GEOM 4009
Planning Group Project

Mitch, Lucas, Ethan, Nata, Winaa

Intro – to organization/client

- Adrian Gerhartz, Nunavut Planning Commission (NPC) - Iqaluit (Planning/ GIS)
- Using available knowledge/ data to ID key areas to protect
- Reviews and approves project proposal against land use plans

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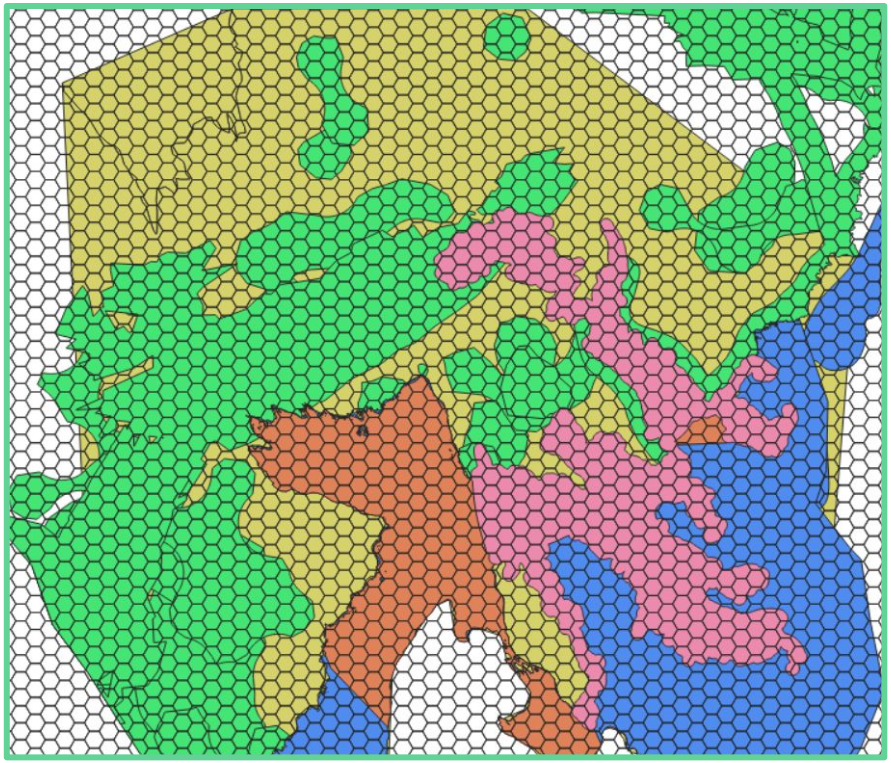
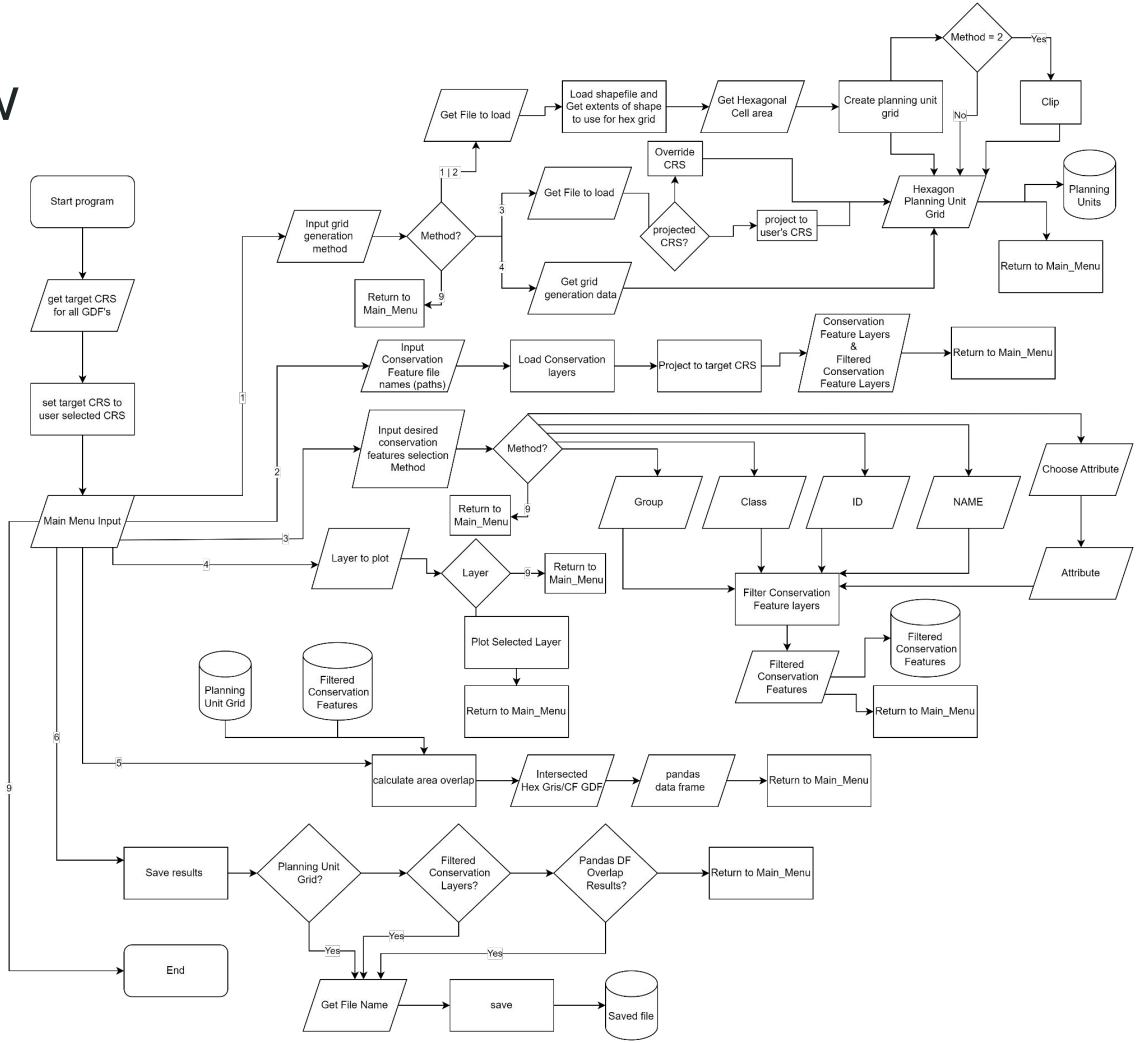
Nunavut Planning Commission
Nunavunmi Parnaiyiit

Intro – project purpose and scope

- Generate hexagonal planning grid
- Overlay with various conservation features
- Determine area of feature within each cell
- Formatting output for use in Marxan



Workflow


Start program
get target CRS for all GDF's
set target CRS to user selected CRS
Main Menu Input
Input grid generation method
Method?
Get File to load
Load shapefile and Get extents of shape to use for hex grid
Get Hexagonal Cell area
Create planning unit grid
Method = 2
Yes
No
Clip
Override CRS
Get File to load
projected CRS?
project to user's CRS
Hexagon Planning Unit Grid
Planning Units
Return to Main_Menu
Get grid generation data
Return to Main_Menu
Input Conservation Feature file names (paths)
Load Conservation layers
Project to target CRS
Conservation Feature Layers & Filtered Conservation Feature Layers
Return to Main_Menu
Input desired conservation features selection Method
Method?
Group
Class
ID
NAME
Choose Attribute
Return to Main_Menu
Attribute
Layer to plot
Layer
Return to Main_Menu
Filter Conservation Feature layers
Plot Selected Layer
Filtered Conservation Features
Filtered Conservation Features
Planning Unit Grid
Filtered Conservation Features
Return to Main_Menu
Return to Main_Menu
calculate area overlap
Intersected Hex Gris/CF GDF
pandas data frame
Return to Main_Menu
Save results
Planning Unit Grid?
Filtered Conservation Layers?
Pandas DF Overlap Results?
Return to Main_Menu
End
Yes
Yes
Yes
Get File Name
save
Saved file

Documentation

- Dependencies
  - Python >= 3.10
  - Geopandas - geospatial data handling
  - Shapely - geometry creation
  - pandas - csv output
  - matplotlib - visualizations
  - tkinter - GUI toolkit
  - psutil - process and system utilities
- Installation and set up
- User guide and Troubleshooting
- Sphinx documentation

Conservation Planning Project

Navigation

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Welcome to Conservartion Planning Project's documentation!

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Indices and tables

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Demo

- Basic Installation
- Core functionality
- General usage and program interaction

- Download or clone this repository, navigate to it in an Anaconda Prompt, and type

```
conda env create -f planningproj_env.yml
```

- Once this has completed activate the environment with

```
conda activate planningproj_env
```

- You can then run the script with

```
python planning.py
```

```
Main Menu:
    1  Create Planning Unit Grid
    2  Load Conservation Features Files
    3  Filter Conservation Features
    4  View Layers
    5  Calculate Overlap
    6  Save Results
    9  Quit
>>>
```

Challenges

- Querying a list of geodataframes
- Marxan filetype
- Writing the grid and generating the function
- Grid projection errors

Limitations

- Very long runtime for file loading
- File save for the GeoPackage

Future Work

- Improving plotting
- Easier to use
- Interactive components
- Speed

Conclusion

- Project was a success with limited issues/obstacles
- Met all client requirements
- Will (hopefully) be used in conservation planning tasks
- Interesting, challenging and rewarding experience

Acknowledgments

- Thank you to Adrian Gerhartz
- Thank you to Derek Mueller