Project 1:
Albertine Rift Pipeline Analysis
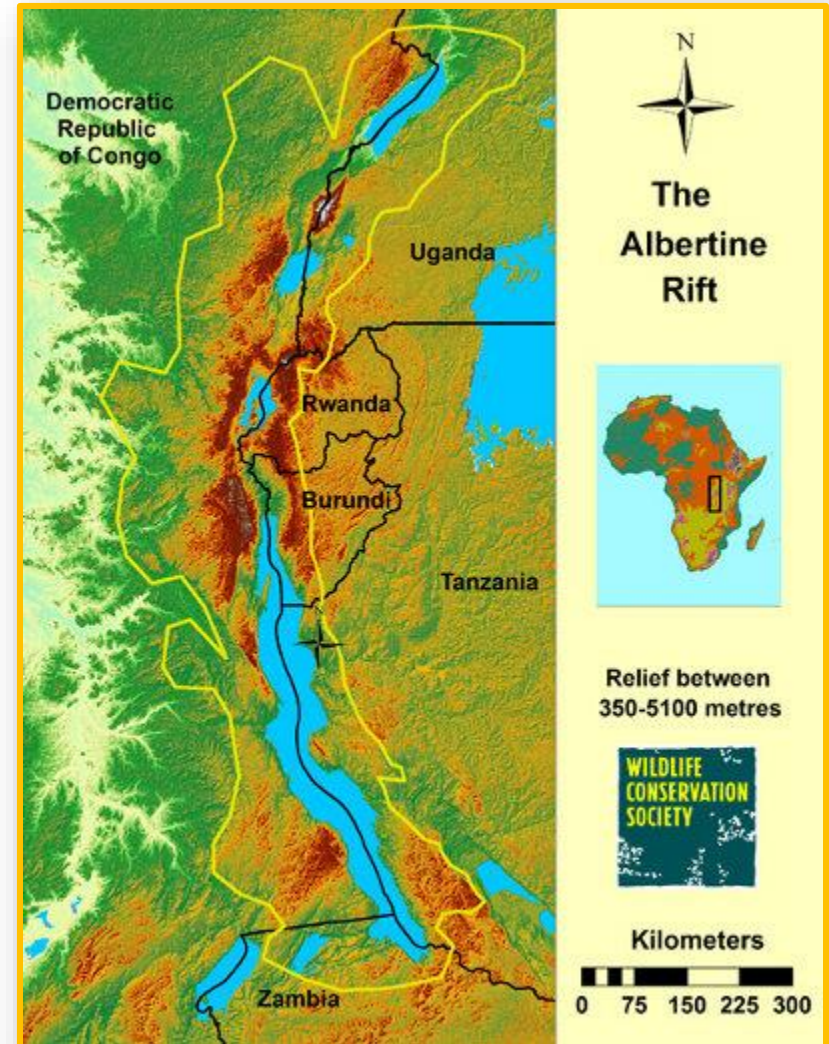
ENVIRON 761

Geospatial Applications for Conservation & Land Management

Section 1: Project-based GIS

Impact analysis of two proposed oil pipelines in the Albertine rift
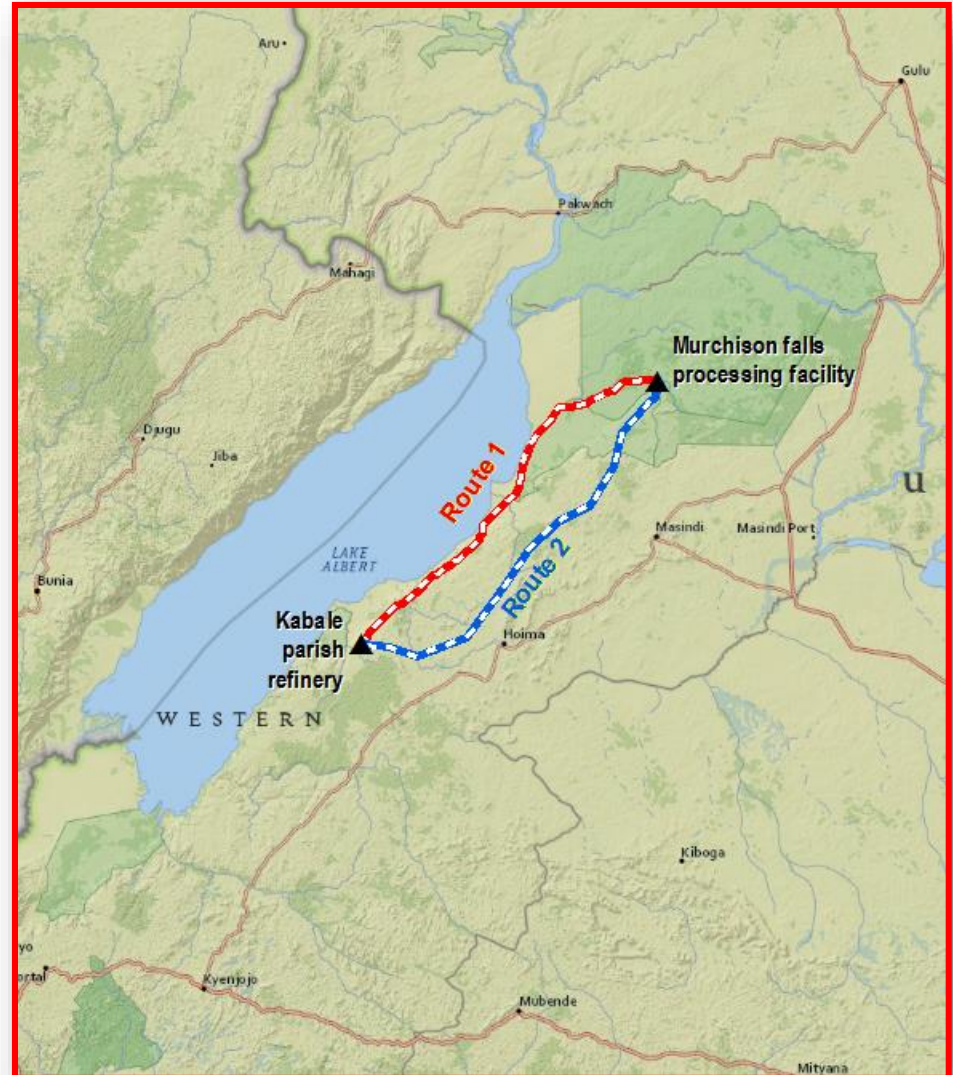

http://www.albertinerift.org

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)
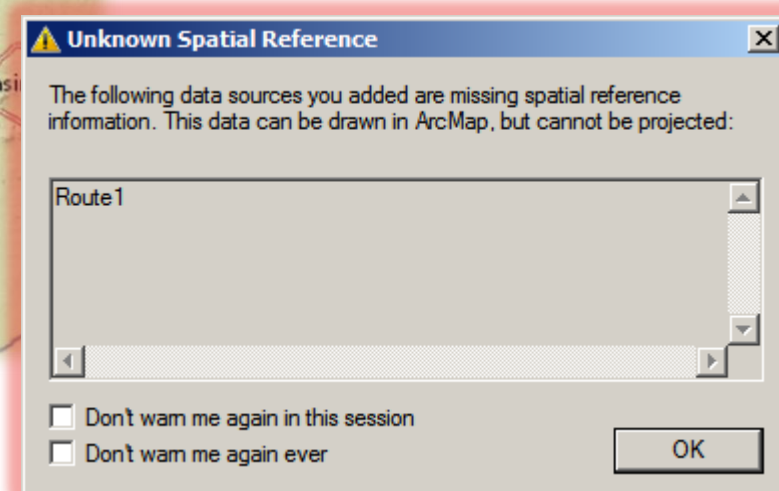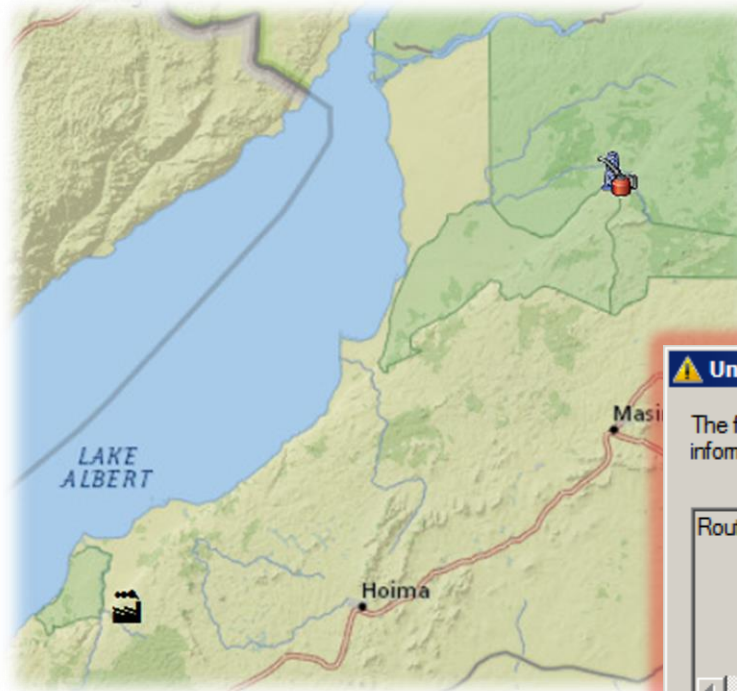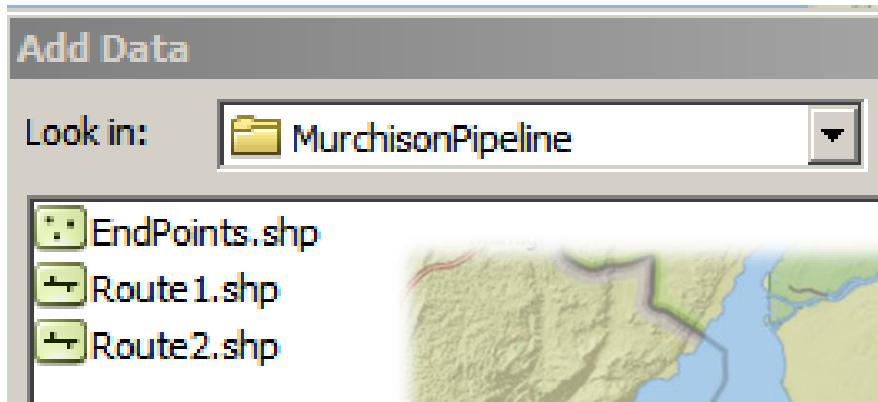
Guessing at projections

- 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.
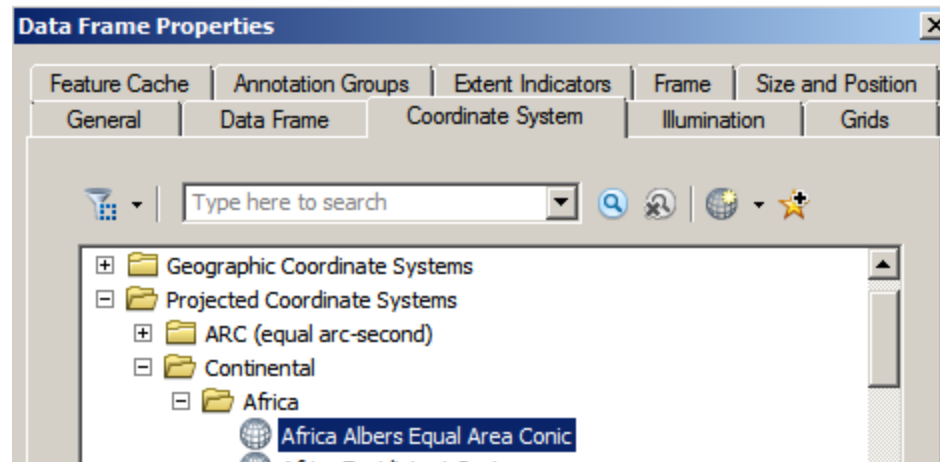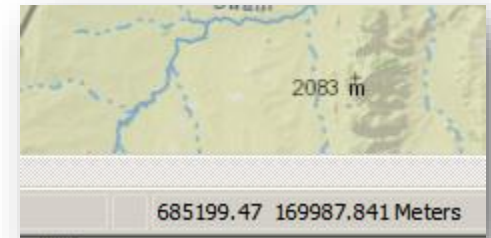
Guessing at projections…
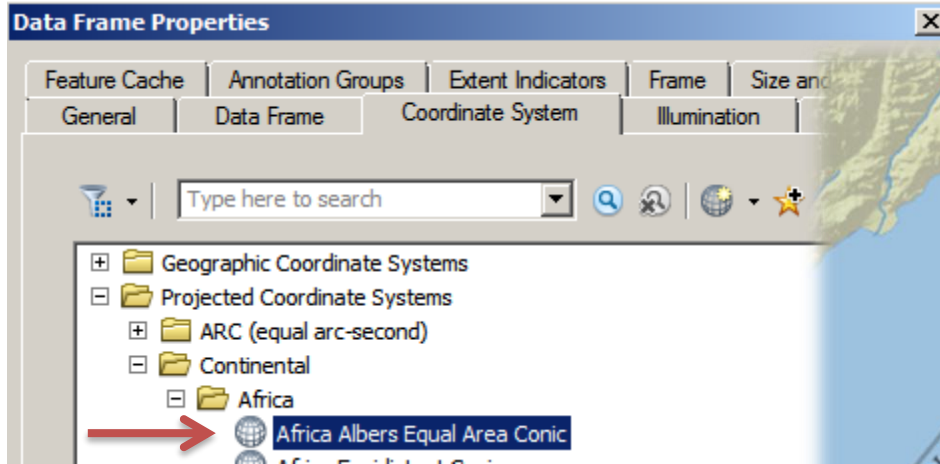
Close, but not quite…

Guessing at projections…
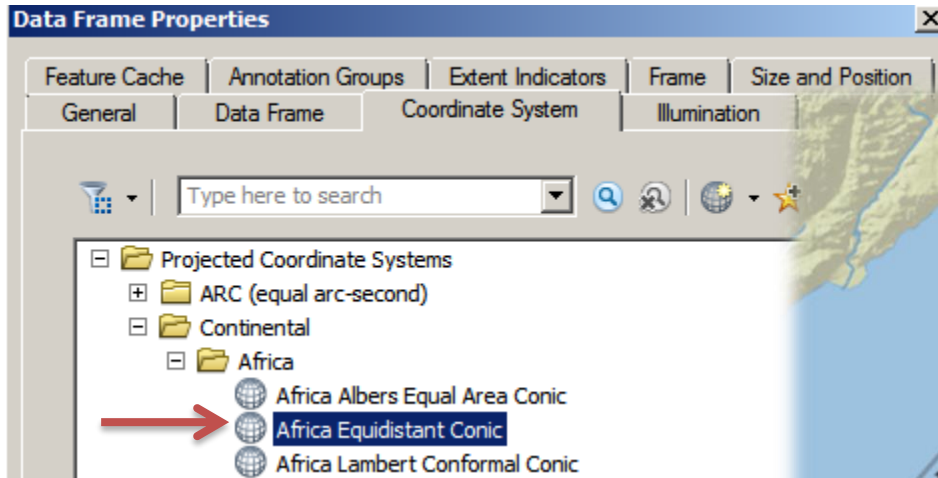
Bingo!

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:*

  - → Wetlands

  - → 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
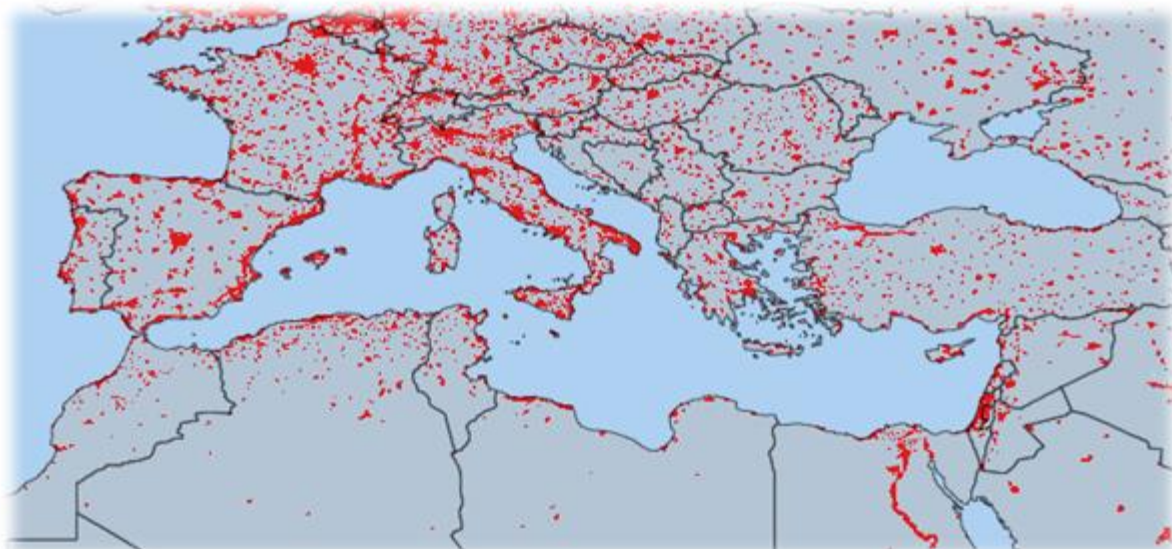
Population Data

- Locate\download population data for Uganda

- Add to map & symbolize

- Is the dataset properly georeferenced?

- Should you [re]project the data?

Population - Landscan

Sakai...

ArcGIS Online

ArcGIS Online

- Search by theme: wetlands

ArcGIS Online

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

Data Basin

- Search by theme, location, or both…

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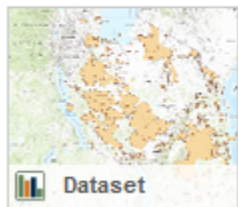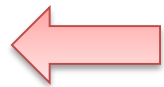
- Download, extract, add to map. [Reproject]

All data prepped…
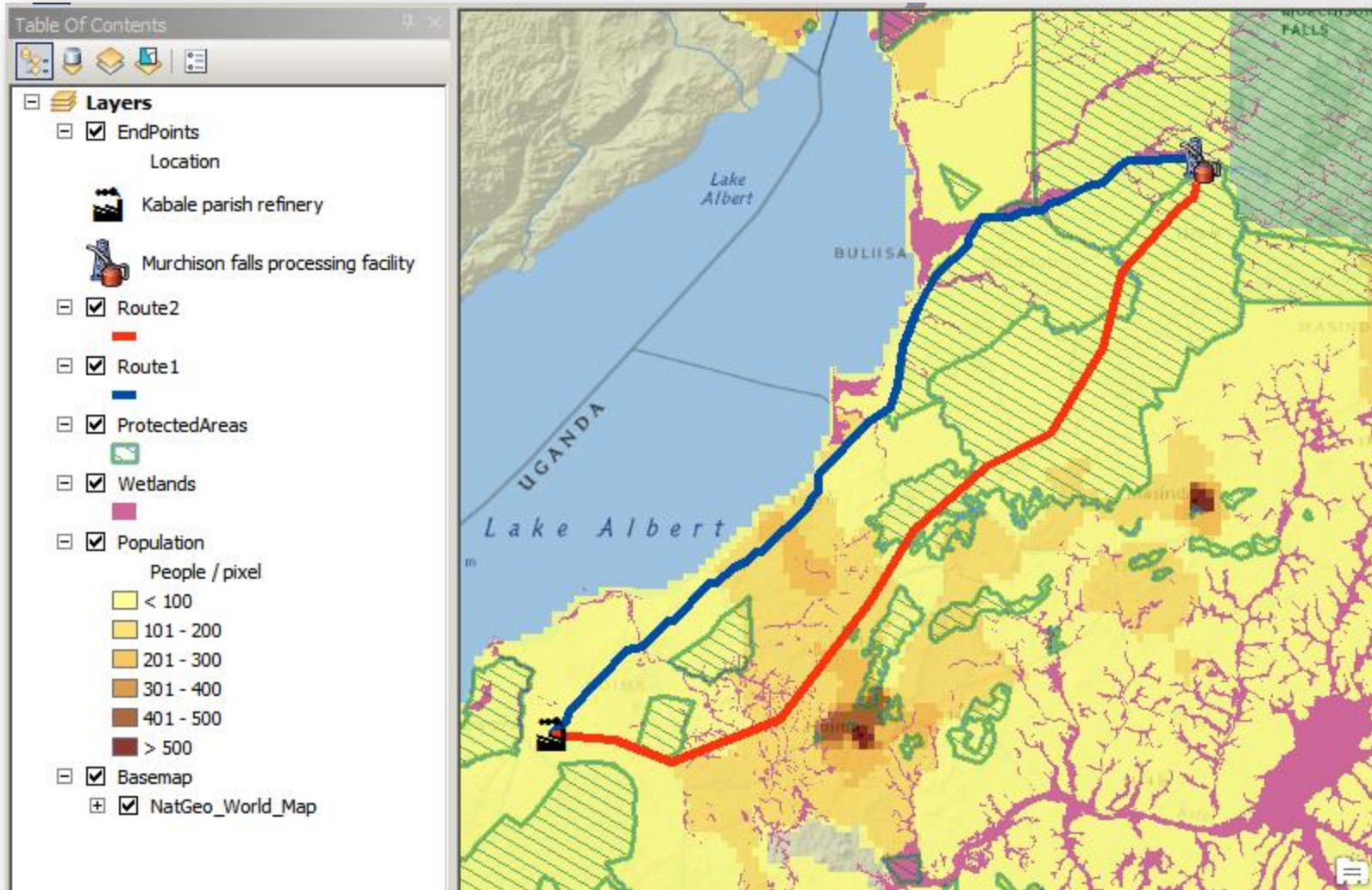
Analysis

- 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)   *~56.2km^2*

- 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?