

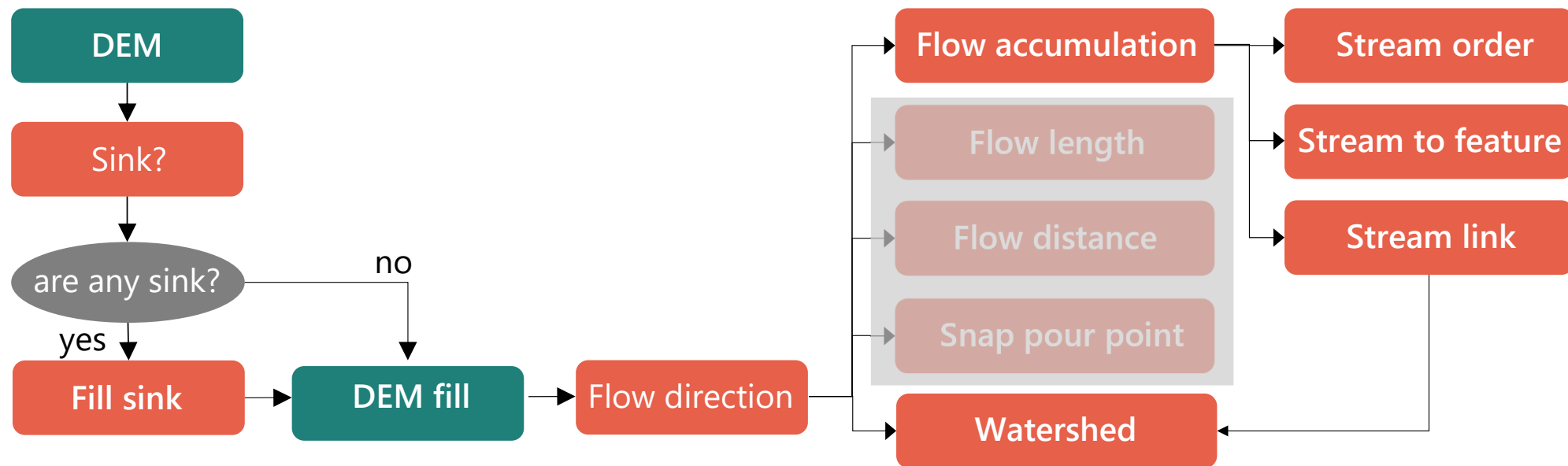
GIS10 River flow

Luc Girod – GEO(3|4)460 – Spring 2025

Modeling the water flow

As seen in class, this is the process of identifying rivers and watersheds:

□ The process for hydrologic modeling



Geoprocessing

Fill

Parameters Environments

Input surface raster
FinseHike_DTM_10m.tif

Output surface raster
Fill

Z limit

Geoprocessing

Flow Direction

Parameters Environments

Input surface raster
Fill

Output flow direction raster
FlowDirection

☐ Force all edge cells to flow outward

Output drop raster

Flow direction type
D8

Geoprocessing

Flow Accumulation

Parameters Environments

Input flow direction raster
FlowDirection

Output accumulation raster
FlowAccumulation

Input weight raster

Output data type
Float

Input flow direction type
D8

Geoprocessing

Con

Parameters Environments

Input conditional raster
FlowAccumulation

Expression
Load Save Remove

Where VALUE is greater than 3000

+ Add Clause

Input true raster or constant value
FlowAccumulation

Input false raster or constant value
0

Output raster
FlowAccumulation_3000

Choose your own by
thresholding
FlowAccumulation

Geoprocessing ⌵ 📌 ✕

⬅ Stream Order ➕

Parameters Environments ?

Input stream raster
FlowAccumulation ⌵ 📁

Input flow direction raster
FlowDirection ⌵ 📁

Output raster
StreamOrder ⌵ 📁

Method of stream ordering
Strahler ⌵

Geoprocessing ⌵ 📌 ✕

⬅ Stream Order ➕

Parameters Environments ?

Input stream raster
FlowAccumulation_3000 ⌵ 📁

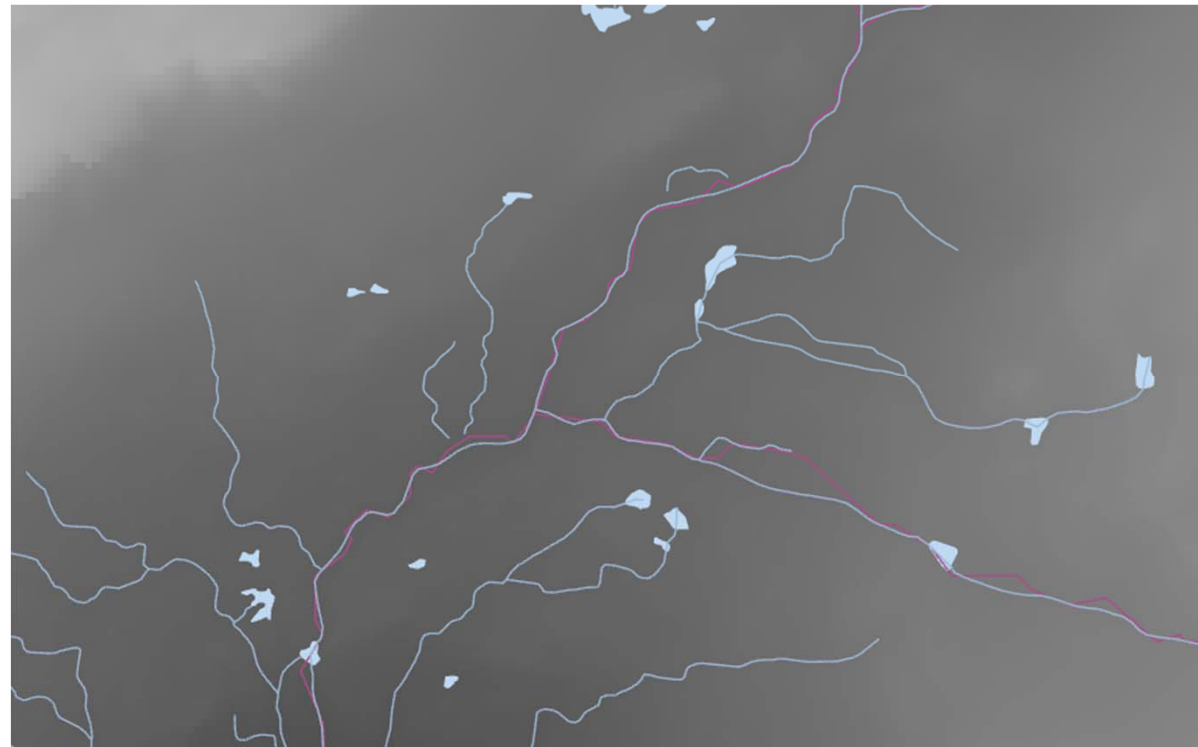
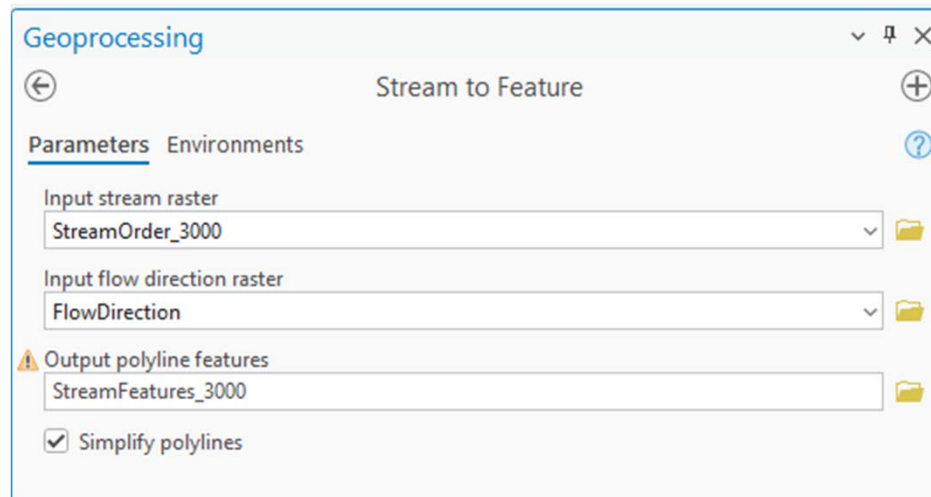
Input flow direction raster
FlowDirection ⌵ 📁

Output raster
StreamOrder_3000 ⌵ 📁

Method of stream ordering
Strahler ⌵

How different are those?

Comapre with provided N50 kartdata



Geoprocessing

Stream Link

Parameters Environments

Input stream raster

StreamOrder_3000

Input flow direction raster

FlowDirection

Output raster

StreamLink

Geoprocessing

Watershed

Parameters Environments

Input D8 flow direction raster

FlowDirection

Input raster or feature pour point data

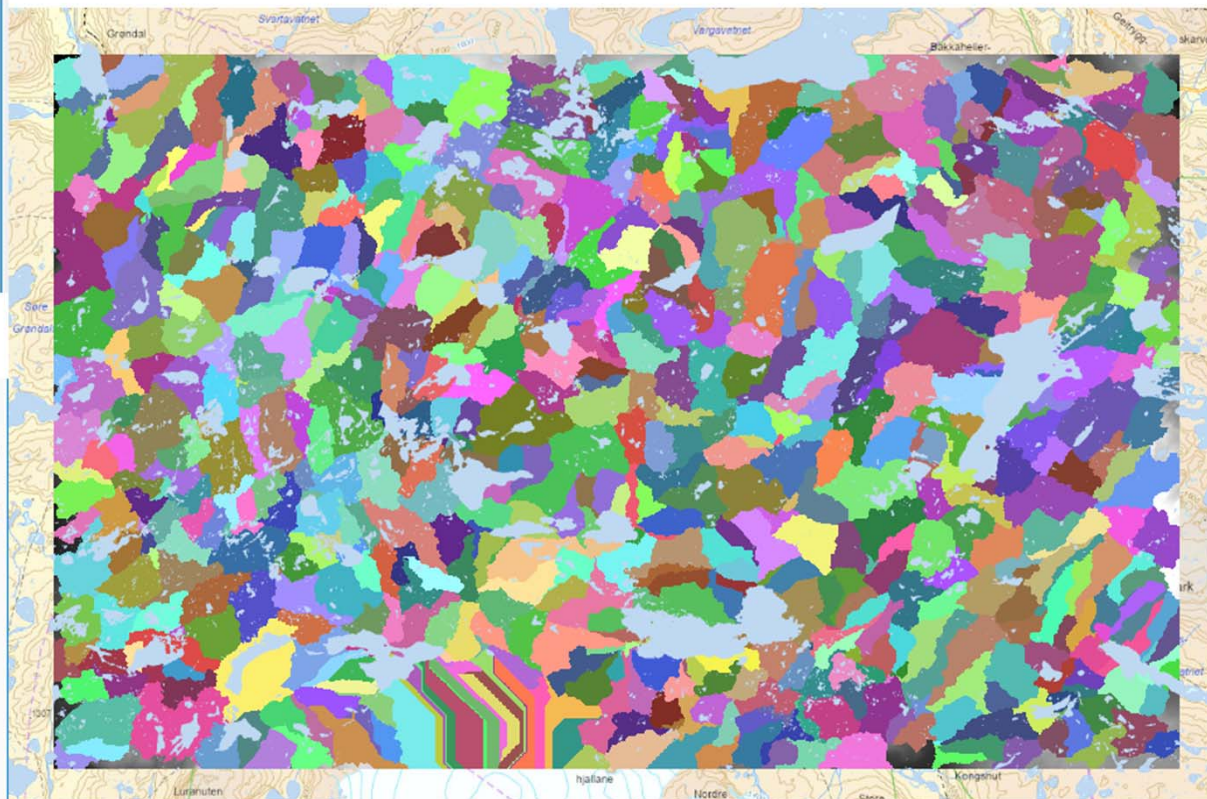
StreamLink

Pour point field

Value

Output raster

Watershed_3000



Removing small order rivers to get larger watersheds

Geoprocessing

Parameters Environments

Input conditional raster
StreamOrder_3000

Expression
Load Save Remove

SQL ☐

Where Value is greater than 2

+ Add Clause

Input true raster or constant value
StreamOrder_3000

Input false raster or constant value

Output raster
StreamOrder_3000_min3

Geoprocessing

Stream Link

Parameters Environments

Input stream raster
StreamOrder_3000_min3

Input flow direction raster
FlowDirection

Output raster
StreamLink_3000_min3

Geoprocessing

Watershed

Parameters Environments

Input D8 flow direction raster
FlowDirection

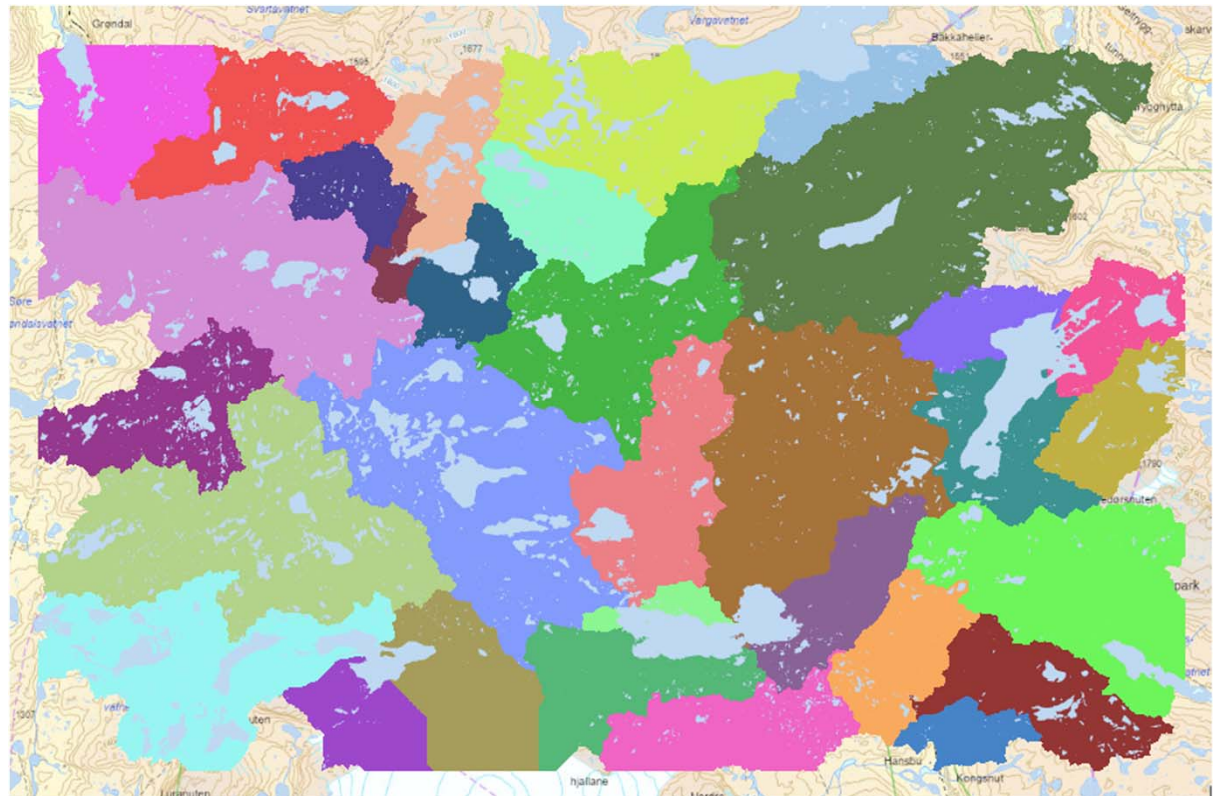
Input raster or feature pour point data
StreamLink_3000_min3

Pour point field
Value

Output raster
Watershed_3000_min3

Accumulation 300+ River order 3+ watersheds

- Edge areas don't get a watershed as there was no rivers of order 3+ there
- Watersheds are much bigger now



Lab report

- Run this in another location
- Find a way to incorporate lakes in this process
- Compare with N50 rivers