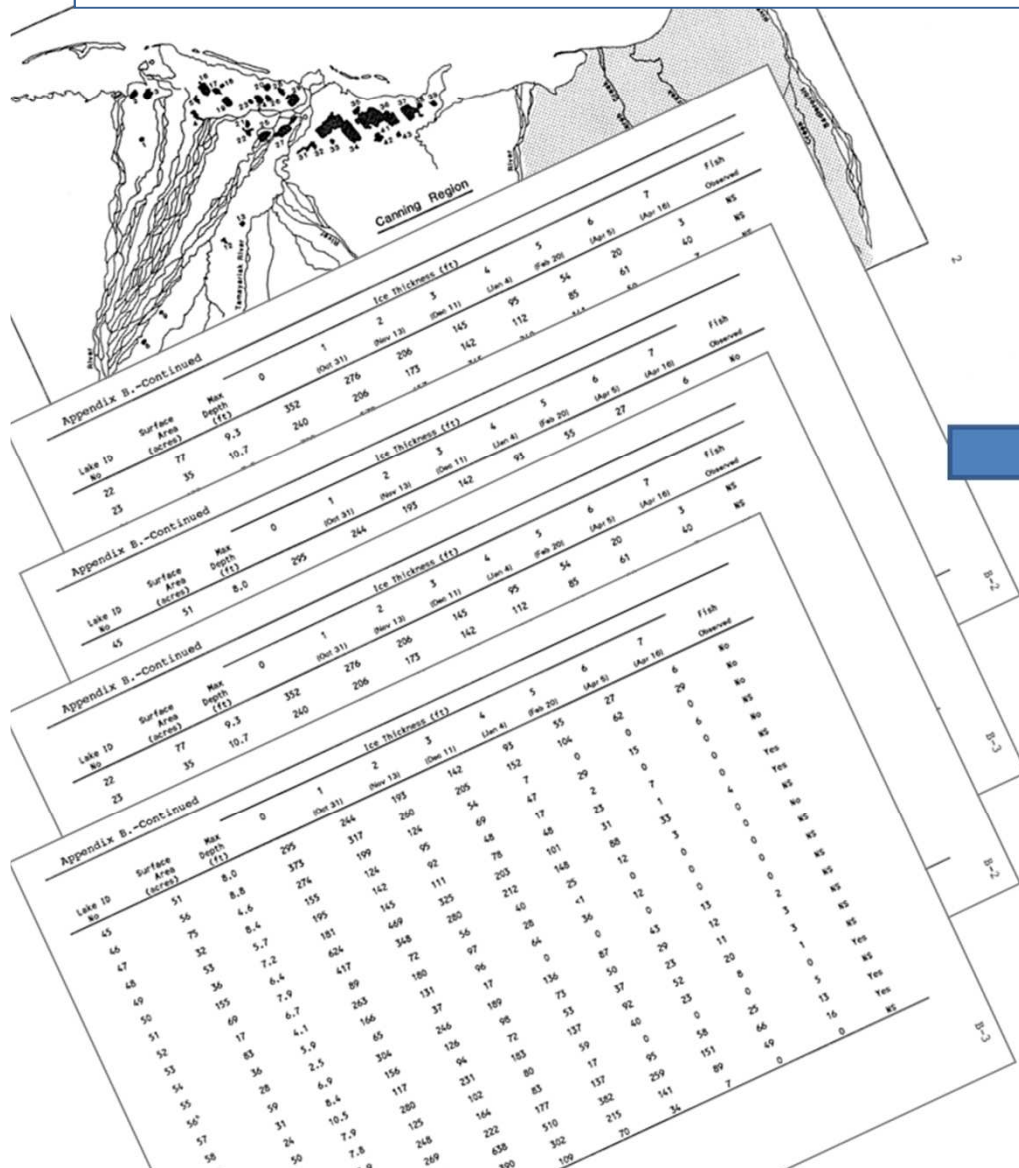
Amy Tidwell, Anja Kade, Anna Liljedahl, Ben Jones, Bill Schnabel, Bob Busey, Bruce Peterson, Chris Arp, Craig Stephenson, Dave Daum, Emily Youcha, Frank Urban, Gary Clow, Gaius Shaver, George Kling, Greta Myerchin, James Long, Jason Stuckey, Jennifer Jenkins, Joe Buckwalter, John Trawicki, Katrina Bennett, Kathleen Wedemeyer, Ken Hill, Lawrence Moulton, Matt Barkdull, Michael Lilly, Pam Sousanes, Peter Prokein, Philip Martin, Richard Kemnitz, River Gates, Rob Gieck, Scott Miller, Sveta Stuefer, Steve Frenzel, Sydonia Bret-Harte, Steve Kendall, Trevor Haynes, Walter Oechel, Matthew Whitman, Arctic LCC, NOAA, USDA-NRCS, WRCC, & many others.

[gburkart@alaska.edu](mailto:gburkart@alaska.edu)

	<u>Science/Management Question</u>	<u>General Database Query</u>
<b>Network analysis, general management, and data for models</b>	What variables were sampled on Lake 9817 or within bounding box (example: 70N 68N 150W 155W)?	All variables for all time for all space within a specified geographic extent (basin, reach, river, site)
	What snow water equivalent data are available on BLM land in the Arctic LCC?	All data for one variable for all time for a certain area
	Where has ice thickness been measured?	Sites (space), identified by variable.
	What variables under the general category of climate were measured at which sites within the bounding box, a particular land management unit, or entire Arctic LCC?	All variables under the General Category of Climate for all time for all space within a specified geographic extent (basin, reach, river, site)
	What reports or articles are available for Lake 9312?	All documents by specified geographic extent (basin, etc)
<b>Management questions</b>	What winter precipitation data are available for areas that had unusually low musk ox survivorship during 199X, 200X, and 200X?	All precipitation data for specific areas during selected years
	Which lakes in development area X are deep enough to support fish?	All data for variable X (water depth, maximum) in geographic extent X
	What data are available to understand fluctuations in water level in lakes where ice roads are planned?	All water level data under general category of inland waters for all



# Data Rescue, Normalization, and Ingestion



1054 FWS_1991_Lake013	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.8294444 62.8370.0
1055 FWS_1991_Lake014	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.894444 62.70.1333
1056 FWS_1991_Lake015	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.81 62.76666
1057 FWS_1991_Lake016	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.870108333
1058 FWS_1991_Lake017	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.768333 70.1
1059 FWS_1991_Lake018	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.748333 70.1
1060 FWS_1991_Lake019	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.755 70.0883
1061 FWS_1991_Lake020	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.65333 70.07
1062 FWS_1991_Lake021	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.735 70.0616
1063 FWS_1991_Lake022	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.741666 70.0
1064 FWS_1991_Lake023	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.698333 70.0
1065 FWS_1991_Lake024	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.676666 70.0
1066 FWS_1991_Lake025	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.7125 70.044
1067 FWS_1991_Lake026	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.65333 70.69
1068 FWS_1991_Lake027	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.658333 70.3
1069 FWS_1991_Lake028	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.613333 70.0
1070 FWS_1991_Lake029	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.596666 70.0
1071 FWS_1991_Lake030	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.62 70.04666
1072 FWS_1991_Lake031	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.624444 70.9
1073 FWS_1991_Lake032	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.601666 70.0
1074 FWS_1991_Lake033	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.551666 70.0
1075 FWS_1991_Lake034	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.520833 70.0
1076 FWS_1991_Lake035	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.458333 70.0
1077 FWS_1991_Lake036	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.381944 70.0
1078 FWS_1991_Lake037	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.333333 70.4
1079 FWS_1991_Lake038	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.37002777
1080 FWS_1991_Lake039	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.261666 70.0
1081 FWS_1991_Lake040	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.745833 69.7
1082 FWS_1991_Lake041	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.43833333 70.0
1083 FWS_1991_Lake042	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.438888 69.9
1084 FWS_1991_Lake043	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.385 69.99
1085 FWS_1991_Lake044	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.113333 69.8
1086 FWS_1991_Lake045	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-144.605 69.8758
1087 FWS_1991_Lake046	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-144.261111 69.8
1088 FWS_1991_Lake047	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-144.218888 69.9
1089 FWS_1991_Lake048	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-144.111666 69.9
1090 FWS_1991_Lake049	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-144.333333 69.8
1091 FWS_1991_Lake050	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-145.595 70.015
1092 FWS_1991_Lake051	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.997777 69.9
1093 FWS_1991_Lake052	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.978611 69.9
1094 FWS_1991_Lake053	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.921666 69.9
1095 FWS_1991_Lake054	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.998611 69.9
1096 FWS_1991_Lake055	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.985 69.985
1097 FWS_1991_Lake056	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.933333 69.9
1098 FWS_1991_Lake057	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.925 69.925
1099 FWS_1991_Lake058	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.931666 69.9
1100 FWS_1991_Lake059	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.986666 69.9
1101 FWS_1991_Lake060	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.998333 69.9
1102 FWS_1991_Lake061	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.991666 69.9
1103 FWS_1991_Lake062	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.991666 69.9
1104 FWS_1991_Lake063	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.851666 69.8
1105 FWS_1991_Lake064	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.656111 69.8
1106 FWS_1991_Lake065	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.603611 69.9
1107 FWS_1991_Lake066	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.553333 69.8
1108 FWS_1991_Lake067	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.541666 69.8
1109 FWS_1991_Lake068	Point	48	NGVD29	AK	North Slope Borough	3	POINT (-143.52555 69.84

83 70.0  
70.1333  
83 70.1  
83 70.0  
83 70.1  
11 69.89  
444 69.  
111 69.  
88 69.9  
83 69.7  
66 69.8  
444 69.

# Station Identity Issues????

Kotzebue WSO AP, Kotzebue Ralph Wein Memorial, Kotzebue FAA AP, Ralph Wein Memorial AP

Begin Date	End Date	Stn Name	Name Type	Stn Type	COOP	WBAN
<a href="#">[2010-11-25]</a>	Current	KOTZEBUE WSO AP	COOP NAME	ASOS, ASOS-NWS, COOP, COOP-A, COOPERATIVE SUB-NETWORK- A, LAND SURFACE	505076	26616
		KOTZEBUE RALPH WEIN MEMORIAL AP	PRINCIPAL NAME			
<a href="#">[1997-12-01]</a>	2010-11-25	KOTZEBUE WSO AIRPORT	COOP NAME	ASOS, ASOS-NWS, COOP, LAND SURFACE	505076	26616
		KOTZEBUE RALPH WEIN MEMORIAL AP	PRINCIPAL NAME			
<a href="#">[1981-12-31]</a>	1997-12-01	KOTZEBUE WSO AIRPORT	COOP NAME	COOP, LAND SURFACE	505076	26616
		KOTZEBUE RALPH WEIN MEMORIAL AP	PRINCIPAL NAME			
<a href="#">[1973-01-01]</a>	1981-12-31	KOTZEBUE WSO AIRPORT	COOP NAME	COOP, LAND SURFACE, WSO	505076	26616
		KOTZEBUE RALPH WEIN MEMORIAL AP	PRINCIPAL NAME			
<a href="#">[1969-01-01]</a>	1973-01-01	KOTZEBUE WSO AIRPORT	COOP NAME	COOP, LAND SURFACE, WBO	505076	26616
		KOTZEBUE RALPH WEIN MEMORIAL AP	PRINCIPAL NAME			
<a href="#">[1962-12-01]</a>	1969-01-01	KOTZEBUE WSO AIRPORT	COOP NAME	COOP, LAND SURFACE, WBAS	505076	26616
		KOTZEBUE RALPH WEIN MEMORIAL AP	PRINCIPAL NAME			
<a href="#">[1946-09-01]</a>	1962-12-01	KOTZEBUE WSO AIRPORT	COOP NAME	COOP, LAND SURFACE, WBAS	505076	26616
		KOTZEBUE FAA AP	PRINCIPAL NAME			
<a href="#">[1944-01-01]</a>	1946-09-01	KOTZEBUE FAA AP	PRINCIPAL NAME	LAND SURFACE, WBAS	---	26616
<a href="#">[1943-01-01]</a>	1944-01-01	KOTZEBUE FAA AP	PRINCIPAL NAME	LAND SURFACE, WBAS	---	26616
<a href="#">[1942-10-26]</a>	1943-01-01	KOTZEBUE FAA AP	PRINCIPAL NAME	LAND SURFACE, SA	---	26616
<a href="#">[1930-09-01]</a>	1942-10-26	RALPH WEIN MEMORIAL AP	PRINCIPAL NAME	LAND SURFACE, SA	---	26616

Mozilla Firefox

noaa.gov https://mi3.ncdc.noaa.gov/mi3qry/mapStations.cfm

Map Satellite

50 mi  
50 km

Map data ©2011 Google

Done

70.574285,-152.259598

Search Maps Show search options

1000 ft  
200 m

©2011 Google - Imagery ©2011 DigitalGlobe, GeoEye, Map data ©2011 Google -

©2011 Google - Imagery ©2011 DigitalGlobe, GeoEye, Map data ©2011 Google -

# Template

- Supplemented by SOP for appending database
- 14 Tables (worksheets)
- 13 lists with controlled vocab
- Consolidate & simplify template → load with SSIS or import wizard

Home Insert Page Layout Formulas Data Review View Developer Add-Ins Acrobat

Q9

	A	B	C	F	G	H	I	J	Req
1	Required	Required	Required	Required		Required	Required	Required	Req
2	integer	text(255)	text(MAX)	text(50)	text(500)	text(255)	text(255)	text(255)	text(
3	PrimaryKey			list					
4									
5	SourceID	Organization	SourceDescription	SourceRole	SourceLink	ContactName	Phone	Email	Add
6	1000	ASDN	Arctic Shorebird Demog	originator		River Gates			
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Ready

CV Lists 1\_ISOMetadata 2\_Sources 3\_Sites 4\_Categories\_optional 5\_Variables 6\_Devices

greta: Primary key. Unique integer identifier. Note that each source is associated with a unique citation. (see citation field).

greta: Name of the organization that collected or published the data.

greta: A more detailed description of where the data was actually obtained and/or is currently stored. For example, data were obtained from a scanned report (see citation link) and are now stored in a csv file on XXXX XXXX's computer in documents/sources/XXXX/XXXX/XXXX.csv."

Is the source listed the 'originator' or a 'publisher'?

greta: Link that can be pointed at the original data file, associated metadata, and/or project website. To add more than one link separate with 'AND'. For example: <http://www.xxxxx.com> AND <http://www.yyyyy.com>.

Home Insert Page Layout Formulas Data Review View Developer Add-Ins Acrobat

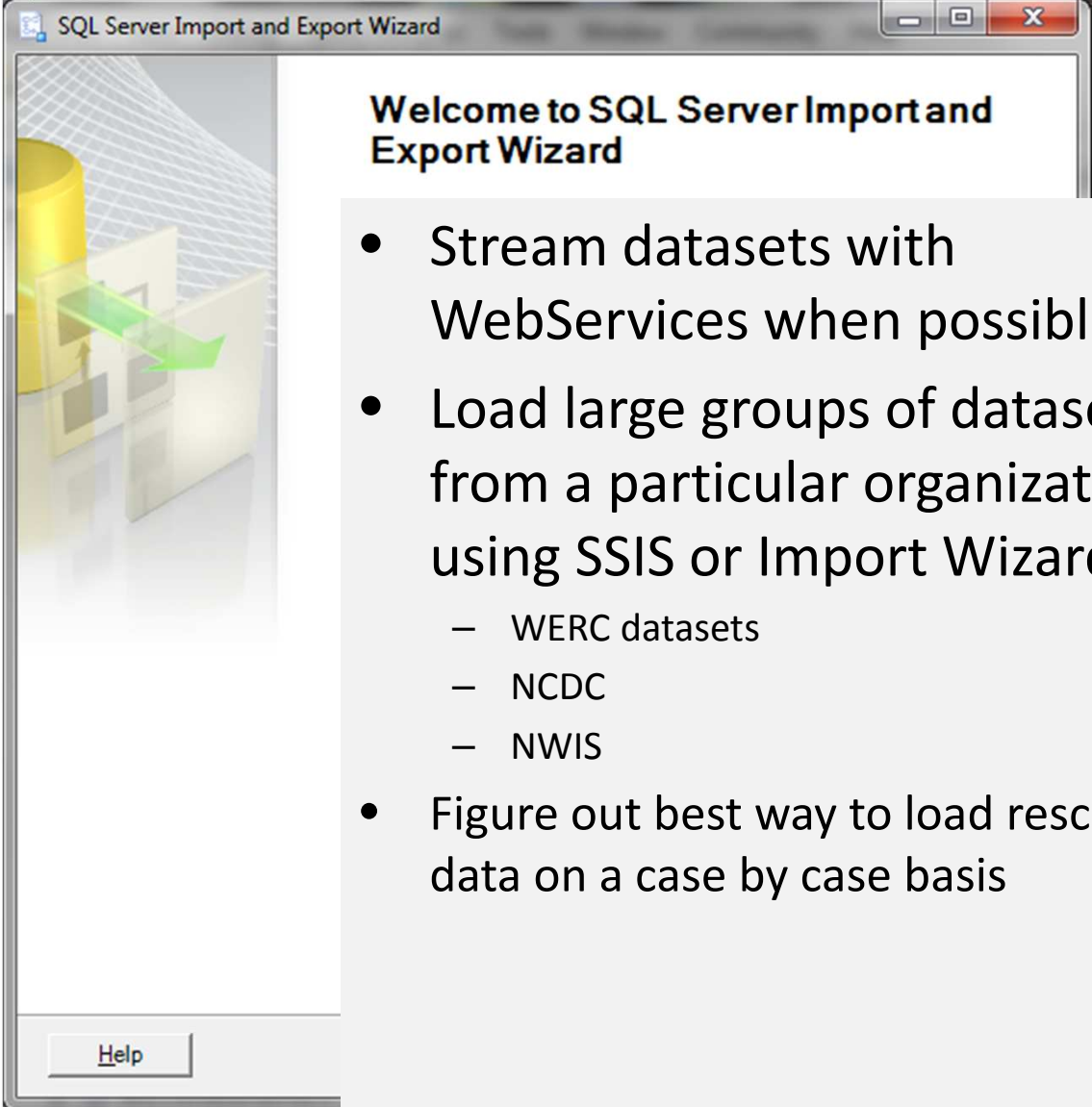
J39

	A	B	C	D	E	F	H	I	J	K	L	M
1	Required	Required	Required	Required	Required	Required	Required	Required	Required	Required	Required	Required
2	integer	text(255)	text(50)	integer	text(255)	float	text(255)	text(255)	text(255)	text(255)	integer	text(MAX)
3	PrimaryKey										list	text(MAX)
4												formulas
5	SiteID	SiteCode	SiteName	SpatialCharacter	Source	VerticalData	PosAccuracy	State	Country	Comments	LatLongD	Geolocation
6	1000	ASDN_Nome_met	soms	point	1000	Unknown	unknown	AK			NAD83	point(-164.36208 64.44272)
7	1000	ASDN_Cape Krusenstern	cakr	point	1000	Unknown	unknown	AK			NAD83	point()
8	10002	ASDN_Barrow_met	barr	point	1000	Unknown	unknown	AK			NAD83	point()
9	10003	ASDN_Ikpikuk_met	ikpi	point	1000	Unknown	unknown	AK			NAD83	point(-154.73336 70.55223)
10	10004	ASDN_Prudhoe Bay_met	prbs	point	1000	Unknown	unknown	AK			NAD83	point()
11	10005	ASDN_Canning River_met	car	point	1000	Unknown	unknown	AK			NAD83	point(-145.85062 70.11735)
12	10006	ASDN_Mackenzie Delta	mds	point	1000	Unknown	unknown				NAD83	point(-154.801958406 63.371056614)
13	10007	ASDN_East Bay_met	cbay	point	1000	Unknown	unknown				NAD83	point()
14	10008	ASDN_Churchill_met	chur	point	1000	Unknown	unknown				NAD83	point()
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Ready

CV Lists 1\_ISOMetadata 2\_Sources 3\_Sites 4\_Categories\_optional 5\_Variables 6\_Devices\_optional 7\_OffsetTypes 8-Methods\_optional 9\_Datastreams 10\_Qualifiers\_optional 11\_GroupDescriptions\_optional 12\_Groups\_optional 13\_DerivedFrom\_optional

# Loading Data



SQL Server Import and Export Wizard

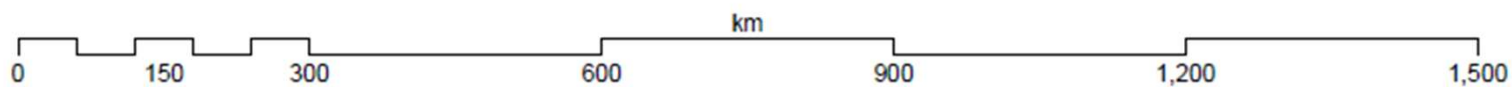
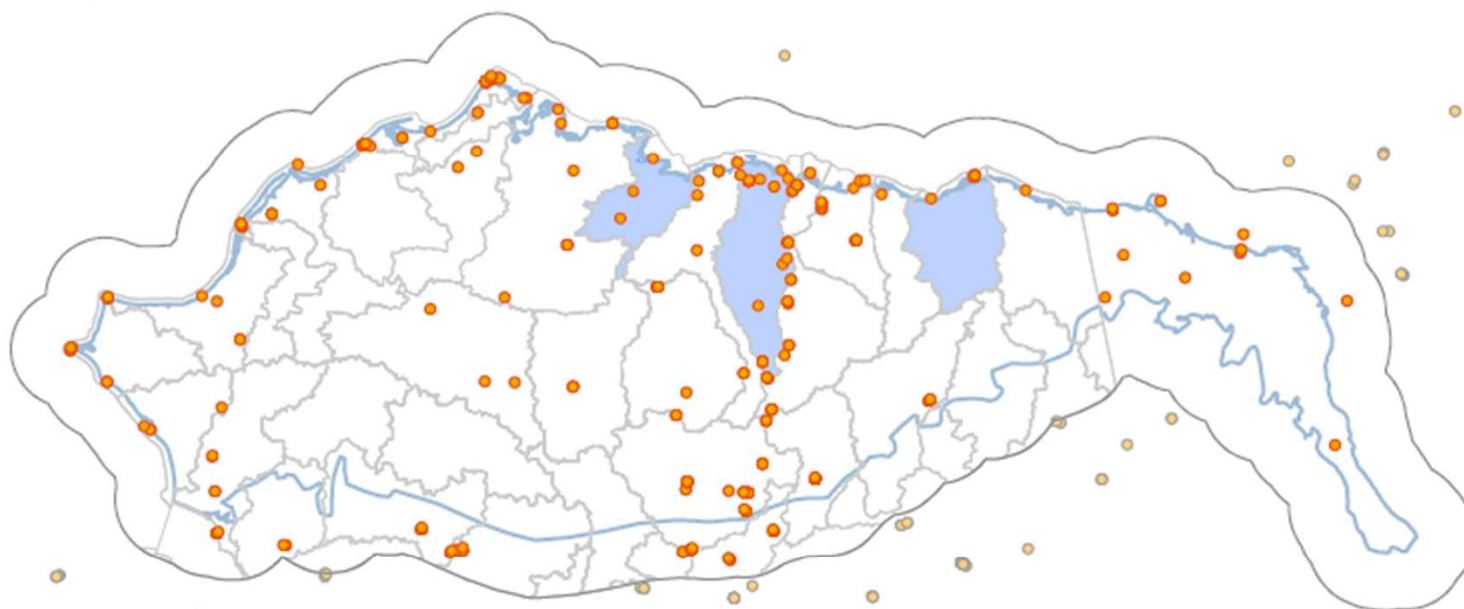
Welcome to SQL Server Import and Export Wizard

- Stream datasets with WebServices when possible
- Load large groups of datasets from a particular organization using SSIS or Import Wizard
  - WERC datasets
  - NCDC
  - NWIS
- Figure out best way to load rescued data on a case by case basis

Help

# NCDC Weather Stations

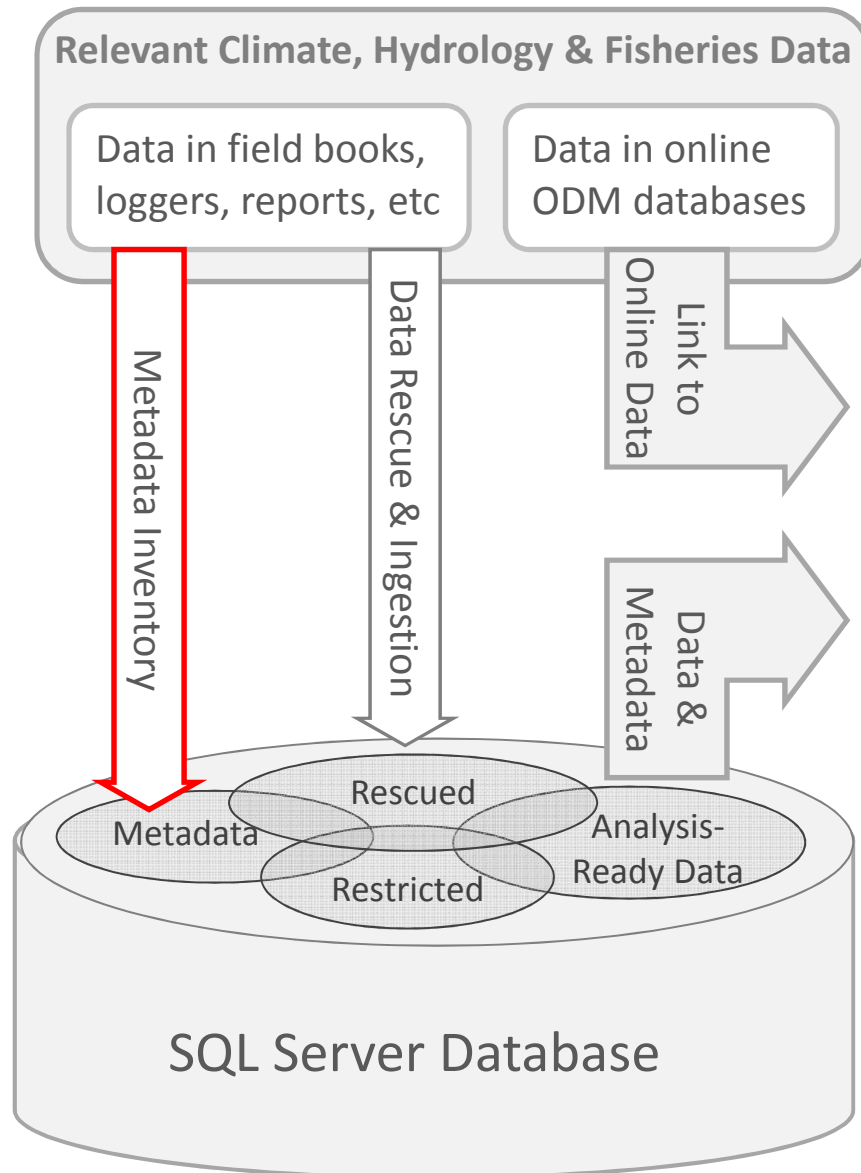
- Stations
- 60 km buffer
- ArcticLCC\_Boundary



# Phase 1 -- So let's get started

- We need a container to hold the data
- We need an interface for queries, visualizations, and downloading data
- We need to acquire and ingest metadata

# We need to acquire and ingest metadata



### Website

I. Geo-Inventory

II. Geo-Database

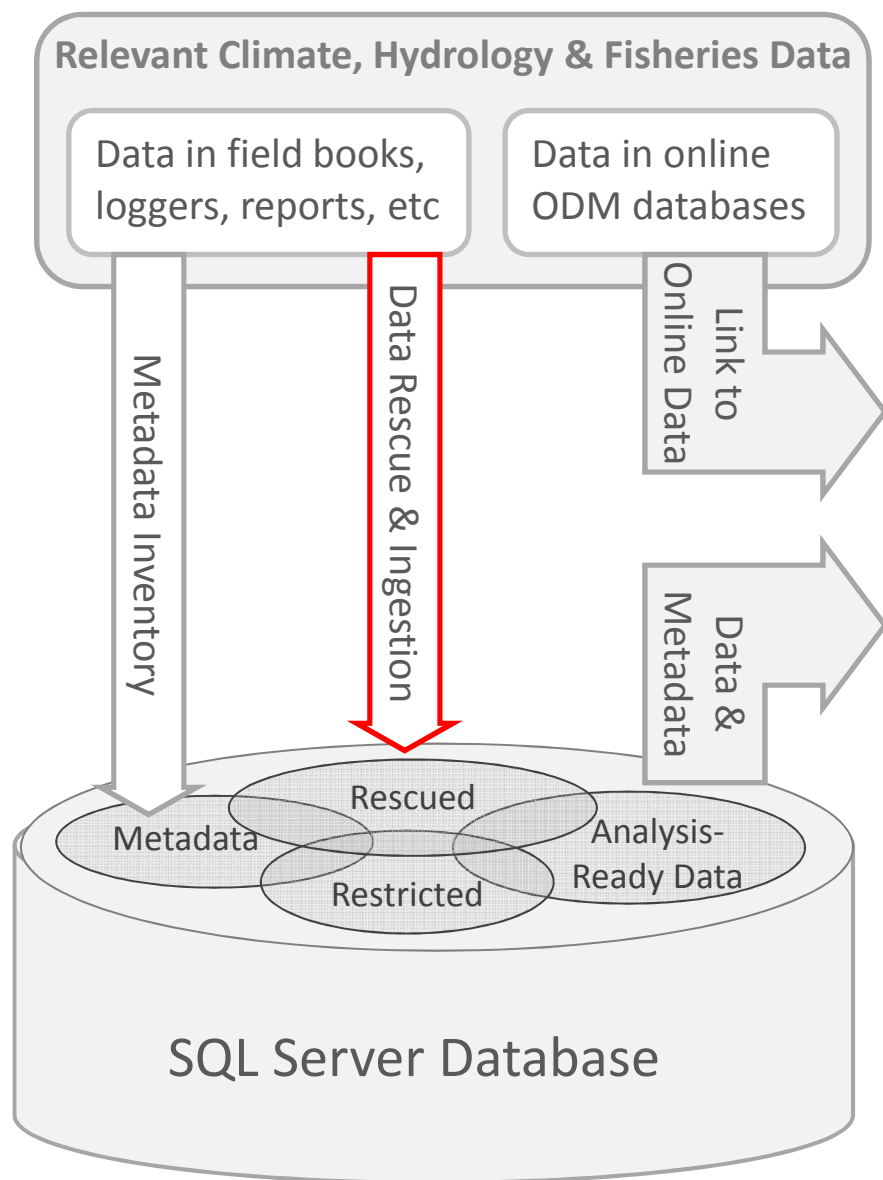
site	dates	Variable, medium	citation	source	Sample interval
Mne SiteB	xxx-xxx	Temperature, air	xxxx,xxx ,xxxxxxx	UAF, WERC	hourly
Mne SiteB	xxx-xxx	Water Level, surface water	xxxx,xxx ,xxxxxxx	UAF, WERC	hourly
Lake 9713	xxx-xxx	Fish Presence, surface water	xxxx,xxx ,xxxxxxx	AKDFG	sporadic

## Metadata Inventory

- Identify data sources
- Acquiring metadata
- Interpret, format, standardize, create and upload metadata



# Phase 2 – Populating the Database



## Website

### I. Geo-Inventory

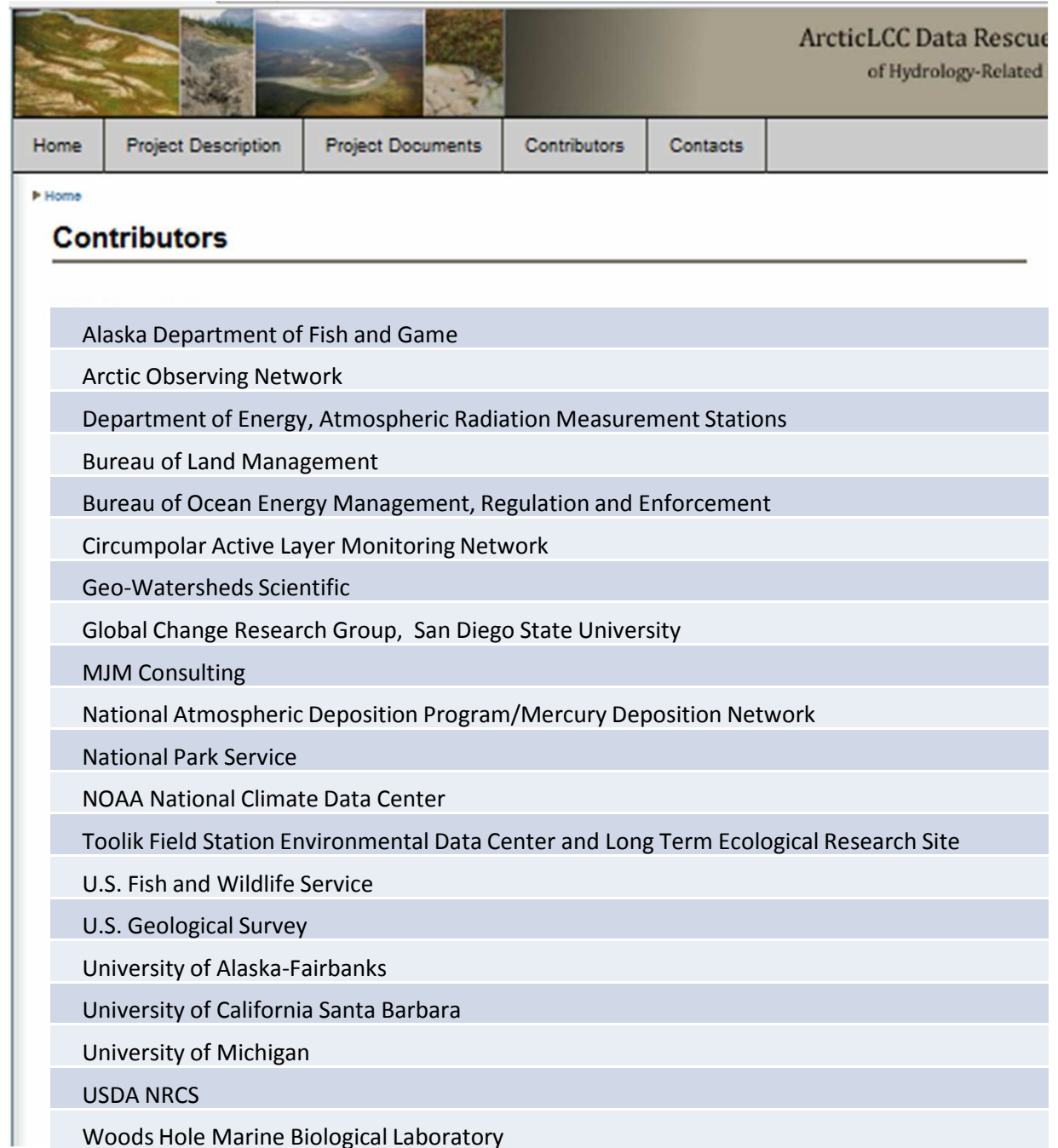
### II. Geo-Database

site	dates	Variable, medium	citation	source	Sample interval
Mne SiteB	xxx-xxx	Temperature, air	xxxx,xxx ,xxxxxx	UAF, WERC	hourly
Mne SiteB	xxx-xxx	Water Level, surface water	xxxx,xxx ,xxxxxx	UAF, WERC	hourly
Lake 9713	xxx-xxx	Fish Presence, surface water	xxxx,xxx ,xxxxxx	AKDRG	sporadic

- Acquire and archive data
- Rescue as needed
- Interpret, format, normalize, and ingest data

# Data Entry

- Interpreted, normalized and ingested into tables:
  - Isometadata (21)
  - Organizations (20)
  - Source (75)
  - Sites (5000+)
  - Variables (74)
  - Data Streams (634)
  - **Data Values -- 216,000 from 415 Data Streams (150 sites)**
  - **Raw Data Values – millions**



The screenshot shows the ArcticLCC Data Rescue website. The header includes the title "ArcticLCC Data Rescue of Hydrology-Related" and a navigation menu with links for Home, Project Description, Project Documents, Contributors, and Contacts. The main content area is titled "Contributors" and lists 20 organizations in a vertical list:

- Alaska Department of Fish and Game
- Arctic Observing Network
- Department of Energy, Atmospheric Radiation Measurement Stations
- Bureau of Land Management
- Bureau of Ocean Energy Management, Regulation and Enforcement
- Circumpolar Active Layer Monitoring Network
- Geo-Watersheds Scientific
- Global Change Research Group, San Diego State University
- MJM Consulting
- National Atmospheric Deposition Program/Mercury Deposition Network
- National Park Service
- NOAA National Climate Data Center
- Toolik Field Station Environmental Data Center and Long Term Ecological Research Site
- U.S. Fish and Wildlife Service
- U.S. Geological Survey
- University of Alaska-Fairbanks
- University of California Santa Barbara
- University of Michigan
- USDA NRCS
- Woods Hole Marine Biological Laboratory

# Metadata Inventory

- Identified data sources
- Acquired metadata
- Interpreted, reformatted, standardized, and entered metadata
- **Organizations (20)**
- **Source (70+)**
- **Site (5000)**
- **Variables (74)**
- **Data Streams (634)**

