

Project 1: Albertine Rift Pipeline Analysis

ENVIRON 761

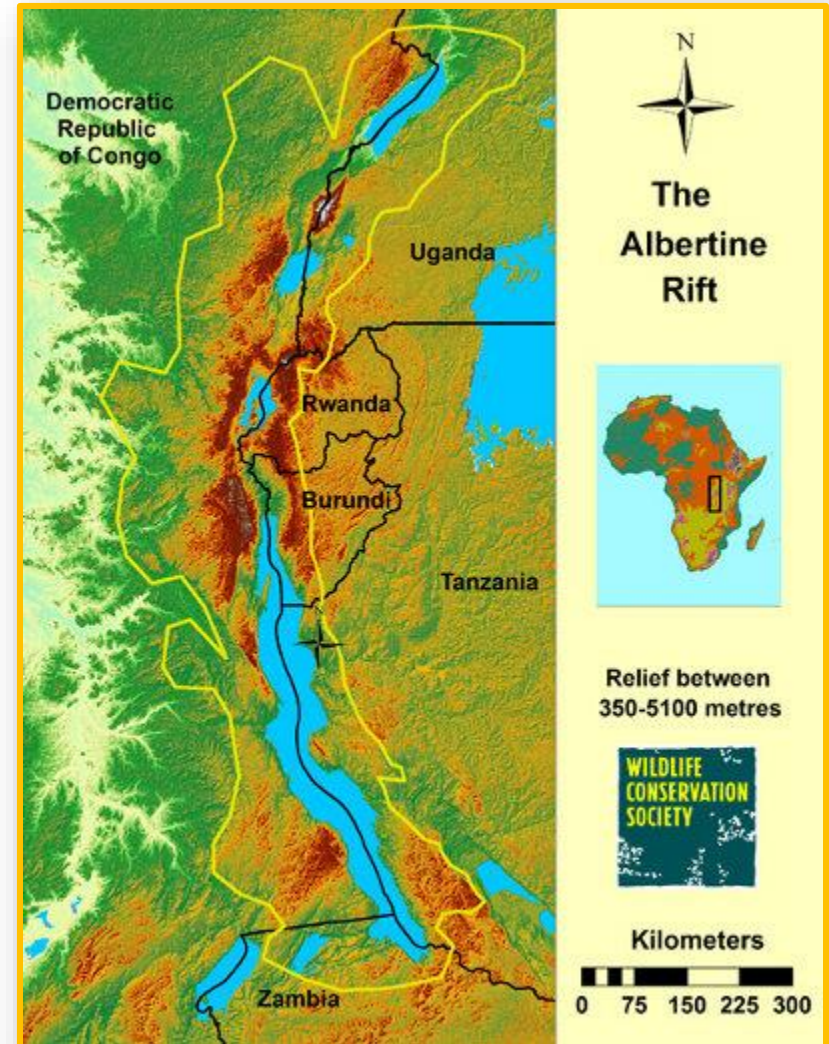
Geospatial Applications for
Conservation & Land Management

Section 1: Project-based GIS

Impact analysis of two proposed oil pipelines in the Albertine rift



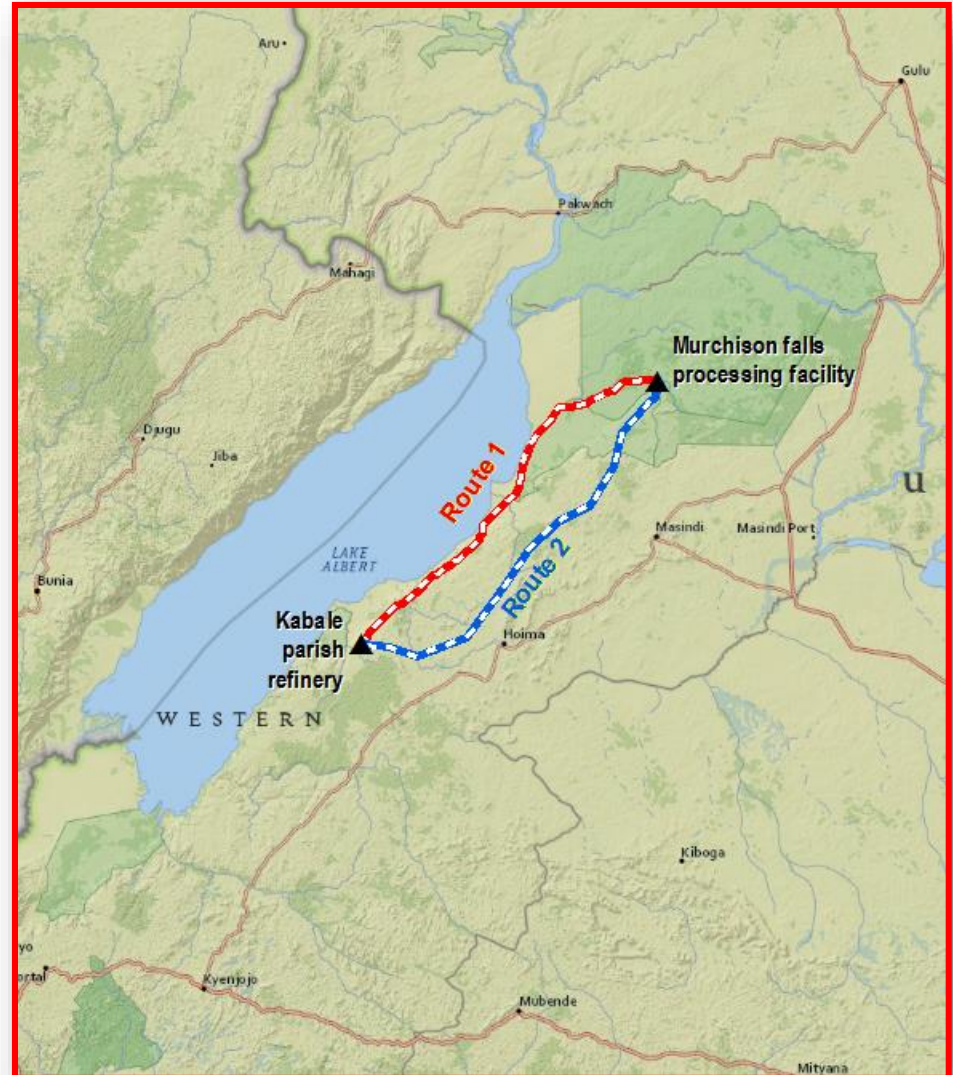
<http://www.albertinerift.org>



Albertine Rift Pipeline Project

Objective:

Evaluate the potential impacts of two proposed oil pipelines on people, wetlands, and ecologically sensitive areas...



Albertine Rift Pipeline Project

Clarified objectives:

For each route, estimate:

1. The number of people with 2.5km of the pipeline
2. The area of wetlands within 2.5km of the pipeline
3. The length of pipeline falling within a protected area

Albertine Rift Pipeline Project

Data needs:

- Proposed pipeline routes (provided, but poorly documented).
 - Population data
 - Wetland areas
 - Protected areas
- } *Need to find...*

Albertine Rift Pipeline Project

Analysis:

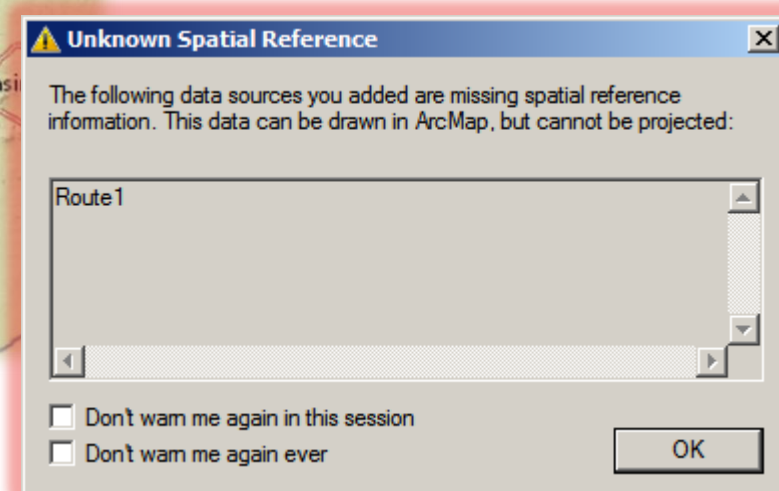
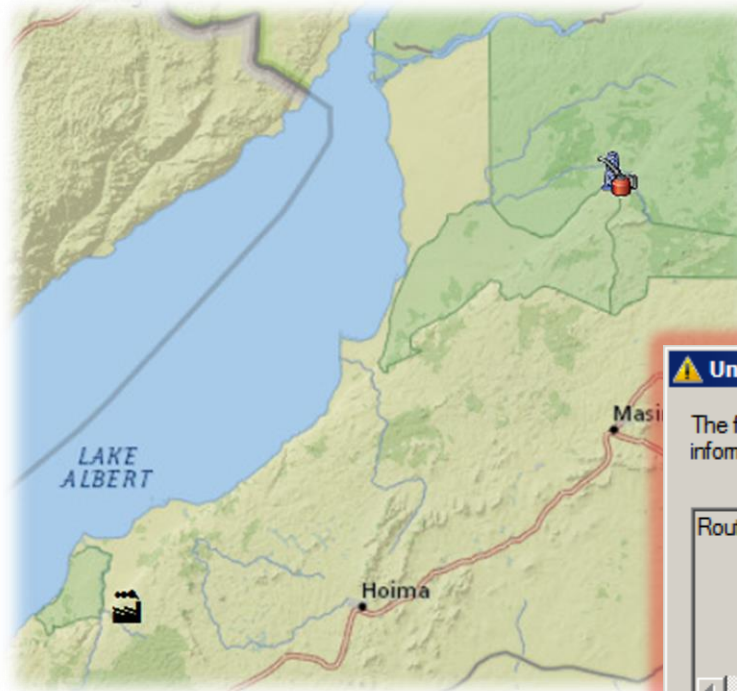
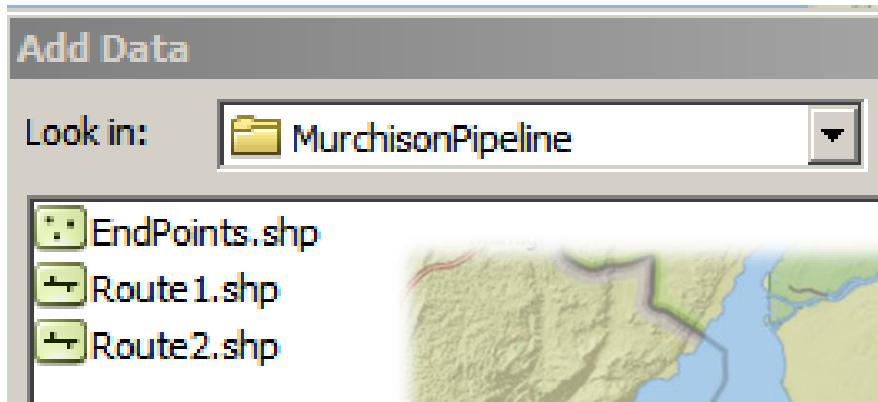
- Create a 2.5km buffer around each proposed route.
- Tabulate total number of people within buffer
- Tabulate total area of wetlands within buffer

- Clip route segments found within protected area
- Calculate total length of these segments

Plan of attack

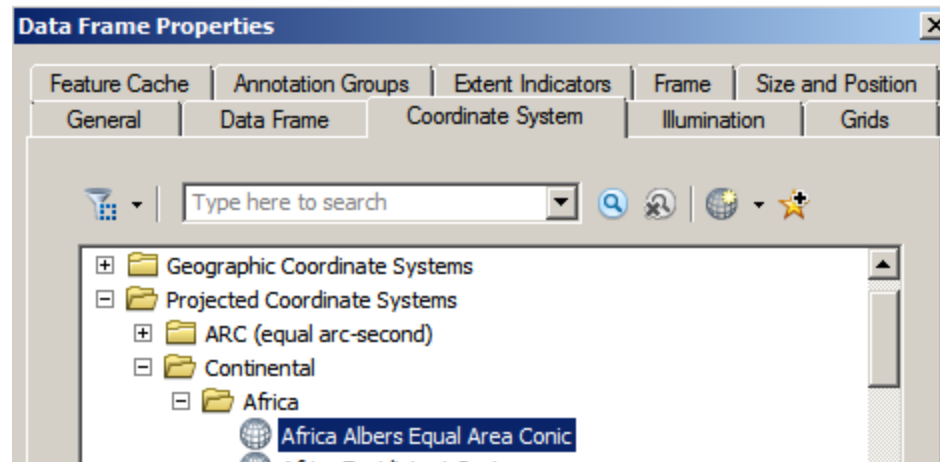
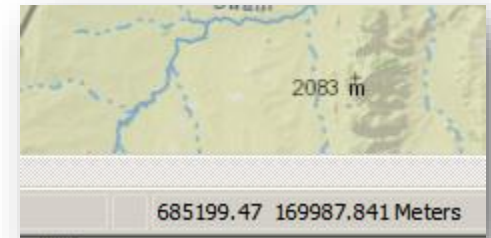
- Create a project workspace
- Prep the pipeline data
- Locate and prepare data:
 - Population
 - Wetlands
 - Protected areas
- Execute analysis
- Present results *by this Monday @ 11:55pm*

Prepare pipeline data (provided)

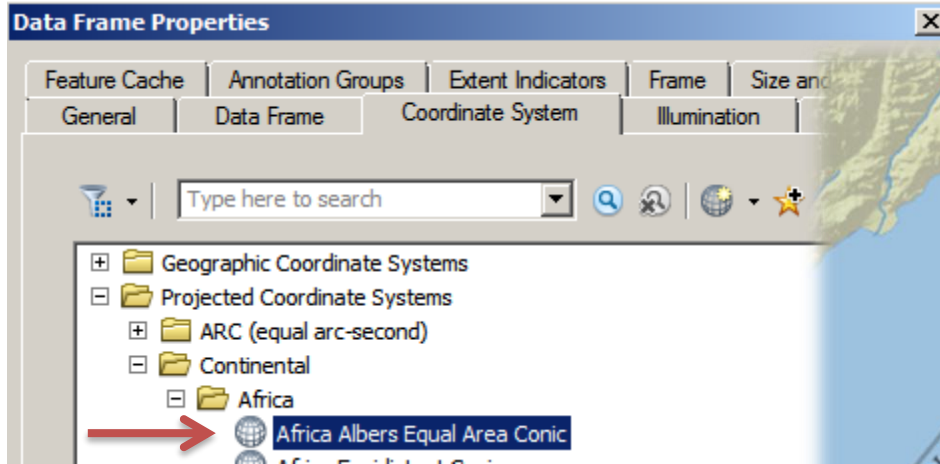


Guessing at projections

- Check metadata/documentation
- Geographic or projected?
 - zoom to layer & look at the coordinates
- Which projection?
 - Anything to narrow guess? (location? feature?)
 - Change coord. system of data view to find match.

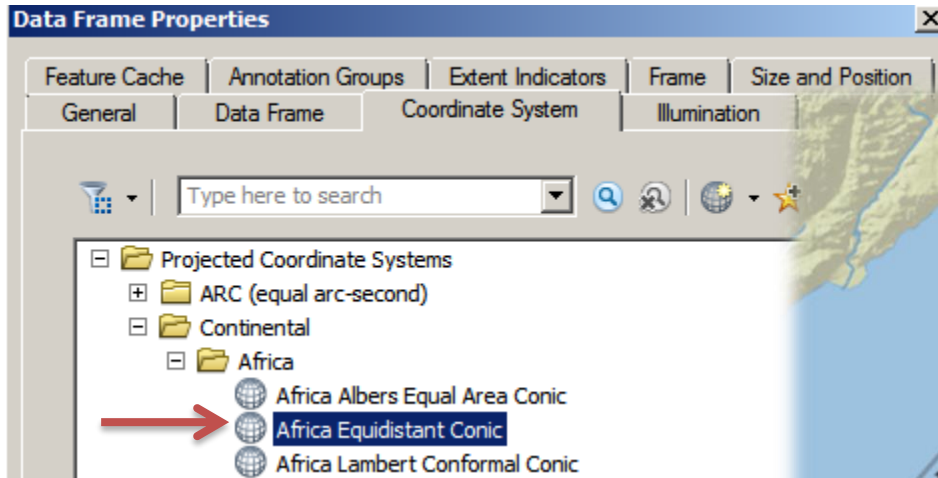


Guessing at projections...



Close, but not quite...

Guessing at projections...



Bingo!

Next:

- *Define projection and/or project data*

NOTE: *Project* Tool



- Grab input feature from folder, not from map
 - Issue with software if added as a map layer
- When projecting a feature class w/ and undefined projection:
 - You must provide an input projection
 - This will define that feature class's projection

Searching for Data

- *Public domain data* → Population



- *On-line geospatial data platforms:*

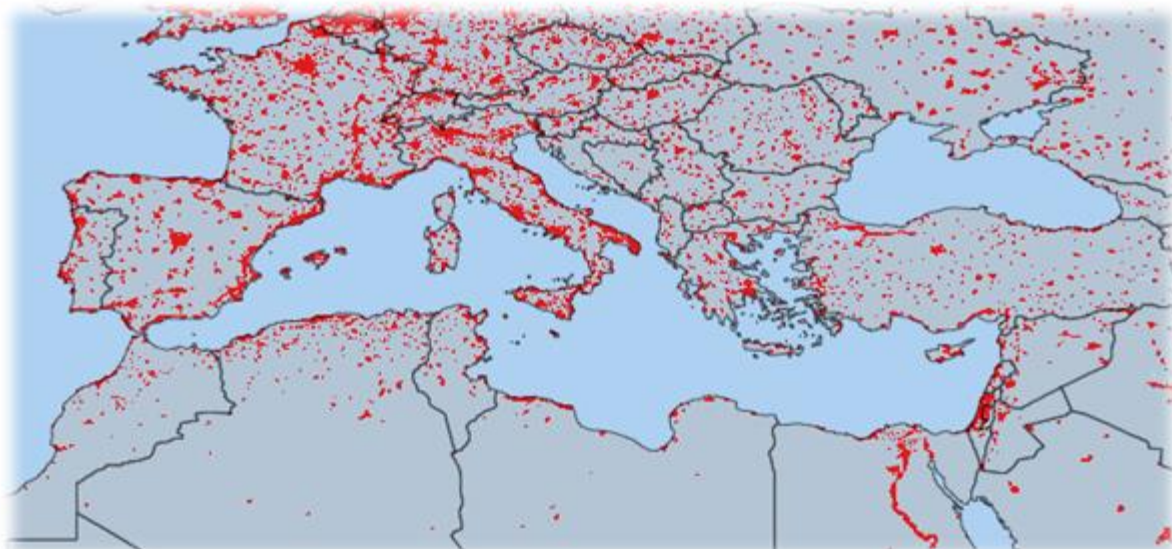
- **ArcGIS Online** → Wetlands

- DATA  BASIN → Protected areas

Population Data

Demographics: GRUMP

- Global Rural-Urban Mapping Project, V.1 (GRUMPv1)
<http://sedac.ciesin.columbia.edu/maps/gallery/collection/grump-v1>
 - Dates: 1990, 1995, 2000
 - 30 arc-second (~1 km) resolution
 - Modeled from night-time lights and buffered settlement points




Population Data



- Locate\download population data for Uganda
- Add to map & symbolize
- Is the dataset properly georeferenced?
- Should you [re]project the data?

Population - Landscan




Sakai...

 [Up one level](#)

Data Sources and leads


-  [Conservation-GeoPortal-Intro-demo.ppt](#)
-  [Data 101: Fundamentals of data in GIS \(USAID\)](#)
-  [Duke Library: Data and GIS Services](#)
-  <http://spatialreserves.wordpress.com/>
-  [Kerski_PublicDomainData_Chaper1.pdf](#)
-  [Link to Decker \(2001\) - Conservation Data Sources](#)
-  [The GIS Guide to Public Domain Data \(Kerski 2012\)](#)
-  [LandScan population data accessible via Duke Libraries](#)

East View Geospatial LandScan Global Archive.

Format:  Database;  Internet resource;  Serial

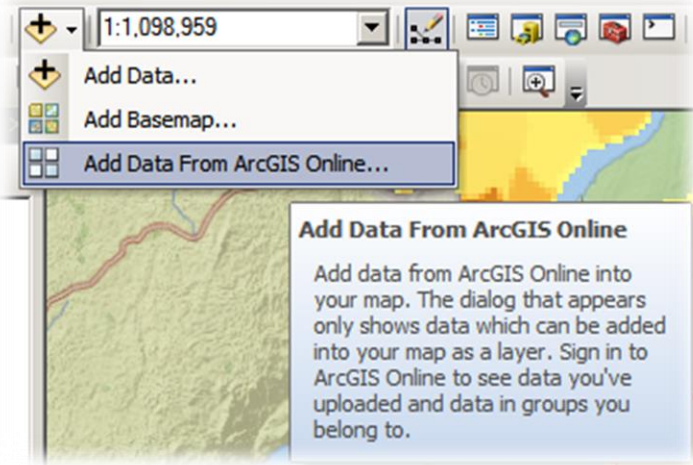
Published: [Minneapolis] : East View Geospatial

Language: English

Online Access: 

Summary: The LandScan Global Population Database provides global population distribution in a gridded GIS format at 30 arc-second resolution (approximately 1x1 km cells). Oak Ridge National Laboratory developed modeling techniques to disaggregate and interpolate census data within administrative boundaries to create a GIS layer showing population distribution as accurately and as timely as possible. EastVi... ([see more](#))

ArcGIS Online



ArcGIS Online

- Search by theme: wetlands

The screenshot shows the ArcGIS Online search results page for the query 'Wetlands'. The search bar at the top is highlighted with a red box and contains the text 'Wetlands'. The page displays a grid of search results, each with a title, a small map thumbnail, a description, and metadata including the creator and date. The results are arranged by relevance, and there are 545 results in total. The first five results are visible on the page.

World Hydro Reference Overlay
The World Hydro Reference Overlay Map service is designed to be used as a base map by scientists, professionals, and researchers in the fields of Hydrology, Geography, Climate, Soils, and other natural sciences.
Map Service by [HydroTeamRC](#) 7/22/2013 [Details](#) [Add](#)

Global Wetlands (1993)
Global Wetlands (1993)
Map Service by [UNEP-WCMC-Global](#) 10/3/2011 [Details](#) [Add](#)

National Wetlands Inventory - Wetlands Web
Wetlands and Deepwater Habitats of the United States and its Trust Territories (1:250,000 display scale). Use the Wetlands REST service with the Wetlands Status REST service which identifies where wetlands are.
Map Service by [FWS_FHC](#) 3/14/2013 [Details](#) [Add](#)

Framework: Bioscience (Wetlands) - WM
Framework map service for Oregon Bioscience Theme: Wetlands Data (Web Mercator Aux Sphere)
Map Service by [navigatOR2010](#) 2/28/2013 [Details](#) [Add](#)

wetlands_wm
The Wetlands layer has been extracted from the statewide 2007 Land Use/Land Cover layer.
Feature Service by [edapalinski](#) 12/5/2013 [Details](#) [Add](#)

California coastal wetlands (Data Basin Data)
This dataset distinguishes coastal wetlands from inland wetlands while retaining the attributes from the original National Wetlands Inventory (NWI) data.
Layer Package by [consbio](#) 5/15/2011 [Details](#) [Add](#)

1 2 3 4 5 Next

ArcGIS Online

- Search by location: ~~Albertine Rift~~ Uganda

The screenshot shows the ArcGIS Online interface. At the top left is the ArcGIS Online logo. A search bar in the top center contains the text 'Uganda', which is highlighted with a red rectangular box. To the right of the search bar are buttons for 'Data' and 'Groups', and a 'Sign in' link. Below the search bar, there are navigation arrows and a 'Featured' section. The main search results area shows 'Search: Uganda' and 'Arranged by Relevance' with a dropdown arrow. It indicates '56 Results'. Three search results are visible:

- Uganda protected areas (Data Basin Dataset)**: A thumbnail map showing orange and yellow areas. Description: 'Gazetted areas of Uganda as of 2007.' Layer Package by consbio, 5/13/2011. Details Add
- Water bodies of Uganda (Data Basin Dataset)**: A thumbnail map showing blue areas. Description: 'Main open water bodies of Uganda.' Layer Package by consbio, 5/12/2011. Details Add
- Wetlands extent and types for Uganda -1996**: A thumbnail map showing blue and green areas. Description: 'Extent and types (permanent and seasonal) of wetlands in Uganda, extracted from the national 1996 land cover map, based on interpretation of satellite images.' Layer Package by consbio, 5/13/2011. Details Add

The right-hand side of the interface shows a detailed view of the selected search result: **Wetlands extent and types for Uganda**. It includes a thumbnail map, the text 'Layer Package', 'Owner: consbio', 'Date modified: 5/13/2011', and '0 Ratings'. Below this are tabs for 'Description', 'Properties', and 'Comments (0)'. The 'Description' tab is active, showing the text: 'Extent and types (permanent and seasonal) of wetlands in Uganda, extracted from the national 1996 land cover map, based on interpretation of satellite images.' and 'This layer package was loaded using Data Basin. Click here to go to the detail page for this layer package in Data Basin, where you can find out more information, such as full metadata, or use it to create a live web map.' A red arrow points to the right side of the detailed view panel.


Data Basin

Sign Up

Sign In ▾

Support ▾



Search by keyword or location 

Get Started

Explore

Create

Community

My Workspace

What is Data Basin?

What can I do?

Who is using Data Basin?

How do I start exploring?

Data Basin is a science-based mapping and analysis platform that supports learning, research, and sustainable environmental stewardship.



- Search by theme, location, or both...

Data Basin

Search: [more options](#)

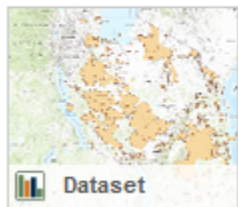
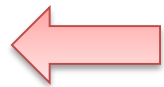
Sort by: Display:  



Uganda protected areas

National Forest Authority

Gazetted areas of Uganda as of 2007.



Protected Areas

WDPA with minor editing by Lindsay Spurrier 2012

Protected areas of Tanzania

Conservation Biology

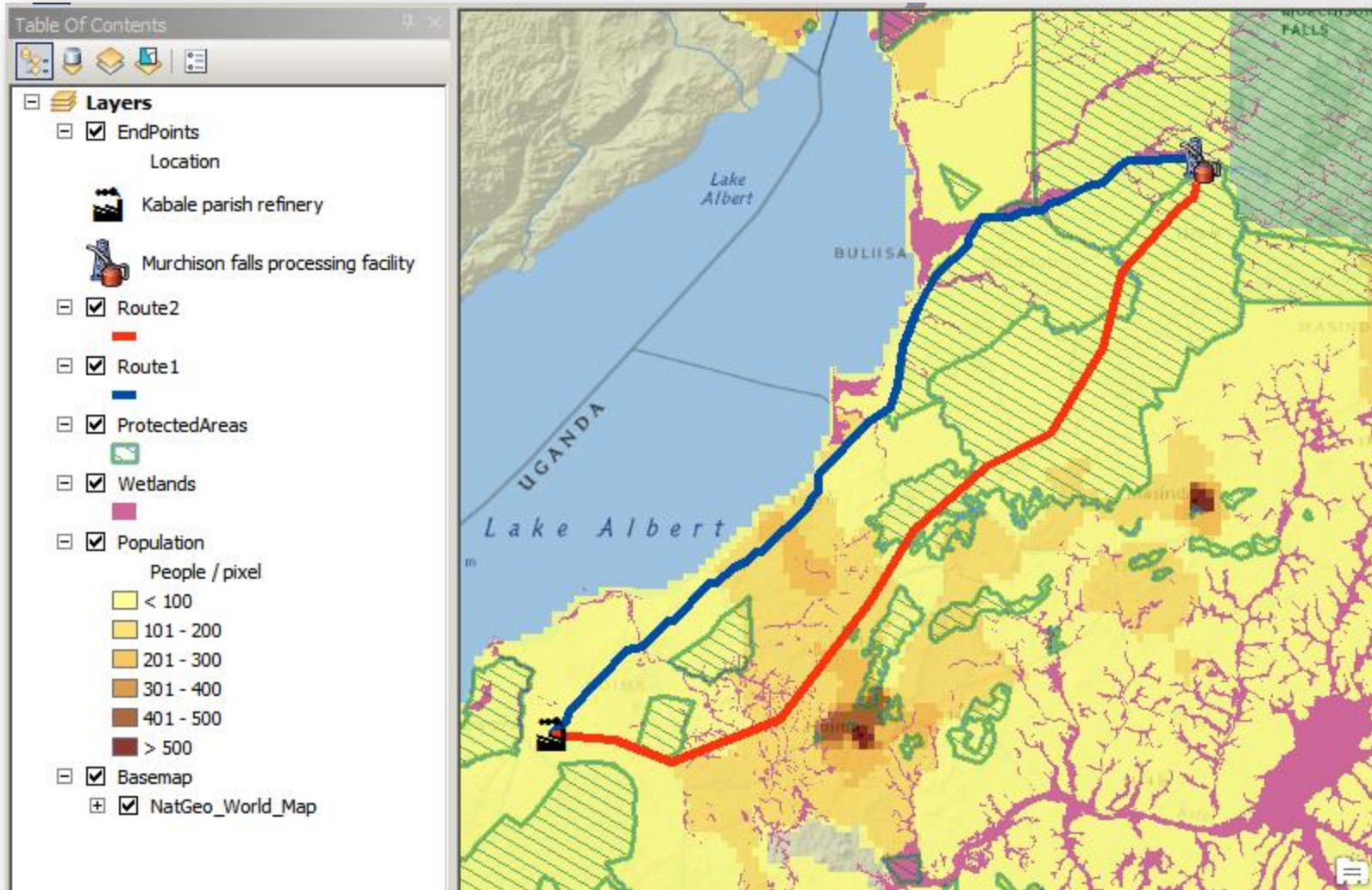
- Open in Map
- Add to My Workspace
- Download ArcGIS Layer Package
- Download Zip Archive



Lindsay Spurrier (Apr 15, 2013)

- Download, extract, add to map. [Reproject]

All data prepped...



Analysis

- Population
 - Buffer pipeline route 2.5km
 - Zonal Stats as Table (Buffer on Population) *~35k people*
- Wetlands
 - Clip wetlands feature class with buffered route
 - Calculate total area (km²) *~56.2km²*
- Pipeline in protected area
 - Clip route using projected area feature class
 - Determine total length (km) *~45.3km*

Report results

Compile results concisely and effectively...

- For each proposed route:
 - Number of people affected?
 - Area of wetland affected?
 - Length within protected area?