Sharing Historical Maps and Atlases in Web Apps

Aileen Buckley

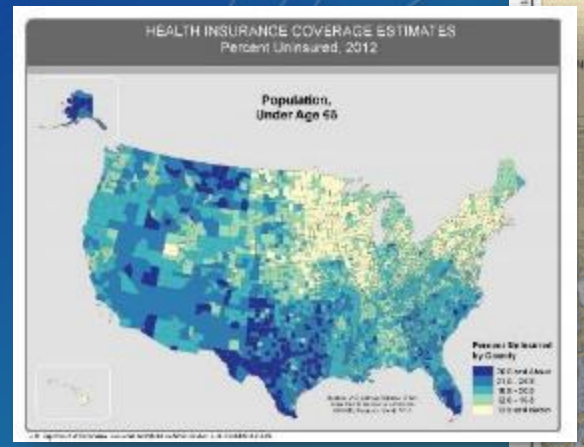
Outline

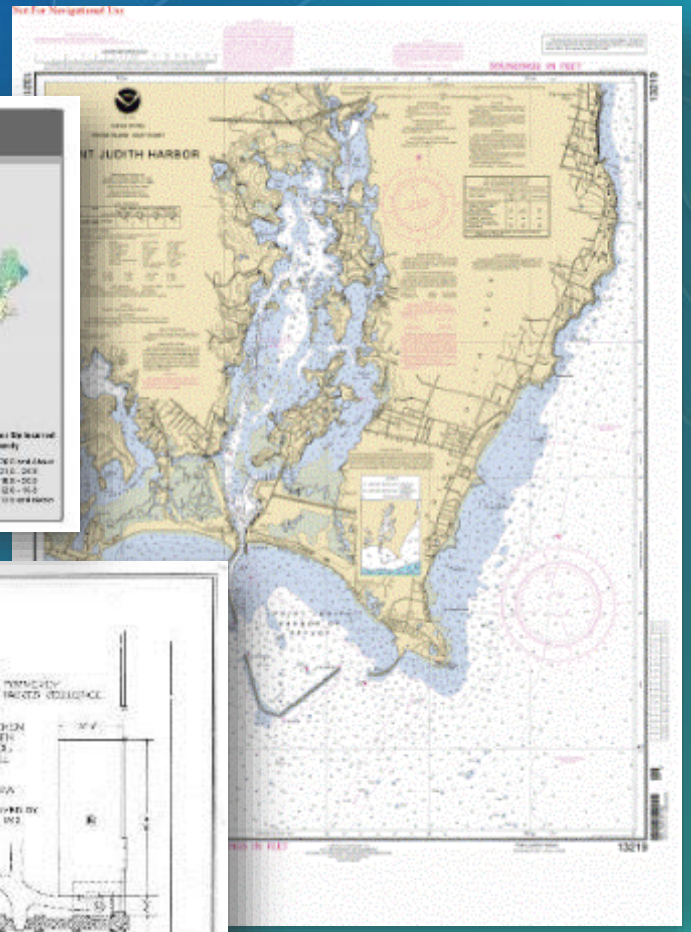
- Introduction
- Project Planning
- Examples
- Workflow
  - Metadata
  - Scanning
  - Georeferencing
  - Mosaic Dataset
  - Image Service
  - Web App
- Wrap Up
- Resources

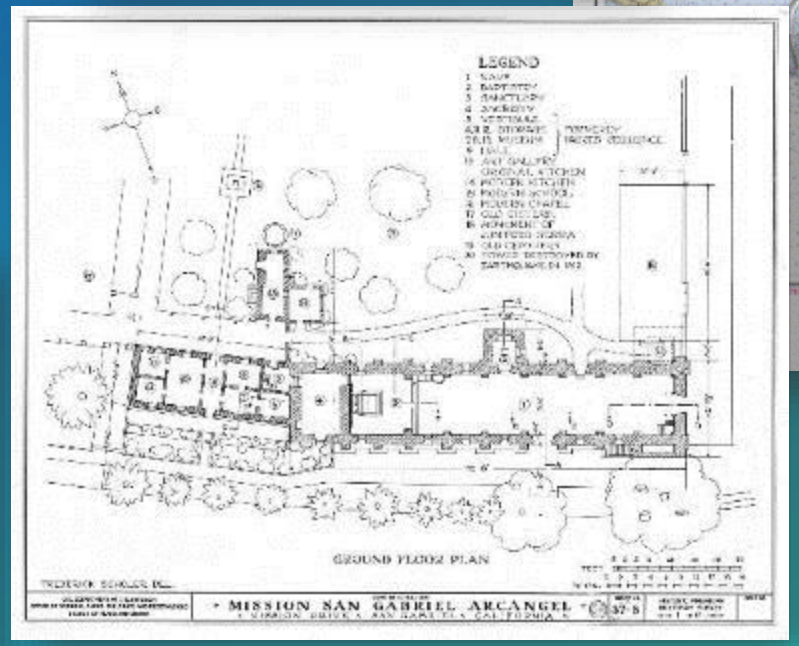
Introduction

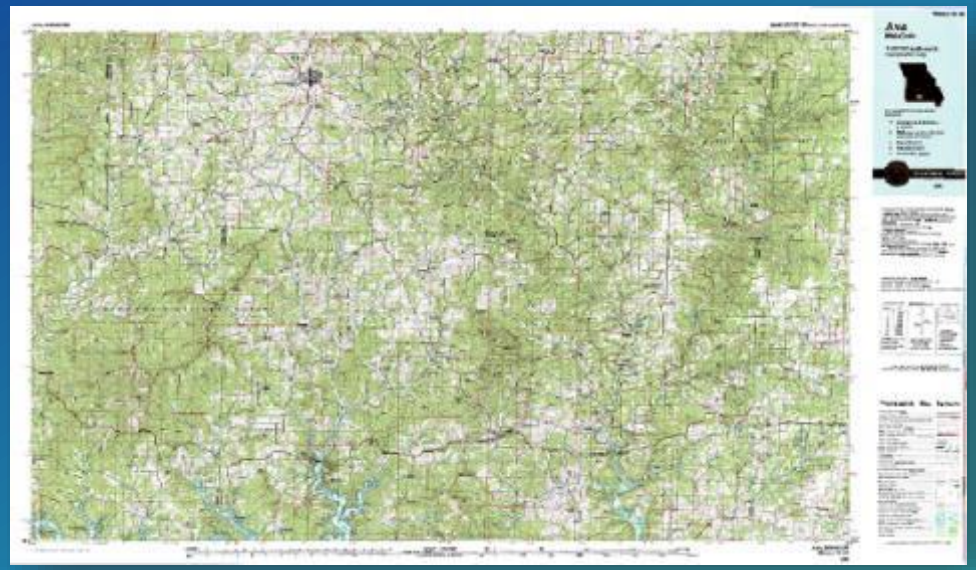
Types of Historical Maps

- Topographic maps
- Thematic maps
- Navigation maps
- Engineering drawings
- Atlas pages









National agencies, private companies, NGOs, …

Utility of Historical Maps

- **Provide a record of past landscapes**
- **Record changes through time**
- **Provide a record of geographical knowledge or perceptions from a given period of time**
- **Constitute a record of cartographic and printing technology**
- **Provide insights into the values, beliefs, and social structures surrounding the creation of the maps**

- **However, the current presumption is that maps of any value are created in digital form or are made available in digital form**

Summarized by Baruth (2000) from Skelton (1972) and Harley and Woodward (1987)

Users of Historical Maps

- **Preservation of map images**
  - **Primarily librarians and curators of collections**
- **Access and utilization of geographic data and map images**
  - **Librarians**
  - **GIS analysts**
  - **Scientists**
  - **Historians**
  - **Genealogists**
  - **Many others . . . .**

It is not possible to fully predict all users of published georeferenced maps

Uses of Historical Maps

- Land resource management
  - Urbanization
  - Forest plot perimeters
  - Wetlands
  - Agriculture
  - Glaciers
  - Land/water boundaries
  - Political boundaries
- Historical analysis
- Navigation
- Adventure/exploration

Project Planning

Defining the Project

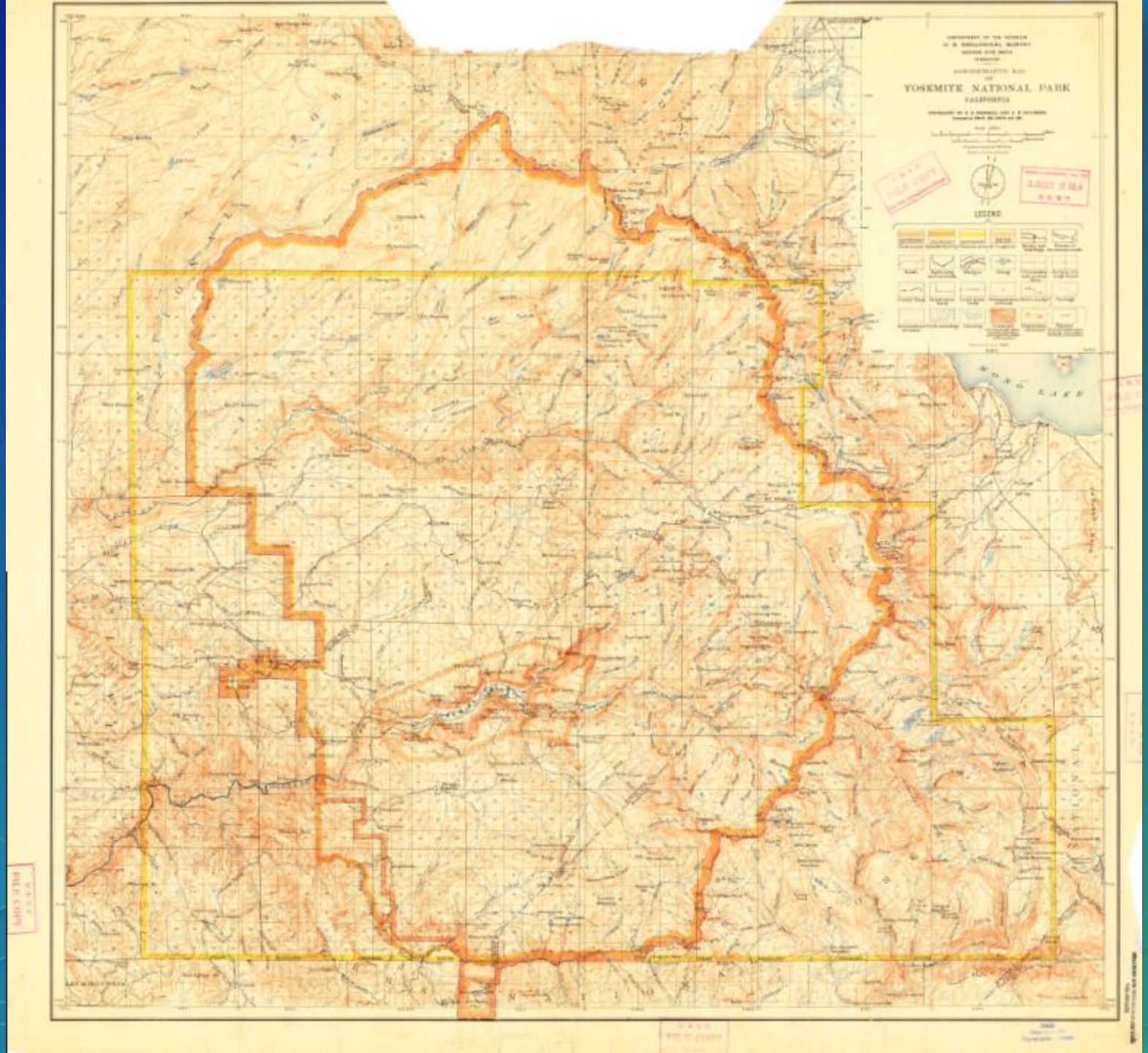
- It’s best to conform to your organization’s mission and needs
- Do not expect you can digitize (scan and georeference) all the maps in your collection (at least at the outset)
- Selection criteria:
  - Should the maps be digitized?
  - Are the maps in a suitable condition to be digitized?
  - Are there any issues preventing distribution of the maps?
  - Is the infrastructure and technical ability in place?
- Good planning and testing will ease and shape the scope of the project
- Preservation and/or restoration can be a by-product of digitization
- Determine how people may use the digitized maps

Modified from Janet Gertz, Columbia University Library

Maps in the Collection

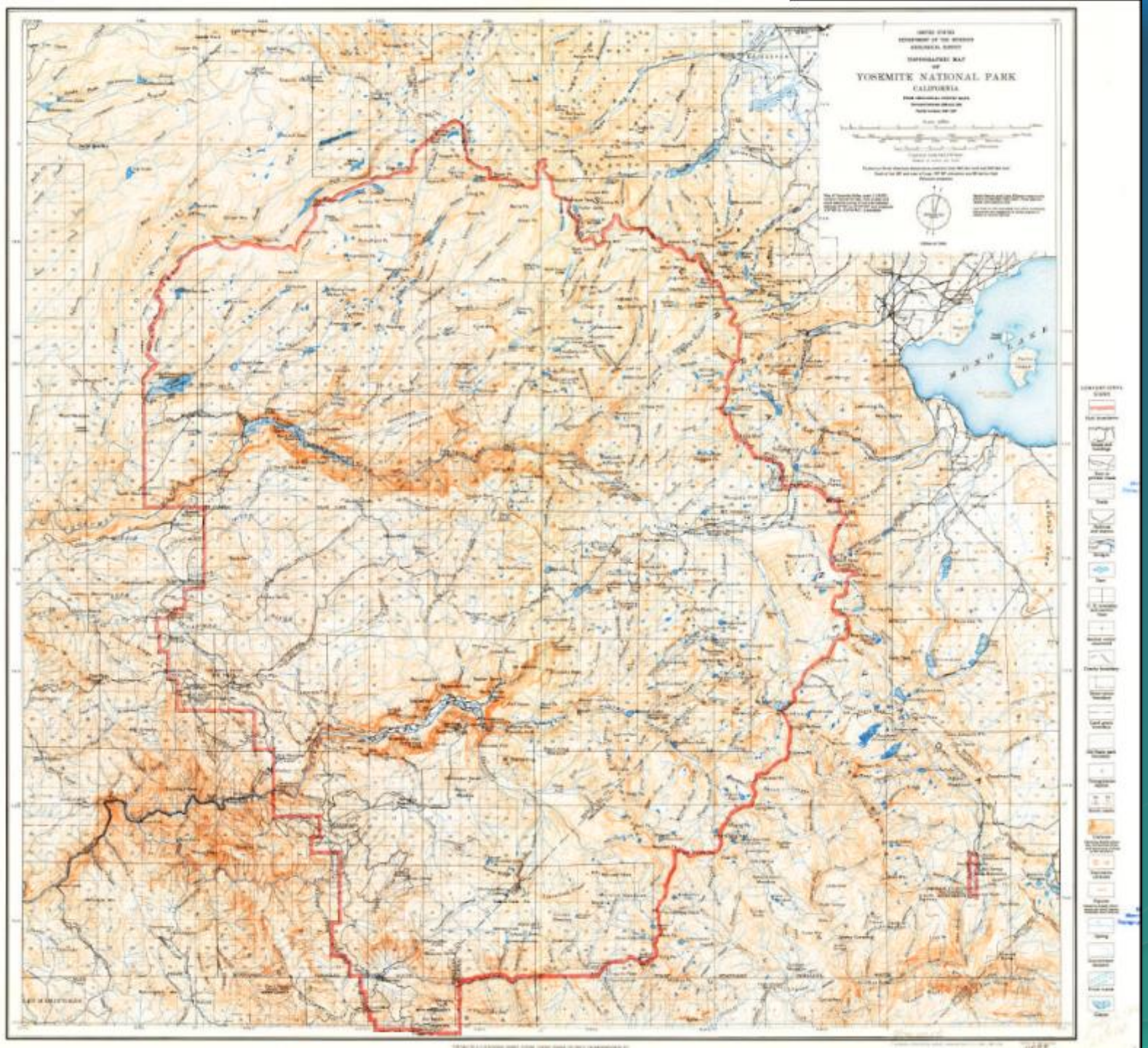
- Single or small number of maps
- Collections
  - Quadrangle maps (control points at the corners, along edges, and in the interior)
  - Maps with control points
  - Maps with no control points

Yosemite
1909
1:125,000



Yosemite
1929
1:125,000

Yosemite
1948
1:125,000



Yosemite
1953
1:125,000

Yosemite
1953 (2)
1:125,000

Yosemite Valley
1958
1:24,000

Yosemite Valley
1958
1:24,000

Yosemite Valley Floor
1934
1:2,400

Yosemite Valley Floor
1934
1:2,400

Final Tips

- Remain true to the mission and goals of the agency
- Take as much time as is needed at the outset of a project to clearly define its goals and outcomes
- Insist on the highest quality technical work that the institution can afford
- Build in costs and capabilities for long-term maintenance of the digitized materials
- Cultivate a high level of staff involvement for digital projects
- Cooperate with other institutions whenever possible to achieve the greatest benefits
- Share experiences and results with other institutions or agencies

From Handbooks for Digital I Projects: A Management Tool for Preservation and Access

Unused digital products might as well not exist.

Greg Allord, Esri Contractor

Examples

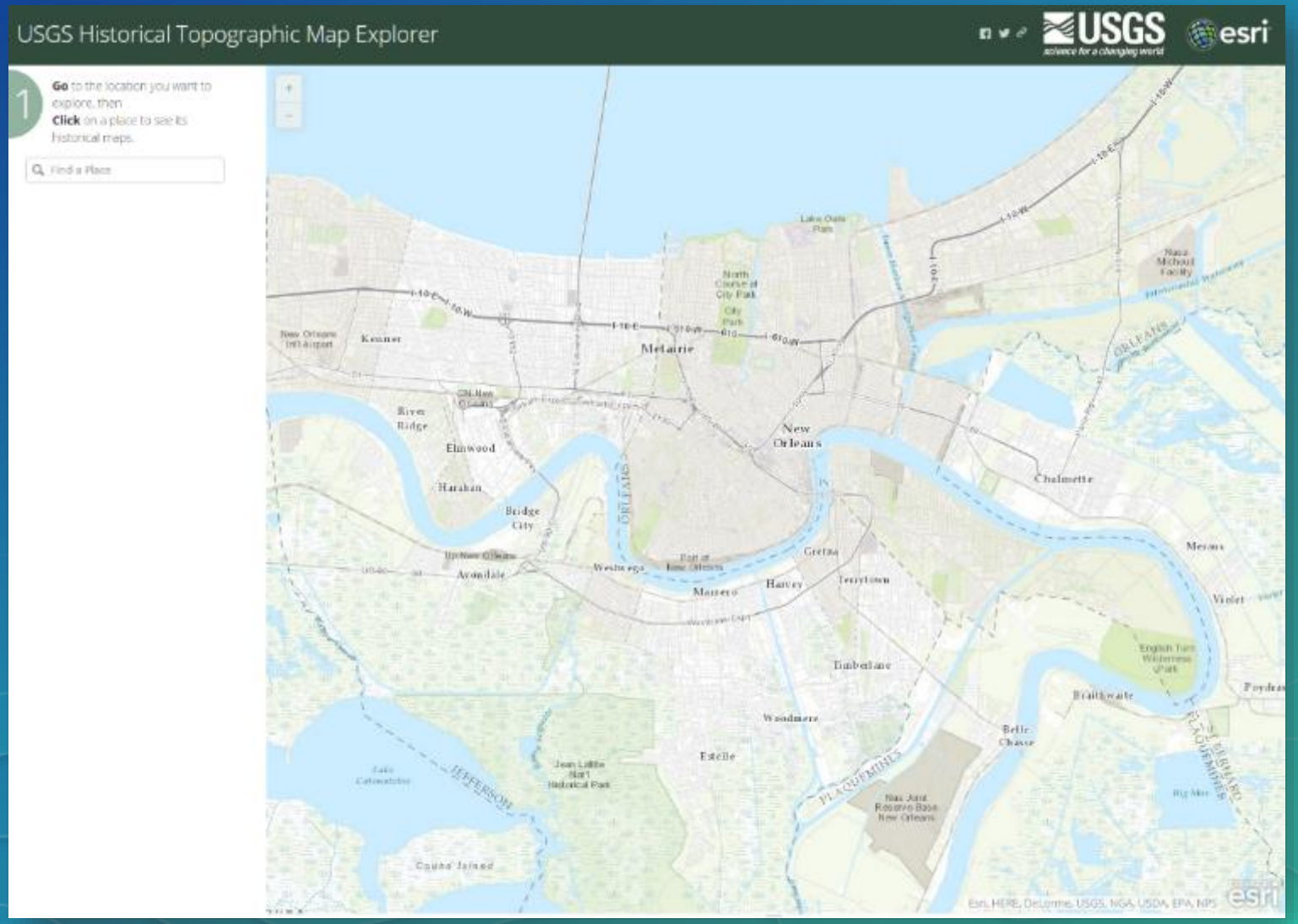
The Goal

Subhead Here

- Create an interactive online collection of maps that would include…
  - Archival quality images of maps in the collection
  - The ability to select, compare, and download the images
  - The ability to share the collection with others
- …providing a rich and engaging online experience to increase the use of the collection while at the same time archiving the maps.

USGS Historical Topographic Map Explorer

- Almost 186,000 maps
- Simple, intuitive web application (app)



USGS Historical Topographic Map Explorer

Go to the location you want to explore, then
Click on a place to see its historical maps.

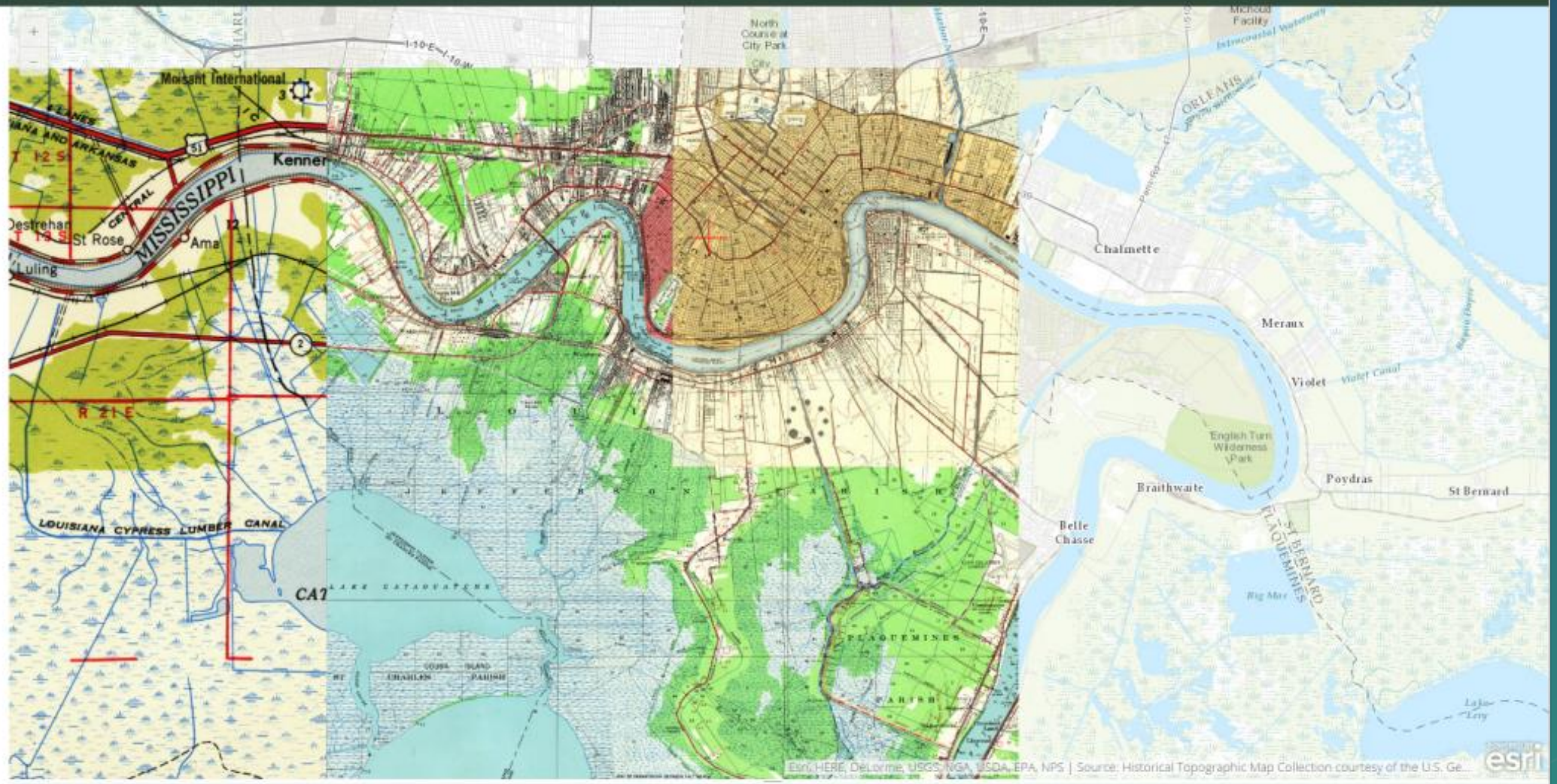
Find a Place

3 **Slide** transparency on map to compare, or drag/drop to re-order maps.

New Orleans East
1939
download map

New Orleans
1954
download map

New Orleans
1945
download map



Historical Map Scales

250,000
125,000
62,500
24,000
12,000

Yosemite National Park Service

Go to the location you want to explore, then **Click** on a place to see its historical maps.

Find a place

3 **Slide** transparency on map to compare, or drag/drop to re-order maps.

Yosemite Valley Floor National Park Sheet 1
1934
download map

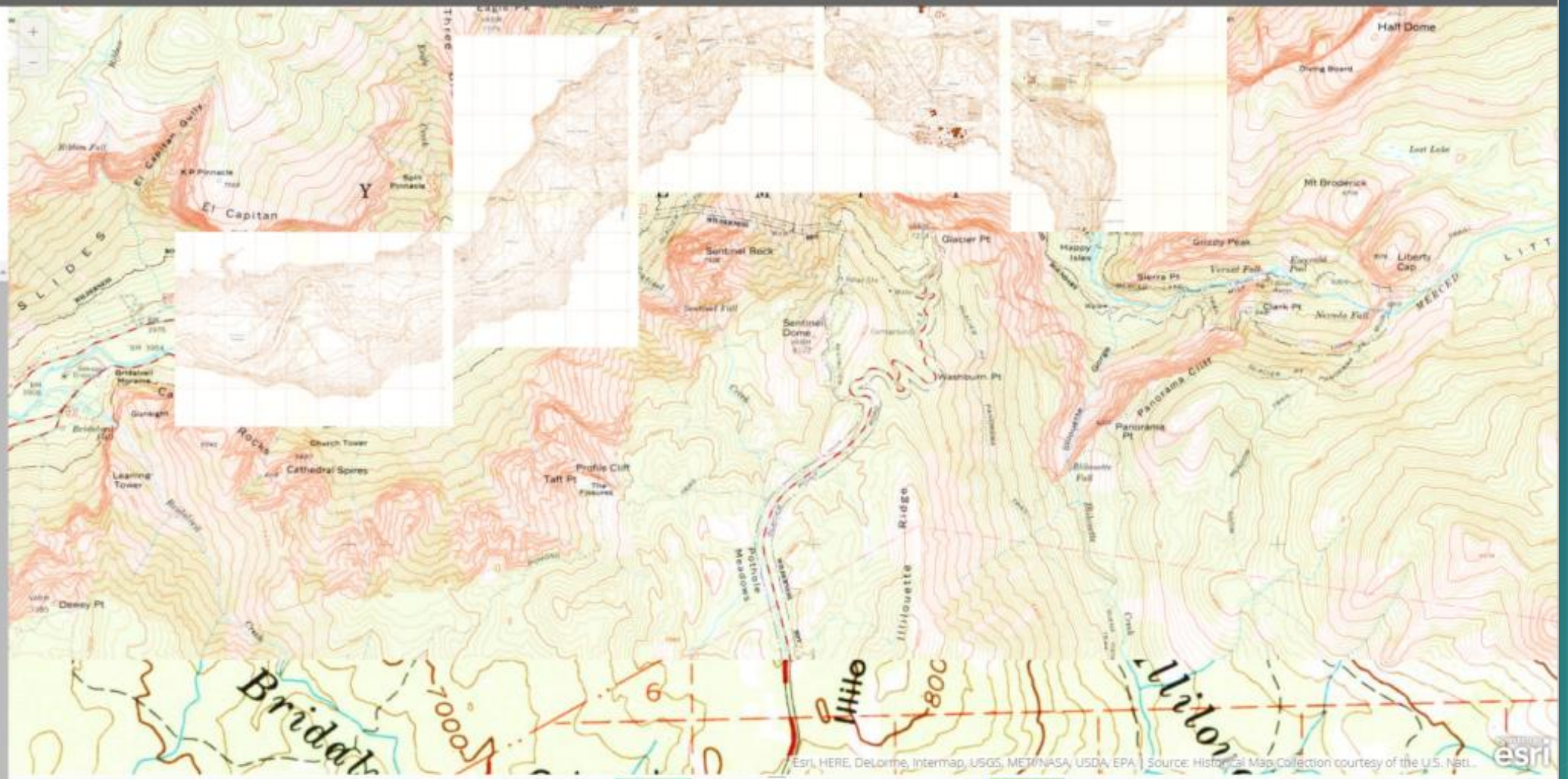
Yosemite Valley Floor National Park Sheet 2
1934
download map

Yosemite Valley Floor National Park Sheet 3
1934
download map

Yosemite Valley Floor National Park Sheet 4
1934
download map

Yosemite Valley Floor National Park Sheet 5
1934
download map

Yosemite National

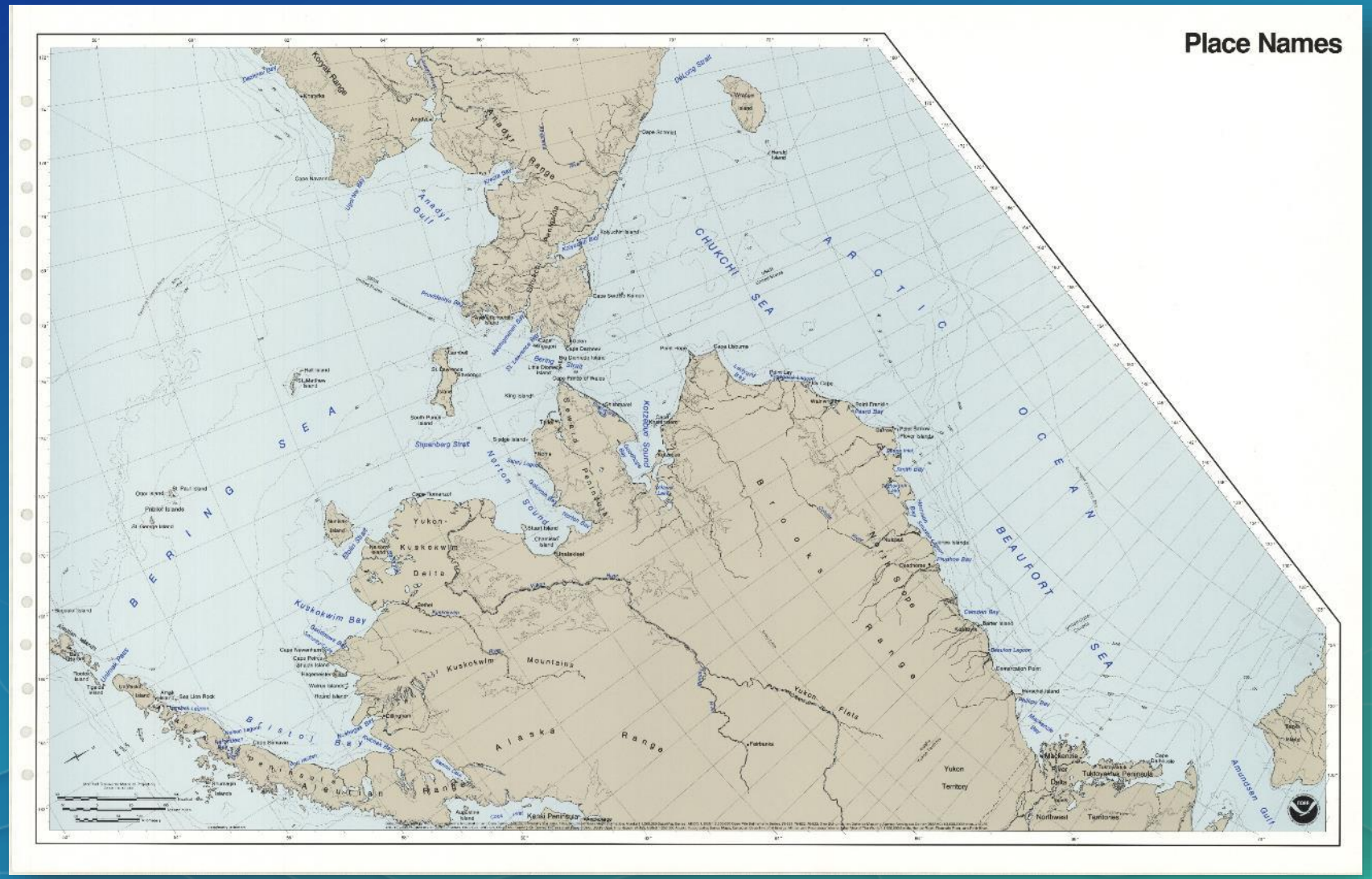


Historical Map Scales

- 125,000
- 24,000
- 2,400

Bering, Chukchi, and Beaufort Seas Strategic Assessment: Data Atlas

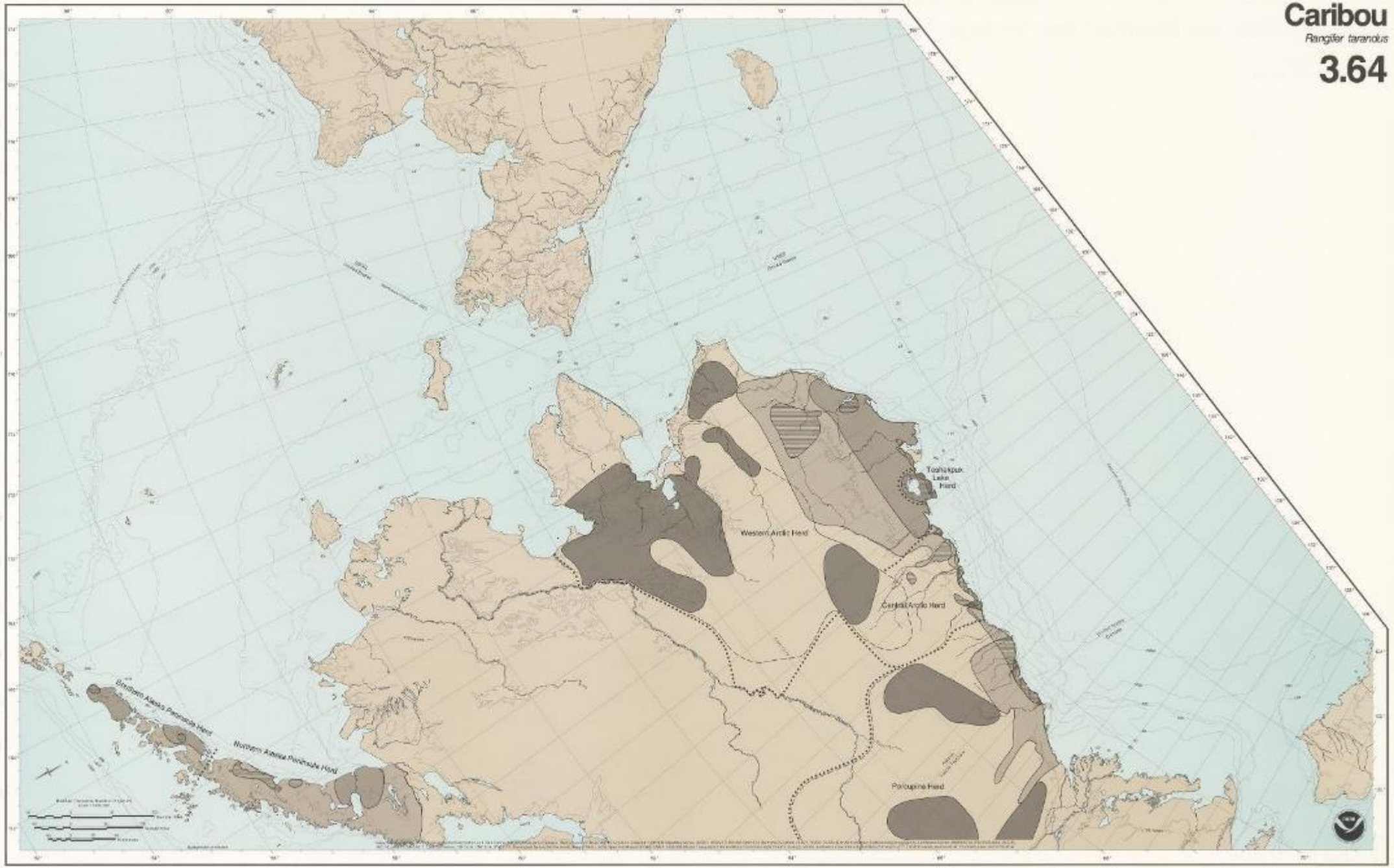
- NOAA
- 99 maps
- 2 phases
- Maps, legends, text, drawings



Caribou

Rangifer tarandus

3.64



Bering, Chukchi, and Beaufort Seas Strategic Assessment: Data Atlas

Strategic Assessment Branch
Ocean Assessments Division
Office of Oceanography and Marine Assessment
National Ocean Service
National Oceanic and Atmospheric Administration

Caribou

Rangifer tarandus

3.64

Description

Category

Mammal

Classification

Class—Mammalia
Order—Artiodactyla
Family—Cervidae

Name

Caribou, *Rangifer tarandus*

Legal Status

Protected under Alaska Statutes and Alaska Administrative Code. Alaskan herds managed by Alaska Department of Fish & Game; Canadian herds managed under Department of Renewable Resources (Yukon Wildlife Branch and Northwest Territories Wildlife Service).

Range

Worldwide (Banfield, 1961)—Holarctic (including closely related reindeer); continental North America, Canadian Arctic Archipelago, Fennoscandia, subarctic and arctic Soviet Union, northern China.

Region of Concern (Scotter, 1972; Davis, 1980; Klein and Kuzyakin, 1982; Uspenski, 1984)—Alaska Peninsula northward along Bering and Chukchi Sea coasts to Pt. Barrow, Alaska; eastward across arctic North America. Reindeer introduced on Hagemeister, St. George, St. Paul, Nunivak, Stuart, and St. Lawrence islands, and Seward Peninsula; also, on Chukchi Peninsula and Wrangel Island and at the Reindeer Preserve on the Mackenzie River Delta, Northwest Territories, Canada.

Distribution

Discrete Populations—None recognized in region of concern.

Concentrations (Skoog, 1968; Scotter, 1972; Davis, 1980; Klein and Kuzyakin, 1982; Uspenski, 1984)

- *Natural*—Caribou in Alaska and Yukon Territory considered as one population because of herds' intermingling. In Alaska, 25 herds recognized by their repeated use of distinct areas as calving grounds, including: Alaska Peninsula herd, western arctic herd, Teshekpuk Lake herd, central arctic herd, and Porcupine herd.
- *Commercial*—Subsistence use by local residents. Sport hunting.

Habitat (Kelsall, 1968; Skoog, 1968; Klein, 1970)

Type—Arctic and alpine tundra, shrub tundra, riparian zone, coastal and delta areas, and forest-tundra ecotone.

Physical/Chemical—Air temperatures −50° to 30°C. Movements hampered by snow deeper than one meter. Extensive use of coastal areas and windswept ridges as insect-relief habitat during summer.

Life History

Social Behavior (Kelsall, 1968; Skoog, 1968)—Sexual segregation of groups during most of the year. Females congregate on traditional calving grounds just prior to parturition. Cow-calf and bull groups disperse over summer range in response to insect harassment and availability of preferred forage. All sex- and age-classes group together in fall and migrate to wintering grounds. During winter, pregnant females retain antlers, which may convey dominance to access of foraging sites.

Biological Associations (Skoog, 1968)—A principal prey of wolves (*Canis lupus*) and grizzly bears (*Ursus arctos*) throughout year; calves prey of golden eagles (*Aquila chrysaetos*) during calving period. Severe harassment during summer months by mosquitoes and oestrid flies (warble and nose bots). Parasitized by oestrid fly larvae during winter.

Nutrition (Kelsall, 1968; Skoog, 1968; Klein, 1970; Kuropat and Bryant, 1980; White and Trudell, 1980)

- *Feeding type*—Herbivore.
- *Food*—Preferred summer foods are willow and birch leaves, forbs, floral parts of cotton grasses, horsetails, and sedges. Preferred winter foods are lichens, particularly *Cladonia*, *Cetraria*, and *Usnea*. Frozen green sedges along lake margins are used preferentially during winter when available.
- *Feeding behavior*—At time of calving, flowers of cottongrass are predominant food. Subsequently, caribou switch to a diet primarily of newly emergent leaves of willow (particularly *Salix pulchra*) and dwarf birch (*Betula nana*), supplemented by floral parts of forbs, particularly legumes such as Arctic lupine (*Lupinus arcticus*) and woolly lousewort (*Pedicularis kanei*), and mushrooms. As summer progresses, caribou move upward in altitude or northward in latitude, partially in response to availability of new growth of willow, birch, and forbs. In fall, intake of lichens increases, and in winter predominant foods are sedges and lichens, obtained by cratering through snow along lake margins.
- *Feeding location*—In summer, arctic and alpine tundra, shrub tundra, and riparian zone. In winter, arctic and alpine tundra and forest-tundra ecotone.

Reproduction (Kelsall, 1968; Skoog, 1968; Bergerud, 1978)

- *Mode*—Sexual; internal fertilization; dioecious.
- *Location*—Tundra or forest-tundra ecotone.
- *Behavior*—Polygamous; males spar for dominance during fall rut.
- *Biology*—Breed in late September through mid-November. Polyestrous; gestation 227-229 days. Calves born mid-May through mid-June; 90% of young born during a 10-day period. Times of breeding and parturition vary among herds, but are quite consistent within a herd. Single calves born annually.

Development (Kelsall, 1968; Skoog, 1968)—Calves are precocial, able to walk within 1 hour of birth. Calves usually weigh 5-7 kg at birth; double weight within 10 days. Calf size and juvenile growth and weight reflect maternal winter nutrition and levels of parasitism. Both sexes antlered; antler growth begins during first summer. Antlers shed and regrown annually.

Growth (Kelsall, 1968; Skoog, 1968)—Most growth during summer. Strong sexual dimorphism: females reach adult size in three years and average 100 kg; males reach adult size in four years and average 190 kg. Growth influenced by nutrition and parasitism. Lifespan 10-12 years.

Movements (Kelsall, 1968; Skoog, 1968; Hemming, 1971)—Spring and fall migrations follow complex traditional routes. Spring migration is to traditional calving grounds. Fall migration is usually from upper latitudinal or altitudinal limit of summer range to wintering grounds in forest-tundra ecotone, but herds occasionally winter on summer ranges. Summer movements dictated by insect harassment and forage quality; local movements in summer to sites of insect relief (snowbeds, ridges, delta and coastal areas). Spring movement segregated by sex; females move northward or to higher altitude to calving grounds in advance of males. Fall migration not as strongly segregated.

Factors Influencing Populations

Natural (Skoog, 1968; Bergerud, 1978)—Predation by wolves, brown bears, Canada lynx (*Lynx canadensis*), and golden eagles. Diseases include brucellosis and rabies. Inclement weather can cause calf mortality in summer. Winter starvation can result from deep snow or severe icing.

Human-related (Bergerud, 1978; Klein, 1980)—Subsistence and sport hunting have been a major cause of localized caribou mortality, particularly since the introduction of modern rifles and snowmobiles into Native culture.

Potential (Klein, 1980; Cameron, Whitten, and Smith, 1983)—Increased development associated with natural resource extraction, e.g., oil field development, may result in obstruction of traditional migration routes, subdivision and decreased carrying capacity of caribou ranges, and subsequent herd declines. Winter seismic exploration may scatter caribou herds and increase energy expenditures by caribou. Disturbance on calving grounds may result in calf abandonment during critical maternal-bonding periods. Increased access to remote areas might result in increased harvest of caribou by hunters. Reindeer herding conflicts with caribou due to competition for rangelands. Reindeer joining caribou herds could result in increased pressure by reindeer herders to exclude caribou from grazing allotments; genetic mixing between reindeer and caribou could prove detrimental to caribou gene pools.

Population Size (Bergerud, 1978; Seward, 1985)

At present, 501,000 caribou (minimum estimate) in Alaska. Population estimates (1985) for individual herds: Alaska Peninsula herd—(north) 20,000, (south) 10,000; western arctic herd—212,000; Teshekpuk Lake herd—11,000; central arctic herd—13,000; and Porcupine herd—148,000. Numbers highest after summer calving. Herd sizes may fluctuate dramatically due to predation, hunting pressure, and emigration.

Management

Hunting season from July 1 to April 30, subject to local regulations and bag limits. Calving area of western arctic herd recognized as ecologically sensitive area by Naval Petroleum Reserve Production Act (1976). In 1983, Bureau of Land Management (BLM), U.S. Department of the Interior, discontinued oil and gas leasing in this area. BLM also restricts surface and aerial activity in calving area between May 15 and July 15. Porcupine herd rangelands protected under Alaska National Interest Lands Conservation Act (1980), which restricts mineral and petroleum exploration in areas used by caribou during calving and postcalving.

Persons Consulted

J. L. Davis, Alaska Department of Fish & Game, Fairbanks, Alaska.
D. R. Klein, Alaska Cooperative Wildlife Research Unit, University of Alaska, Fairbanks, Alaska.
F. L. Mauer, Arctic Wildlife Refuge, U.S. Fish & Wildlife Service, Fairbanks, Alaska.
K. R. Whitten, Alaska Department of Fish & Game, Fairbanks, Alaska.

PEGGY J. KUROPAT
Alaska Cooperative Wildlife Research Unit, University of Alaska, Fairbanks, Alaska.

Legend

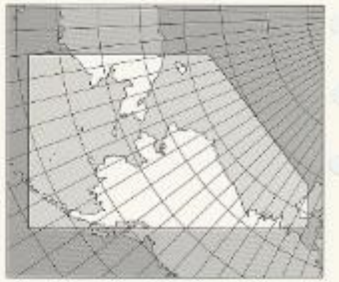
- Adult Area (Year-round)
- Adult Area (October-March)
- Adult Area (April-September)
- Occasional Occurrence (October-March)
- Calving Grounds (May-June)
- Major Adult Concentration (July-August) Insect relief
- Designated Herd Area

Mating occurs September-November throughout adult areas. Calving areas are also major adult areas during calving season. Herd areas are defined by calving grounds; herds may intermix when not calving. Central arctic and western arctic herds intermix October-March; boundaries for these herds in interior Alaska cannot be depicted. Juveniles occur throughout adult areas. Movements usually follow complex traditional migratory routes and often occur in groups segregated by sex.

Estimated populations for herds are: (1) western arctic herd, 212,000; (2) Teshekpuk Lake herd (nonmigratory), 12,000; (3) central arctic herd, 13,000; (4) Porcupine herd, 148,000; (5) southern Alaska Peninsula herd, 10,000; (6) northern Alaska Peninsula herd, 20,000. Andreafsky herd (north of Norton Sound and Yukon Delta, not shown) has very few animals, primarily feral reindeer.

Map References

Hemming, 1971; Cameron, Whitten, and Smith, 1983; Valkenburg, Davis, and Kantzenzerzyk, 1983. Personal communications from Davis; Whitten.



Arctic Explorer

Description

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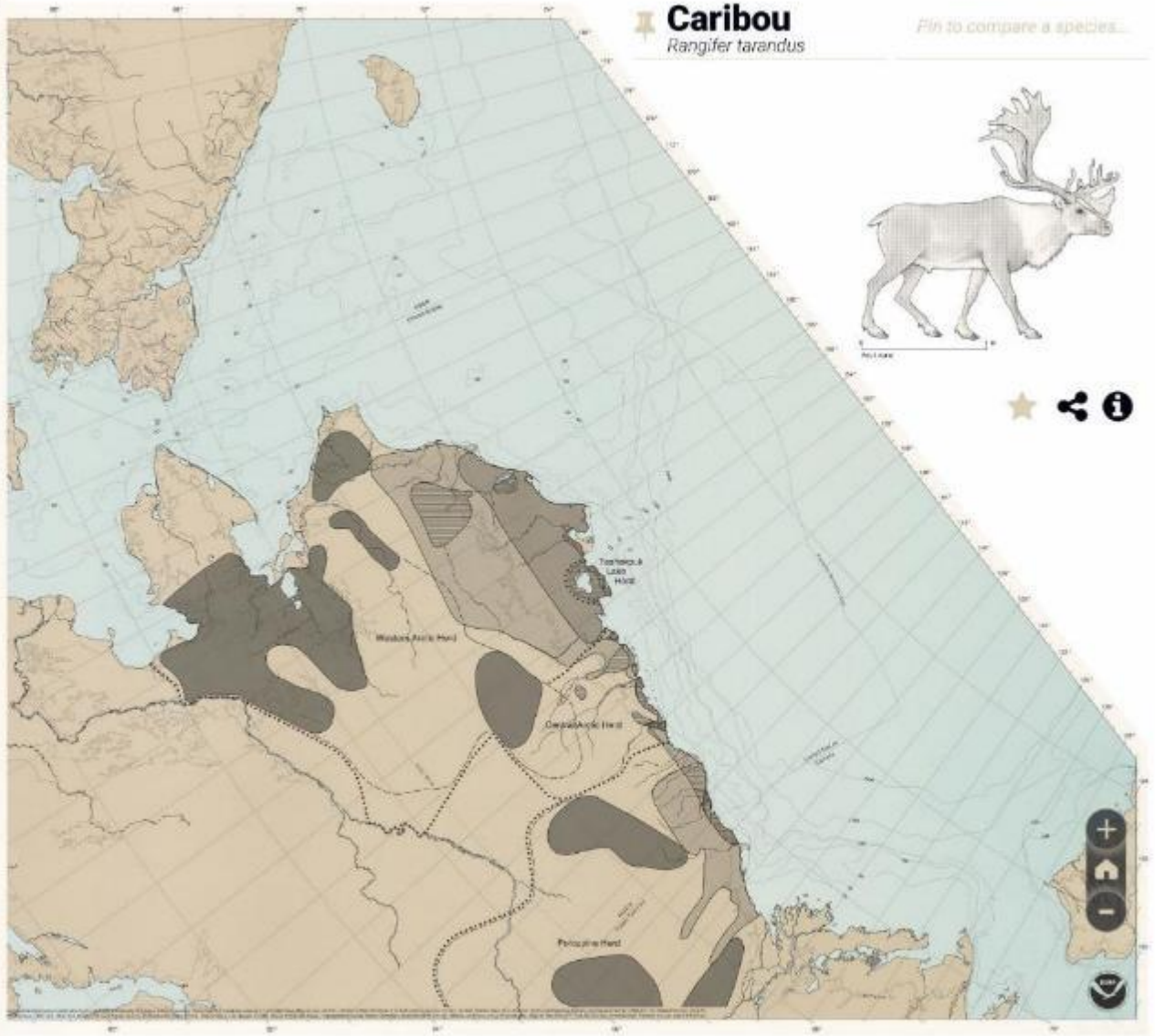
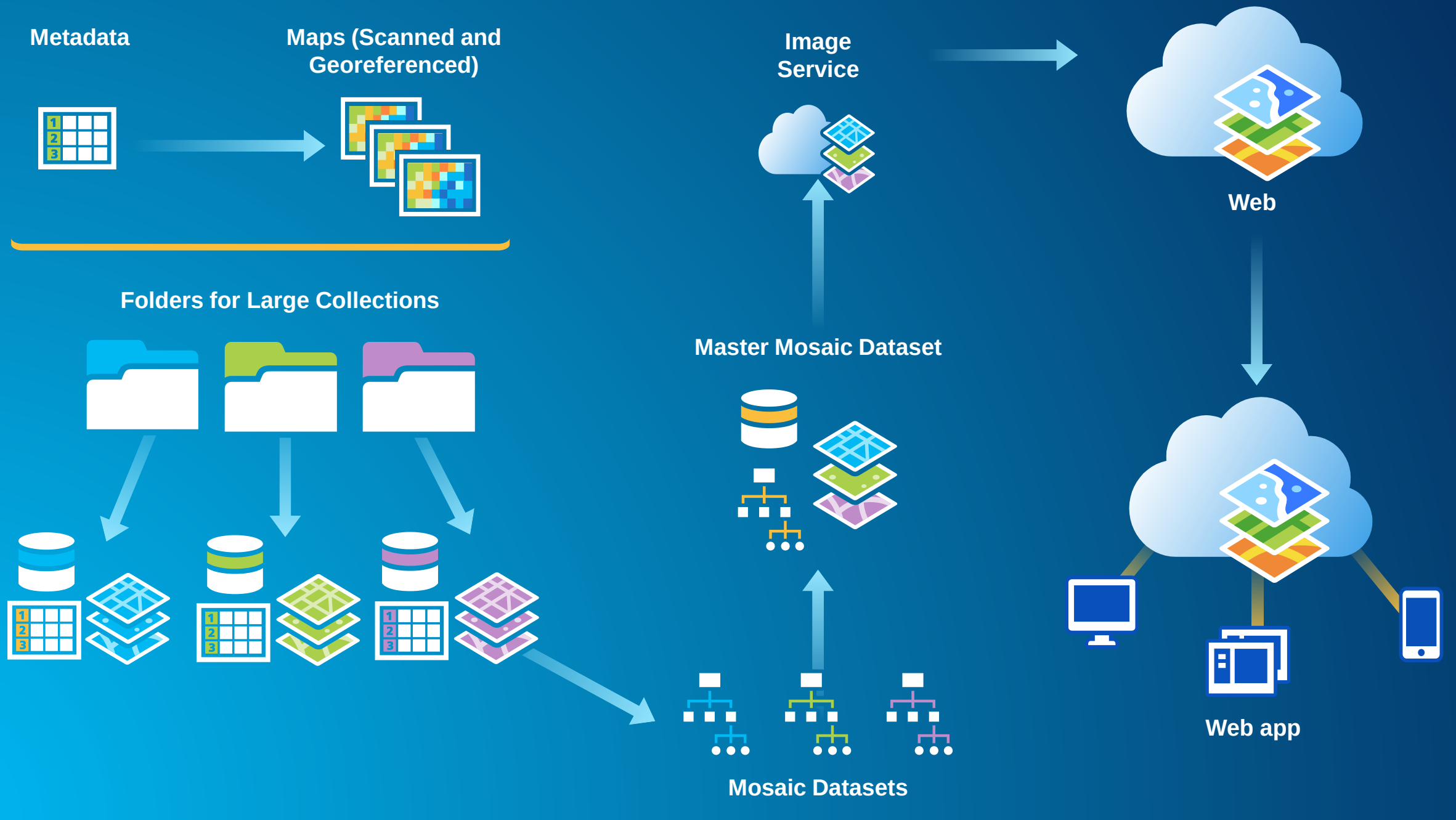


Browse wildlife by...

Chapter

1 2 3 4 5

Workflow


Metadata
Maps (Scanned and Georeferenced)
Folders for Large Collections
Image Service
Master Mosaic Dataset
Mosaic Datasets
Web
Web app

Metadata

Metadata Content

- **Information about:**
  - the map
  - the control points used to georeference the map

- **Metadata is used:**
  - to define the map extent (inside the collar)
  - to create the mosaic dataset
  - in the web map app

Creating the Metadata

- Inventory the maps
- (Scan and georeferenced the maps)
- Collect the required and desired information
- Compile the info in Excel format

Metadata

Field Name	Description	Excel cell format	Examples
Scan_Id	A unique integer for identification of a single scanned map image.	Text	1; 290234
Folder_Name	The name of the subfolder in which the file is located. The files might be in several subfolders for ease of data management.	Text	Yosemite; California
File_Name	The name of the scanned map image file. The file name should identify the name of the map, the year on the map, the scale of the map, and, if necessary, the version of the map. Maps with the same name, year, and scale can be differentiated by appending a hyphenated number suffix. The suffix determines the order of display—scanned map images with smaller numbers will be displayed on top of images with larger numbers. For example: Yosemite National Park and Vicinity_CA_1969_125000-1.tif and Yosemite National Park and Vicinity_CA_1969_125000-2.tif are version of what appear to be the same map. Use the following naming convention: name_date_scale-version. For example, for Yosemite National Park and Vicinity_CA_1969_125000-1.tif, where: ▪ Yosemite National Park and Vicinity_CA is the name of the map. ▪ 1969 is the year on the map. ▪ 125000 is the scale of the map. ▪ -1 is the version of the map.	Text	Yosemite National Park and Vicinity_CA_1964_125000-1.tif
Name_on_Map	The name printed on the map.	Text	Yosemite National Park and Vicinity; Yosemite National Park
Year_on_Map	The four digit year that the map was created or released.	Number 0 decimal places	1969
[illegible]	[illegible]	[illegible]	1969

Metadata

Field Name	Description	Excel cell format	Examples
Year_on_Map	The four digit year that the map was created or released.	Number 0 decimal places	1969
Year_Printed	The four digit year that the map was printed.	Number 0 decimal places	1969
Year_to_Display	The date to use for displaying the map in YYYY-MM format. This is a combination of the year on the map and the hyphenated suffix in the file name, if there is one.	Text	1969-02
Map_Scale	The scale of the map in representative fraction form.	Number 0 decimal places	2400; 24000; 125000
Projection	The projection used for the map.	Text	Polyconic; Lambert Conformal Conic
Datum	A datum used for the map.	Text	NAD27; NAD83; WGS84
N_Lat_DMS	The latitude of the northern neatline with spaces separating the degrees, minutes, and seconds.	Text	37 45 10
S_Lat_DMS	The latitude of the southern neatline with spaces separating the degrees, minutes, and seconds.	Text	37 43 50
W_Long_DMS	The longitude of the western neatline with spaces separating the degrees, minutes, and seconds.	Text	-119 34 00
E_Long_DMS	The longitude of the western neatline with spaces separating the degrees, minutes, and seconds.	Text	-119 32 50
N_Lat	The latitude of the northern neatline in decimal degrees.	Number 7 decimal places	37.7527778 Can be calculated from DMS values, as

Metadata

Field Name	Description	Excel cell format	Examples
N_Lat	The latitude of the northern neatline in decimal degrees.	Number 7 decimal places	37.7527778 Can be calculated from DMS values, as described below.
S_Lat	The latitude of the southern neatline in decimal degrees.	Number 7 decimal places	37.7305556
W_Long	The longitude of the western neatline in decimal degrees.	Number 7 decimal places	-119.5666667
E_Long	The longitude of the eastern neatline in decimal degrees.	Number 7 decimal places	-119.5472222
Central_Long	The longitude of the central meridian of the map in decimal degrees. This can be calculated from eastern and western	Number 7 decimal places	-119.5569445
Scan_Resolution	The scan resolution in pixels per inch (PPI).	Number 0 decimal places	600
Control_Mark_Spacing	The grid spacing of the control marks. Only fill this in if the control mark spacing is the same in latitude and longitude.	Number 7 decimal places	0.0027778; 0.25
Grid_Layout_Lat_Long	The number of rows and columns of control marks on map when viewed in normal (north at the top) orientation. Format this as the number of rows first by the number of columns.	Text	4x4 (a square map in latitude and longitude); 9x8 (9 rows in latitude, 8 columns in longitude)
Notes	Explanatory information about the map.	Text	Shaded Relief
Citation	A citation for use in the web map application to describe the map.	Text	Yosemite National Park [map], 1948, 1:125,000

Metadata

Field Name	Description	Excel cell format	Examples
Citation	A citation for use in the web map application to describe the map.	Text	Yosemite National Park [map], 1948, 1:125,000 Topographic Map. Published by U.S. Geological Survey in cooperation with National Park Service.

Scanning

Scanning

Converting The Paper Maps
To Digital Format

In-house or Contracting Considerations

- Range of options and services needed
- Technical infrastructure required
- Technology refresh
- Need for fixed cost per item to be digitized
- Capability to handle volume and specific processing steps
- Staff availability and staffing costs
- Acceptance of risk

All considerations are especially true for scanning maps

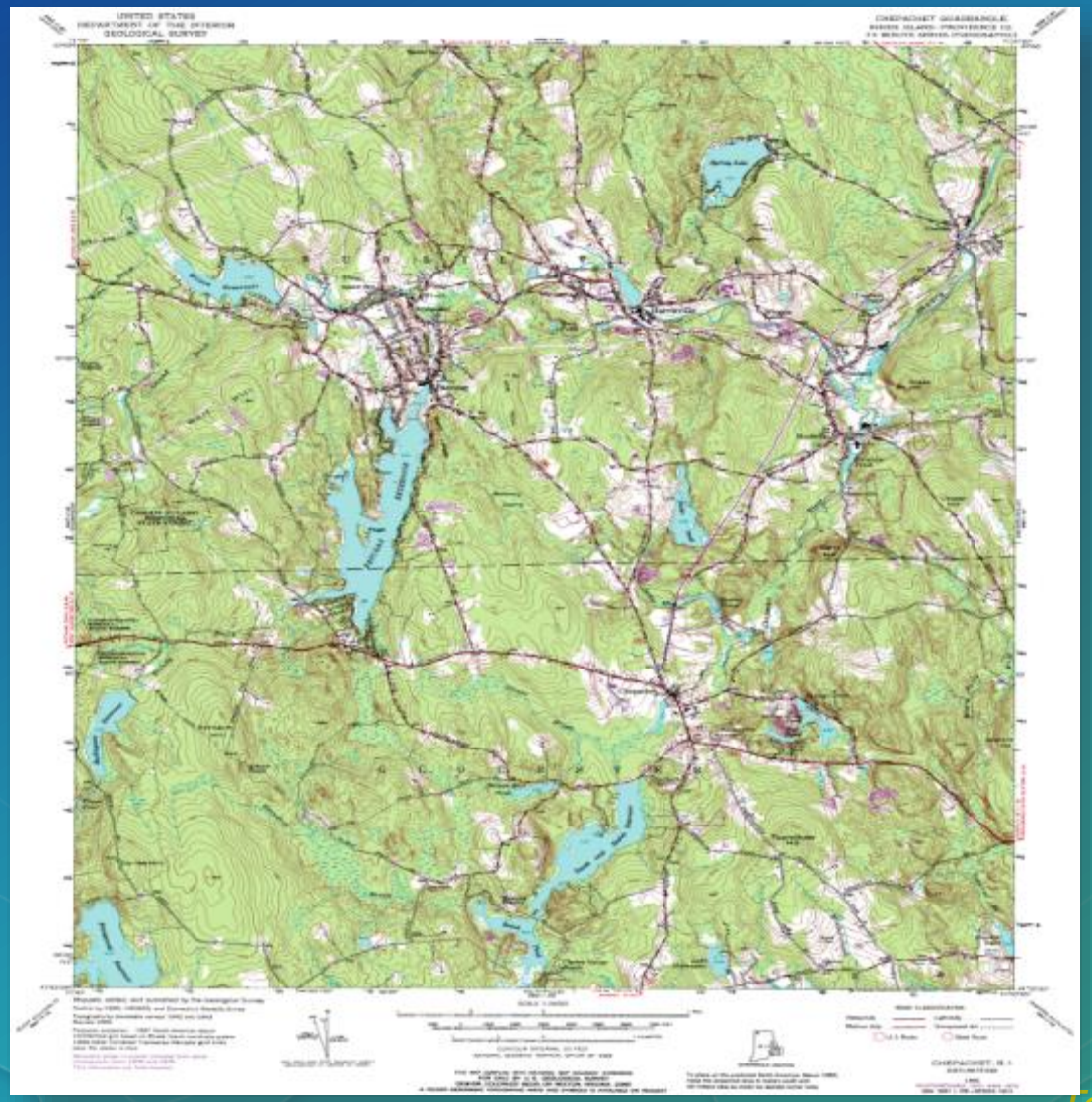
Scanning Recommendations

- Scan resolution 400 to **600** PPI
- 24-bit for color, 8-bit for monochromatic
- Untiled .tif format
- Uncompressed, or LZW or JPEG (for ArcGIS)
- Scan “as is” without restoration
- No color tints or lightening of the image
- Include map collar

Greg Allord, Esri Contractor; Peter Becker, Esri

Map Sheet

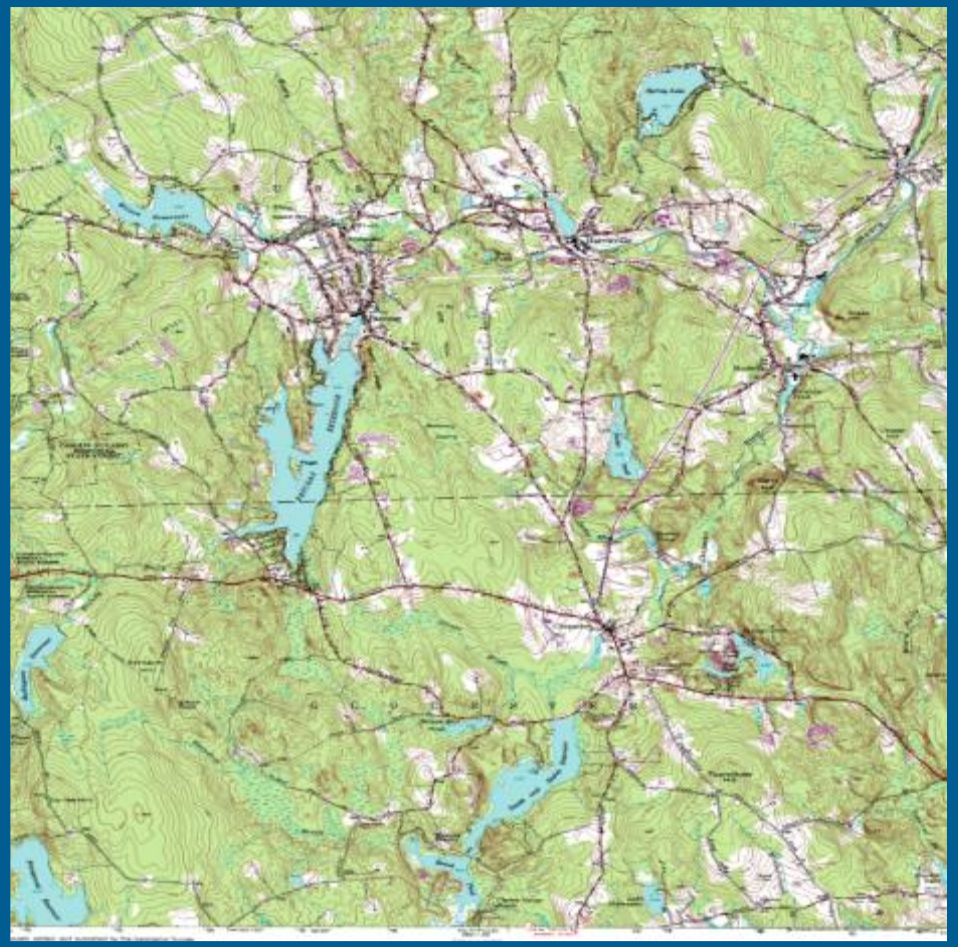
- The original paper map



Text

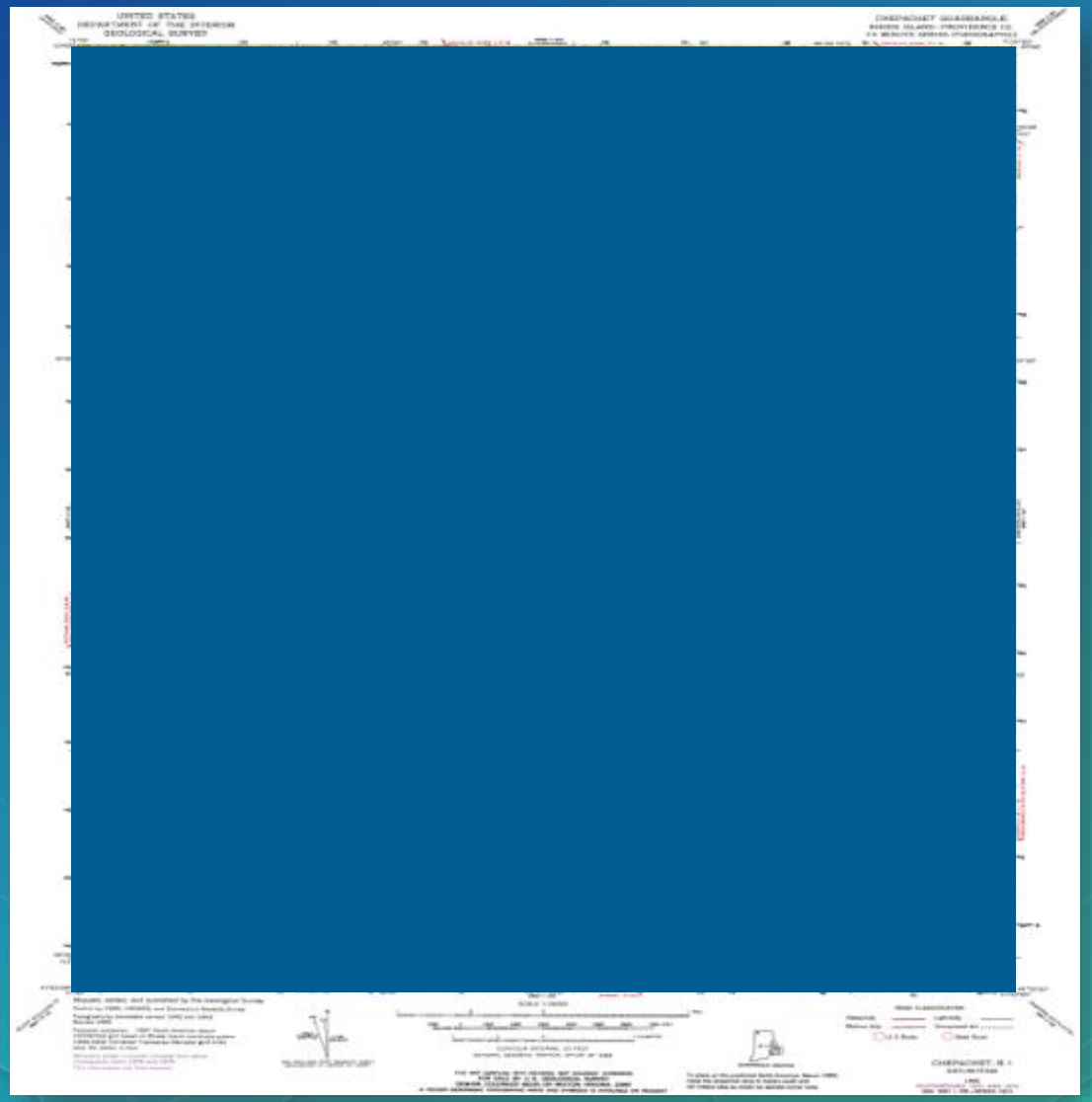
Map Extent

- What you want to see in the web app



Neatline

- What you (normally) want hidden



Georeferencing

Georeferencing

Aligning The Data To
The Real World

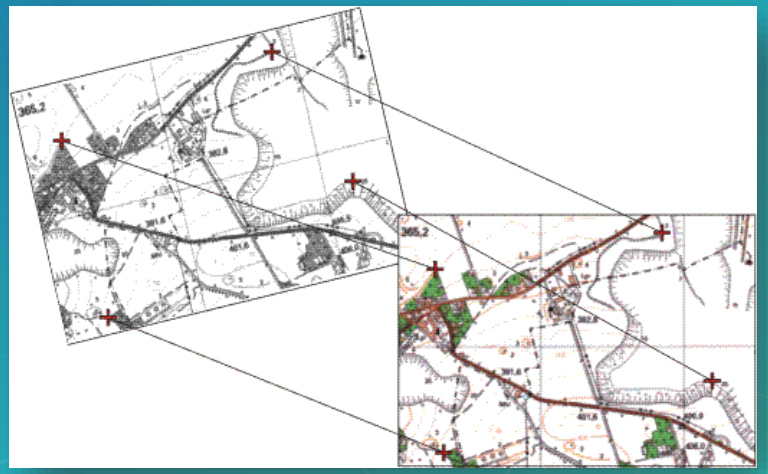
ArcMap
QUAD-G
Thematic-G

Georeferencing the Maps

“Aligning geographic data to a known coordinate system so it can be viewed, queried, and analyzed with other geographic data.

Georeferencing may involve shifting, rotating, scaling, skewing, and in some cases warping, rubber sheeting, or orthorectifying the data.”

- **Maps that are good candidates for georeferencing:**
  - **Are constructed on a known projection**
  - **Have a graticule consistently scaled over the entire map**



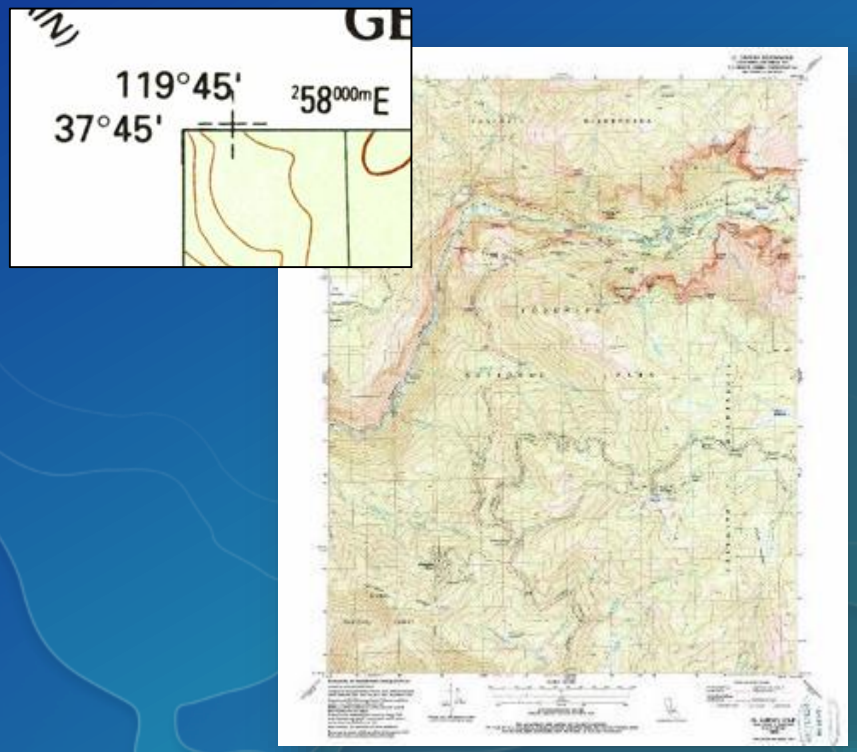
Georeferencing definition from Esri GIS Dictionary

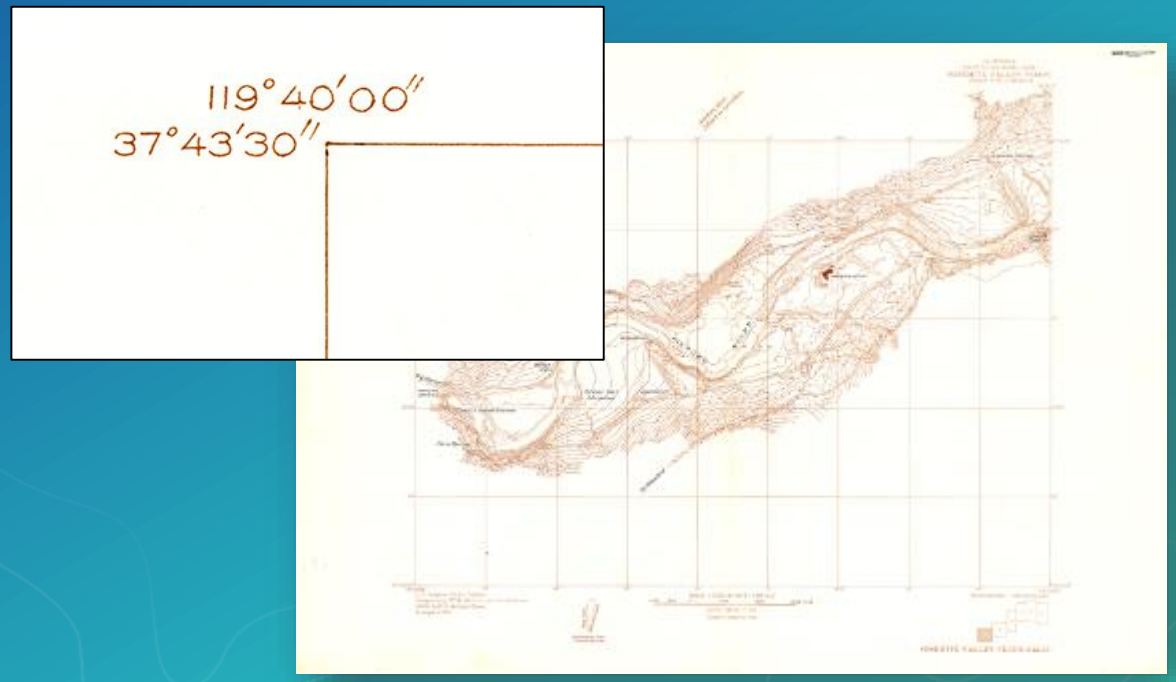
Control Points

- A. Full control
- B. Partial control
- C. No control

A. Full Control

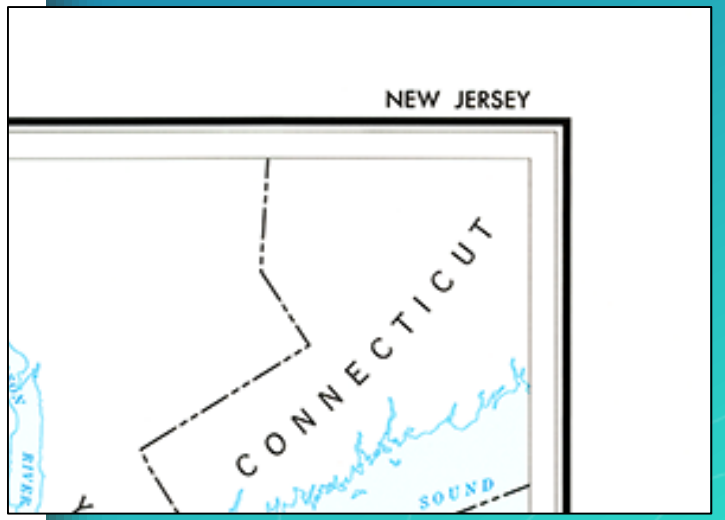
- Full grid from corner to corner and uniform distribution of control points
- Example: Quadrangle maps





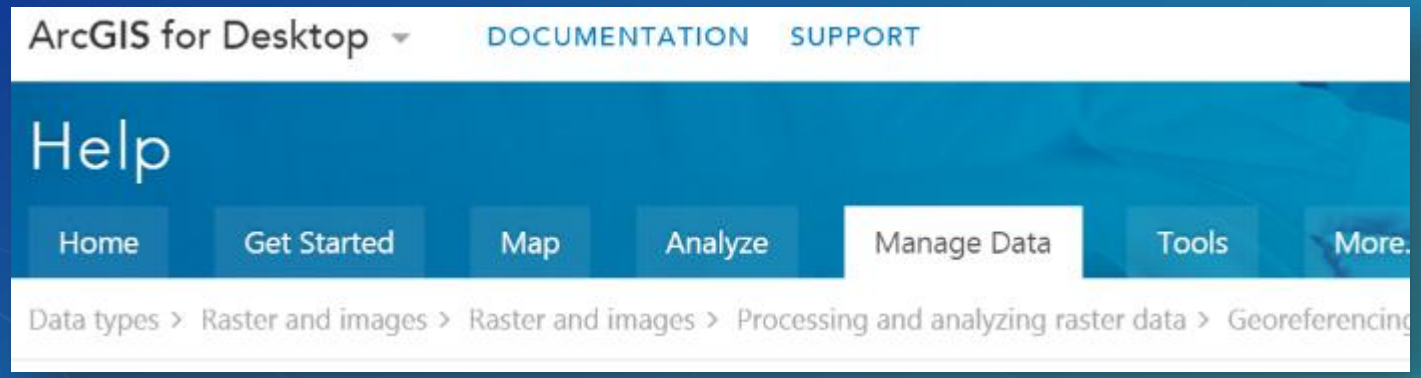
B. Partial Control

- Maps with control points, generally a grid but map corners are not labelled coordinates
- Examples: Thematic maps and reference maps, such as country, state, or county maps with irregular extents



C. No Control

- **Maps without control points**
- **Files be georeferenced in ArcGIS**



- **“Fundamentals of georeferencing a raster dataset”**

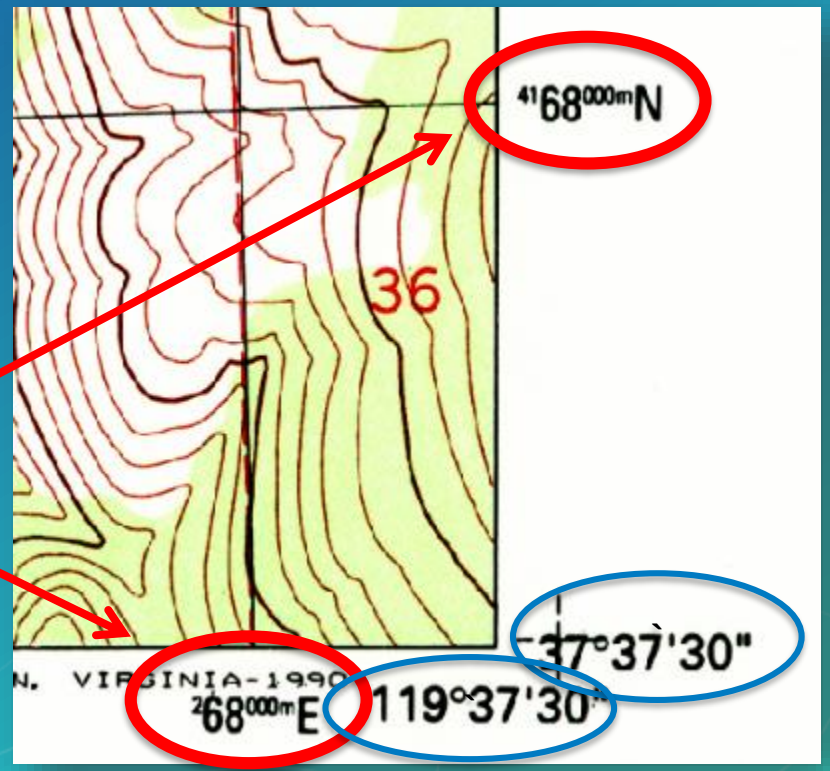
http://desktop.arcgis.com/en/desktop/latest/manage-data/raster-and-images/fundamentals-for-georeferencing-a-raster-dataset.htm

Define the Correct Projection and Datum

- Check the coordinate system (datum) in which the map was printed
- Not the projection of the neatline
- Georeference in map's coordinate system
- Maps are not printed in geographic coordinates!
- Lines of longitude and latitude are not straight!

Projection and 10,000-foot grid ticks: California coordinate system, zone 3 (Lambert conformal conic)
1000-meter Universal Transverse Mercator grid, zone 11
1927 North American Datum

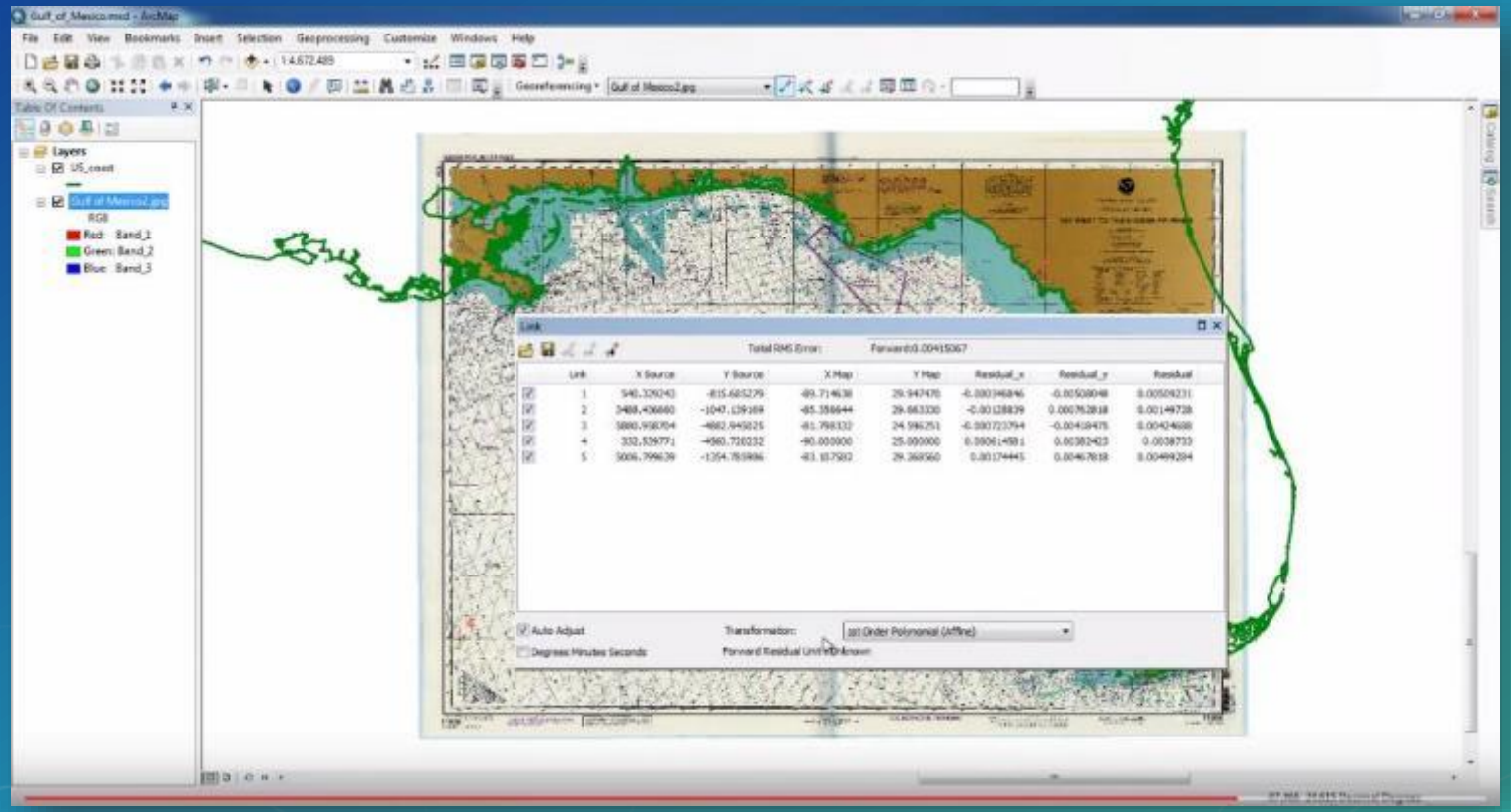
Map was printed in NAD 1927
Corner control points are in geographic coordinates, but with the NAD 1927 datum



Text

Georeferencing with ArcGIS

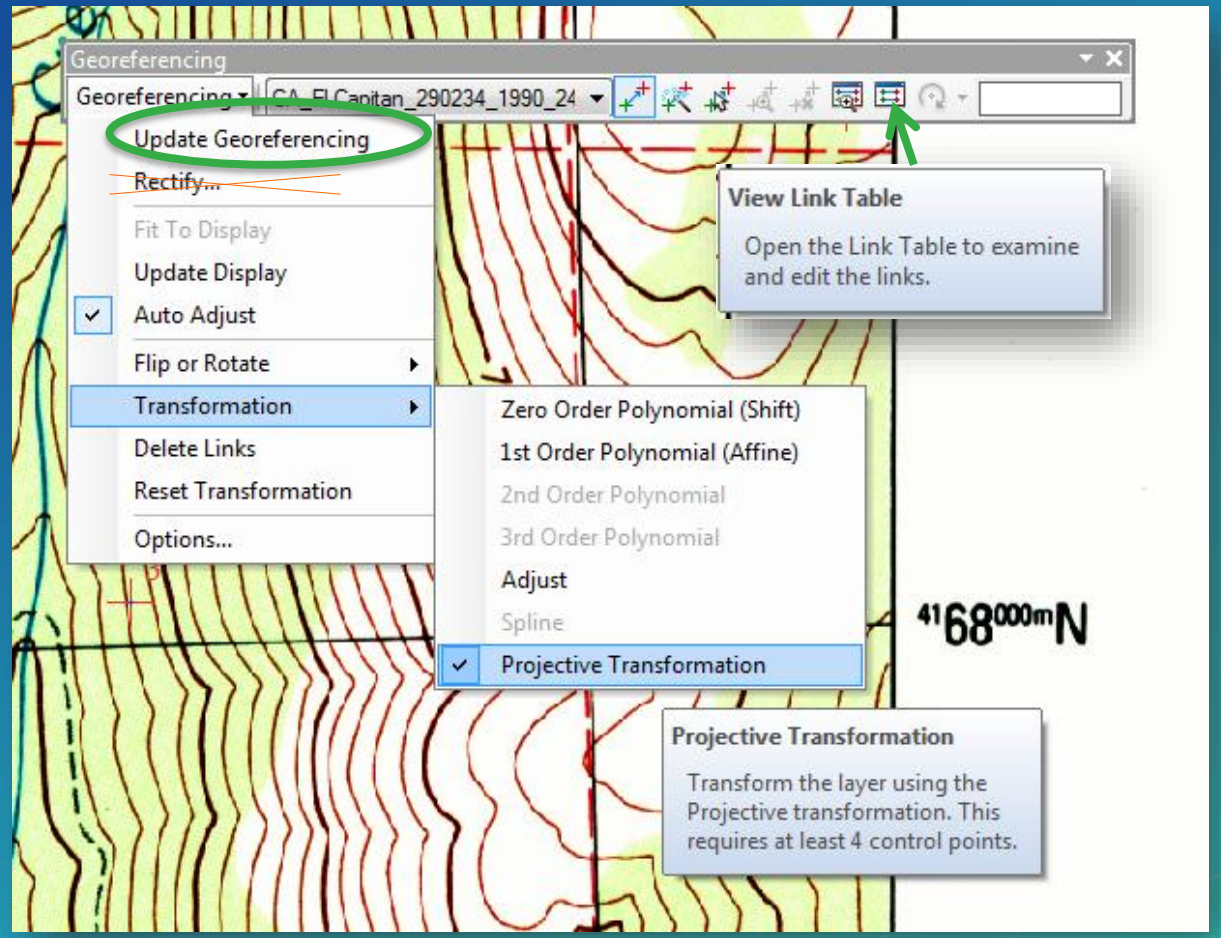
- Manually collect control points
- Use another image or a vector layer with known spatial reference
- Use Update Georeferencing
- Do not use Rectify - rectifying the map will reduce quality!



YouTube: Georeferencing in ArcMap Tutorial

Georeferencing Recommendations

- Set Files to Read Only, otherwise ArcMap/Pro will update them
- Use Update Georeferencing
  - Will create *file*.AUX.XML
  - Defines:
    - Image and ground coordinates
    - Transformation type
    - Projection information
  - Can always improve later
- Do not use Rectify!
- Optimization (faster but may not be as accurate)
  - Use corner control points (in the map's datum)
  - Check residuals using 1st Order (affine) transformation
  - Set to Projective Transformation



Mosaic Dataset

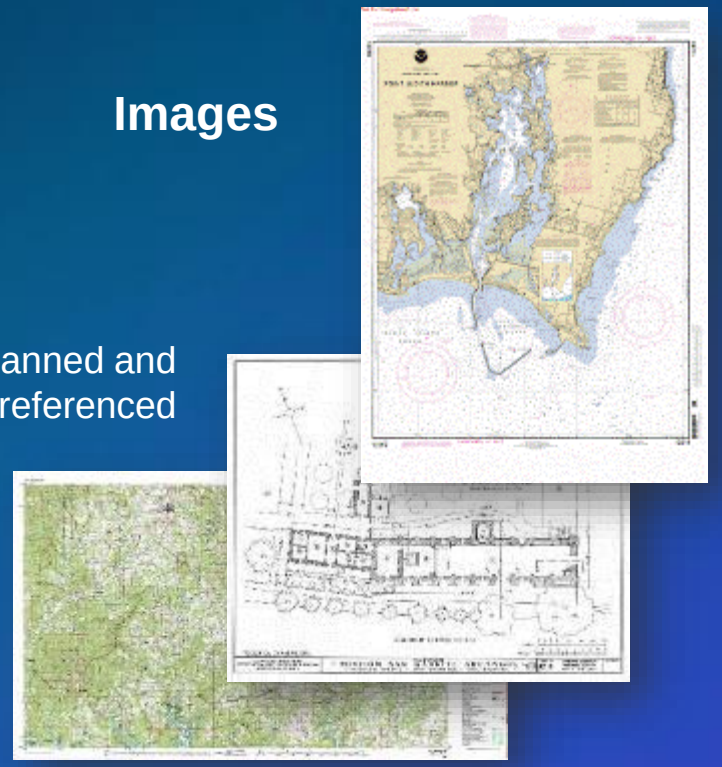
Mosaic Dataset

Managing the Image Data In ArcGIS

Metadata Table

For Data Management and Web App

Images



Scanned and Georeferenced

Sharing with Others

Functionality

Create Mosaic Dataset → Add Rasters → Set Properties → Evaluate → Create Image Service

Mosaic Dataset

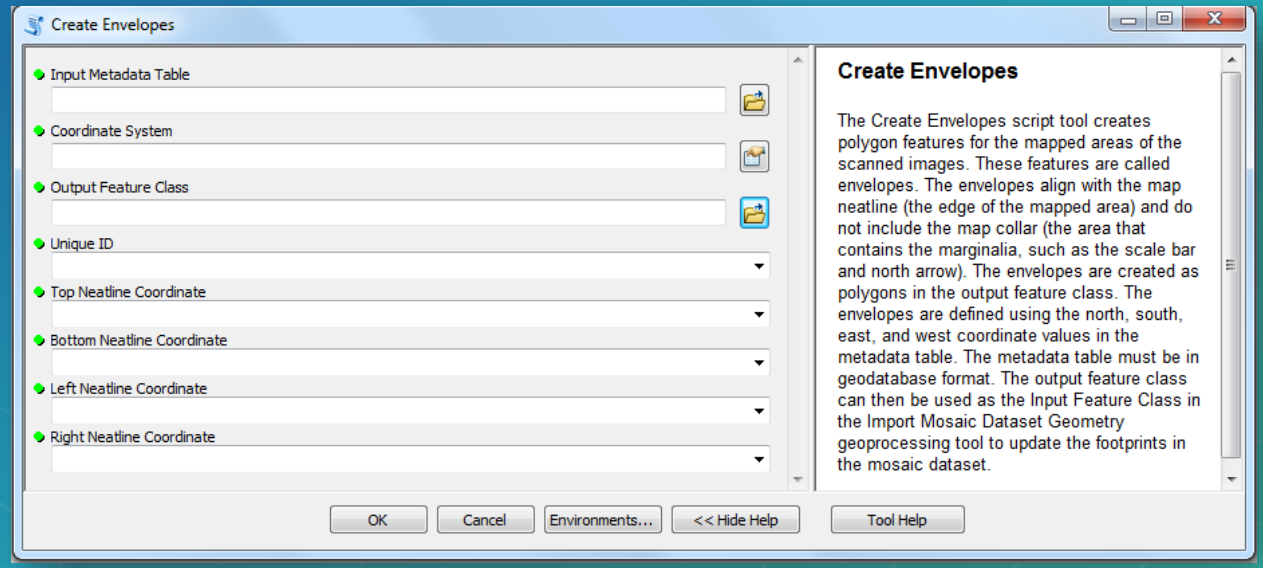
- Geodatabase data model used to catalog, process, visualize, and share your collections of imagery (images, rasters, and lidar) data
- References the source data
  - Defines metadata
  - Defines processing (including projection, clipping enhancement)
- Provides dynamic mosaicking and on-the-fly processing
- Used as a catalog and as an image
- Can be shared as an image service

Optimum method to manage and serve online collections of imagery in ArcGIS

Creating features that match the extent of the neatlines (envelopes)

Create Envelopes script tool has been created for you

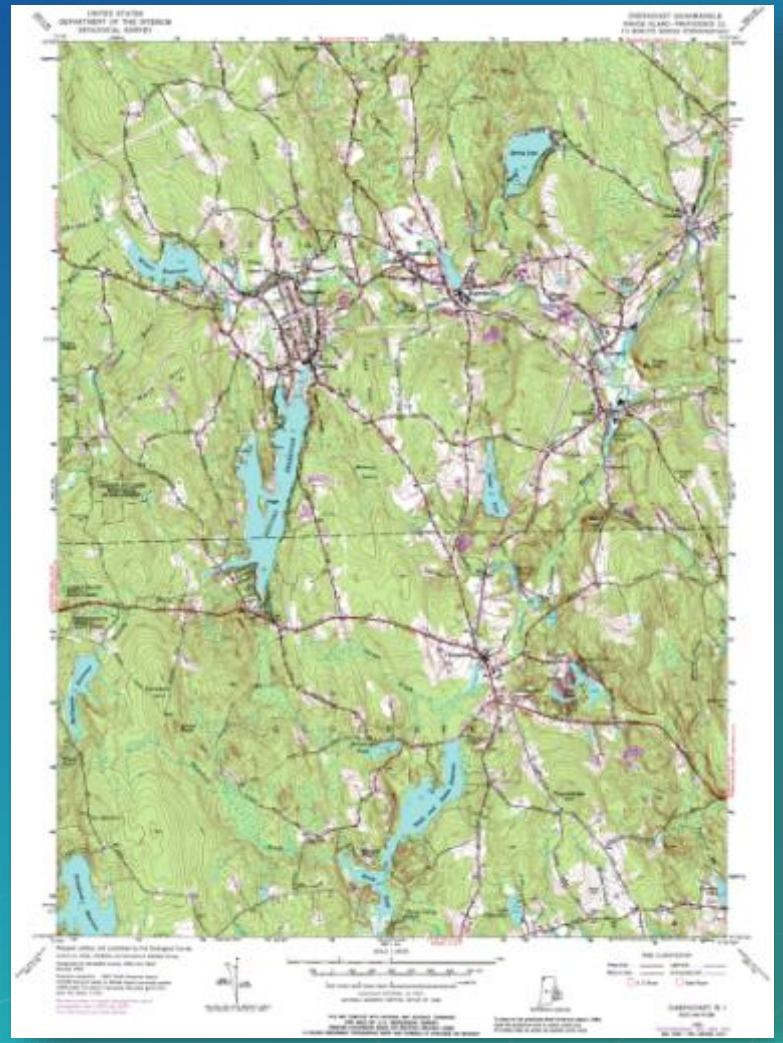
- Use the Create Envelopes script tool
- Set the coordinate system
- Specify which fields in the metadata table have:
  - North latitude, South latitude, West longitude, East longitude
- You can modify the envelopes to match the extent of the map on the page
  - Clip out legends, cartouches, etc…
- Append the metadata
- Add the Raster field – path to the rasters
- Convert the time field to date format



Steve Lambert and Aileen Buckley, Esri

Creating the Mosaic Dataset

- Create the mosaic dataset
  - Define the projection (of the mosaic dataset, not the maps)
- Add Rasters
  - Use Table raster type
  - Use the envelopes feature class as the data source
  - Includes the Raster field with the path to the rasters
- Update the footprint fields that control mosaicking
- Add attribute indexes
- Update the mosaic dataset properties
  - For display, for time, for the web map app



Defining the Order and Display of Rasters in the Mosaicked Image

Zorder, MaxPS, mosaicking method

- Display is contingent on map scale (how zoomed in your are)
- Mosaicking is controlled by:
  - Zorder – which rasters will be shown on top of others
  - MinPS and MaxPS – map scales at which the rasters will be shown
    - The raster displayed if the screen/request pixel size is between these values
    - You can set MinPS and MaxPS to any suitable value
  - Mosaic Method – there are many methods to order the rasters

- Mosaic Method is overridden by ZOrder. Lower ZOrder, higher priority
  - For example, calculate ZOrder = (Map_Scale *10000) – Start_Time
  - This results in larger scale and more recent maps being displayed first

Mosaic dataset properties

- Mensuration
  - Allow measurement
- Allowed Compression Methods
  - LZW as the default
- Allowed Mosaic Methods
  - Allow Lock Raster – lock the display to selected rasters
- Always Clip the Raster to its Footprint – Yes
  - Clip to the envelope extent
- Footprints May Contain NoData – No
  - You don’t want transparent pixels
- Time properties
- Geographic Coordinate System Transformation
  - Ensure the required transformation is defined

Image Service

Image Service

Getting The Data Into A
Web Friendly Format

- **Time-enabled**
- **Multi-scale**
- **With or Without Collar**
- **Unique ID for Web App**
- **Metadata for Web App**

Creating the Image Service

- Connect to the server
- Share the mosaic dataset as an image service
- Set the service properties
- Analyze the service
- Publish the service
- Open the REST URL

Under development!

Image Service

Web App

Web App

Providing a User Interface
And Interactivity

Support Multiple Devices

Immediately Deployable and Easily Configurable

Creating the feature service

- A configurable app has been created for you

- Download the code from GitHub
- Update the component values
- View the changes on your own machine
- Upload the code to a server
- View the app on the web

Note

Component values to update

- The browser window title which will be displayed in the web browser’s bookmark
  - "APP_TITLE": " USGS Historical Topographic Map Explorer "
- The application header text which displays at the upper left of the application window
  - "HEADER_TEXT": " USGS Historical Topographic Map Explorer "
- The header icon which displays at the upper right of the application window
  - "NON_ESRI_ICON_PATH": " images/usgswhite.green.jpg “
- The initial map view
    - "BASEMAP_INIT_LAT": 29.939833,
    - "BASEMAP_INIT_LNG": -90.076046,
    - "BASEMAP_INIT_ZOOM": 12

omponent values to update

- The map scales for the scanned map images in the image service
  - {
    "label": "250,000",
    "value": 250000,
    "color": "rgb(0, 78, 215)",
    "className": "five",
    "lodThreshold": 7
    },

    Note: Add or delate scales as they pertain to your project

omponent values to update

- The URL for the image service
  - "IMAGE_SERVER": "http://utility.arcgis.com/usrsvcs/servers/f0ccaa1db1e5457397d22847d66f7de1/rest/services/USA_Historical_Topo_Maps/ImageServer"
- The URL for the index map feature service
  - "QUERY_TASK_URL": "http://services.arcgis.com/YkVYBaX0zm7bsV3k/ArcGIS/rest/services/USGSTopoIndex/FeatureServer/0"
- The path to the downloadable files, if these are allowed
  - "DOWNLOAD_PATH": "http://ims.er.usgs.gov/gda_services/download?item_id="

Component values to update

- **Other components affect the:**
  - **Colors**
  - **Text**
  - **Size of areas on the page**
  - **Behaviors (for example, a navigation button can be added to the timeline)**

Wrap Up

Review of What Was Covered

- Introduction
- Project Planning
- Examples
- Workflow
  - Metadata
  - Scanning
  - Georeferencing
  - Mosaic Dataset
  - Image Service
  - Web App

Text

Resources

Resources

- Share the workflow with others, including…
  - Modifications for general applicability to a wider audience
  - Documentation, sample data, and metadata
  - Support
- …enabling others to build their own collections and bring their archives to life.

- Image management workflows
  - http://resources.arcgis.com/en/home/

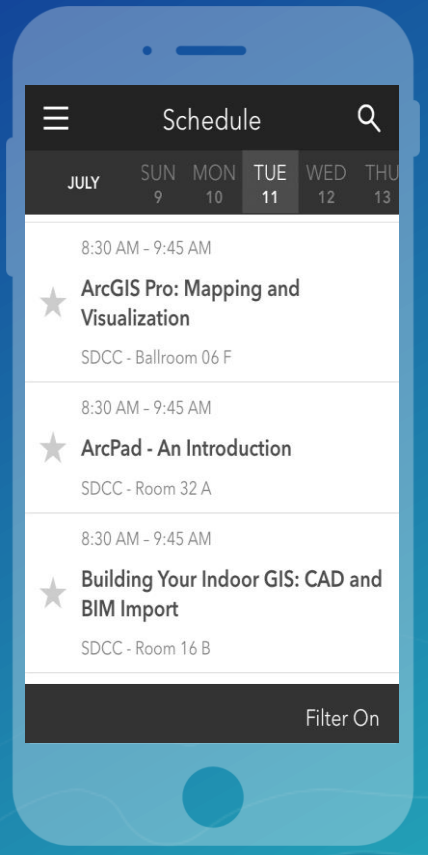
Resources

- **Documentation:**
  - **Project planning**
  - **Scanning**
  - **Georeferencing**
  - **Creating the mosaic dataset**
  - **Creating the image services**
  - **Creating the index map feature service**
  - **Configuring the web map app**
- **Sample Data**
- **Tools and toolbox**

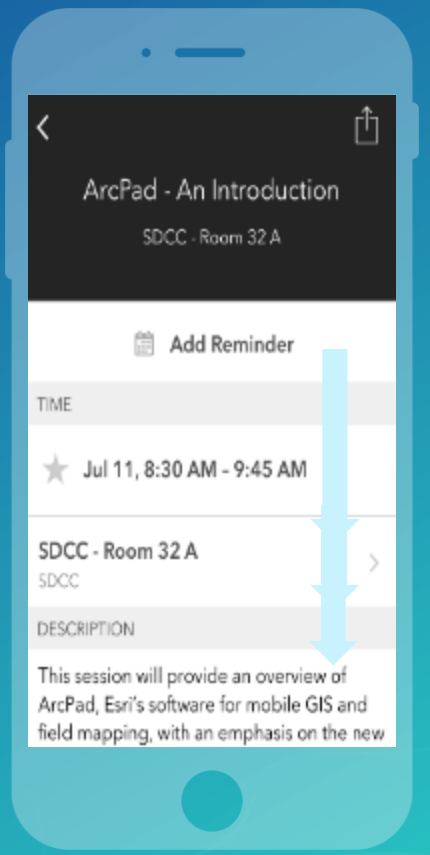
Please Take Our Survey on the **Esri Events App!**

Download the Esri Events app and find your event

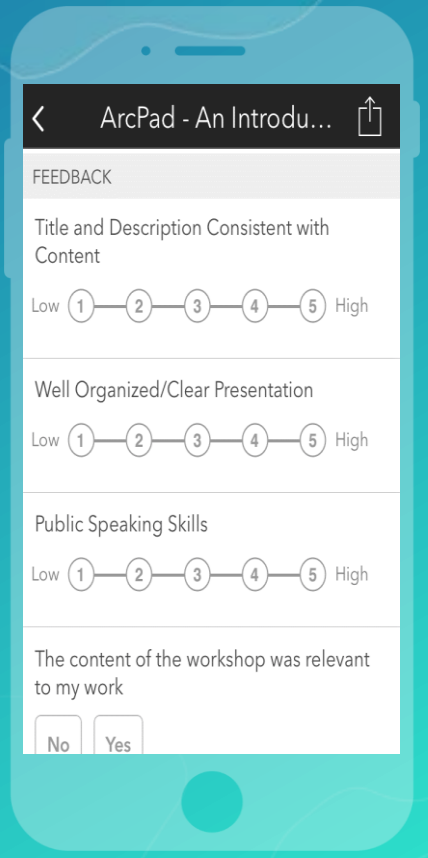
Select the session you attended



Scroll down to find the survey



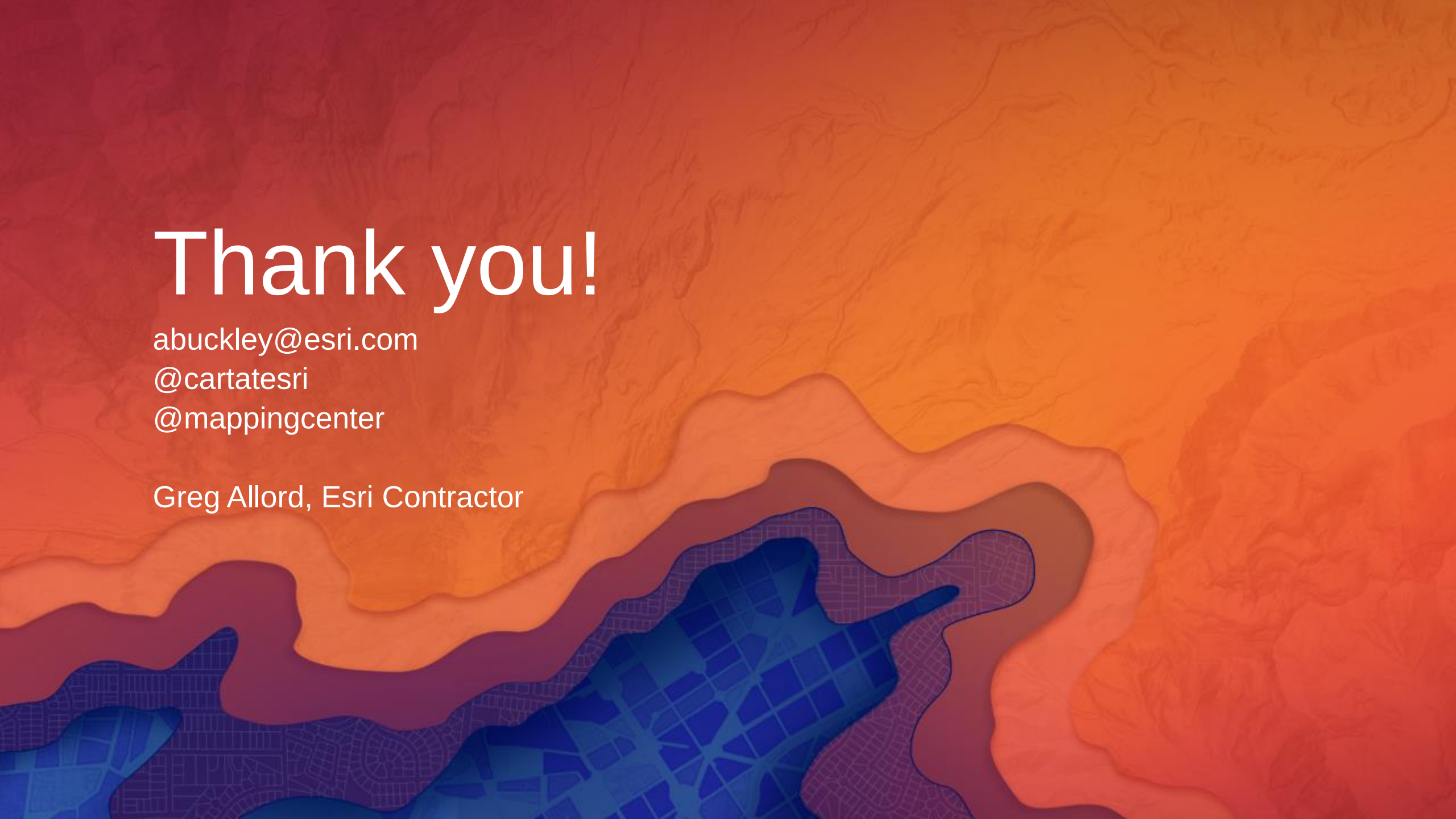
Complete Answers and Select "Submit"



Thank you!

abuckley@esri.com
@cartatesri
@mappingcenter

Greg Allord, Esri Contractor



esri
THE SCIENCE OF WHERE