

Watershed and Tree Canopy Association in Austin, TX



Progress Report

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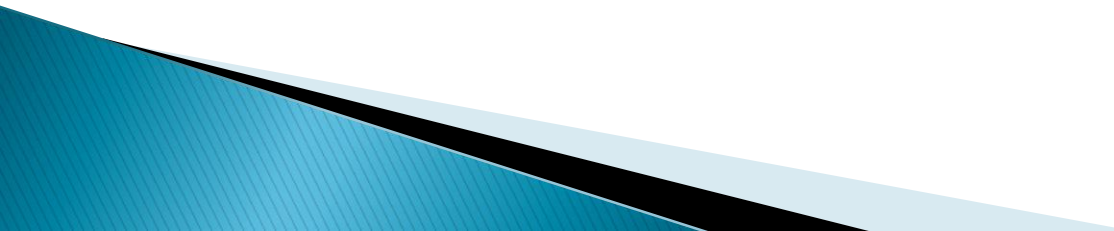
Chad Sydow, *GIS Analyst*

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San Marcos, TX

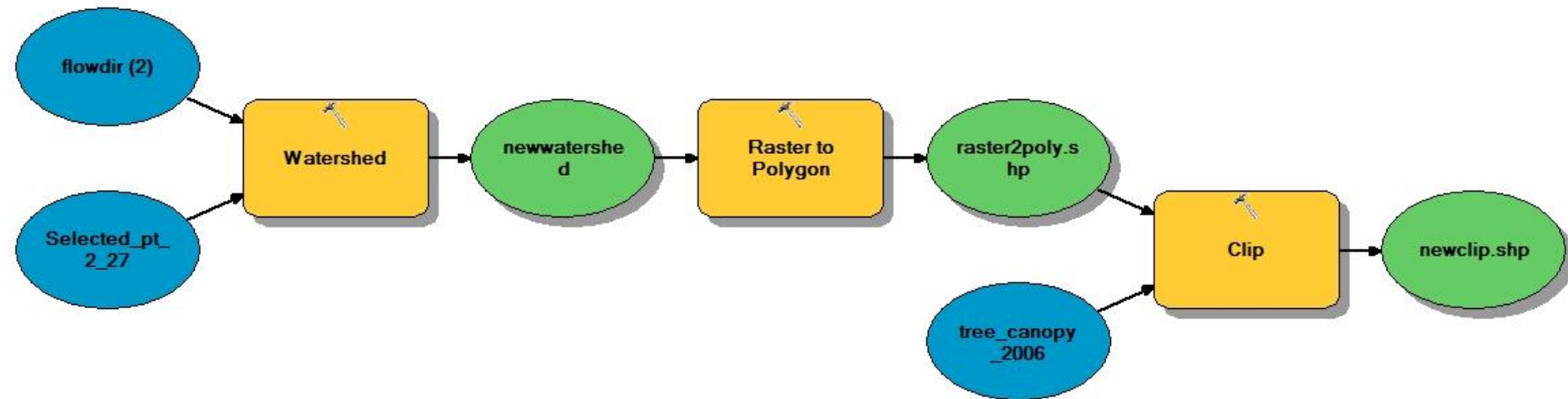
Project Review

- ▶ Objectives:
 - Develop a replicable model to create watersheds from sampling points
 - Perform a pilot project to demonstrate this model to the client
 - Repeat process for as many sampling points as project timeline allows
 - Calculate percentage of tree canopy cover for each watershed created

Progress Overview

- ▶ Model development: **completed**
 - ▶ Pilot project: **completed**
 - ▶ Data preparation for watershed creation:
in progress
 - ▶ Watershed creation for all EII points:
incomplete
 - ▶ Tree canopy coverage calculation:
incomplete
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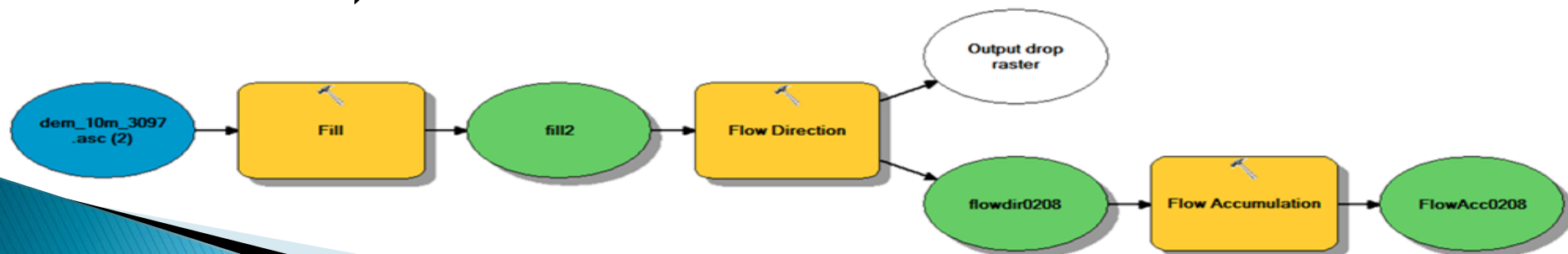
Model Development



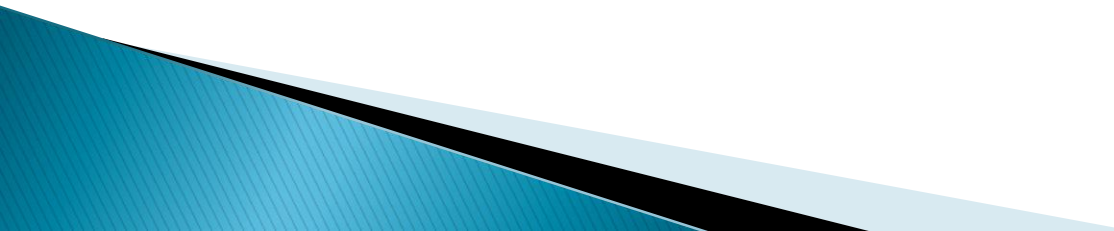
- This model was developed for use with the pilot project
- The selected point was chosen for our pilot project from the EII water quality points provided by the City of Austin
- This model was used to create the watershed and the clip of the tree canopy to the watershed for percent coverage

Pilot Project: Step 1

- Acquire Austin Area DEMs
- Create Fill Raster to remove small imperfections
- Make Direction Raster to determine flow direction
- Develop Accumulation Raster of accumulated flow into each cell
- This Raster would establish that the EII stations were in high accumulation lines (rivers, creeks, streams)

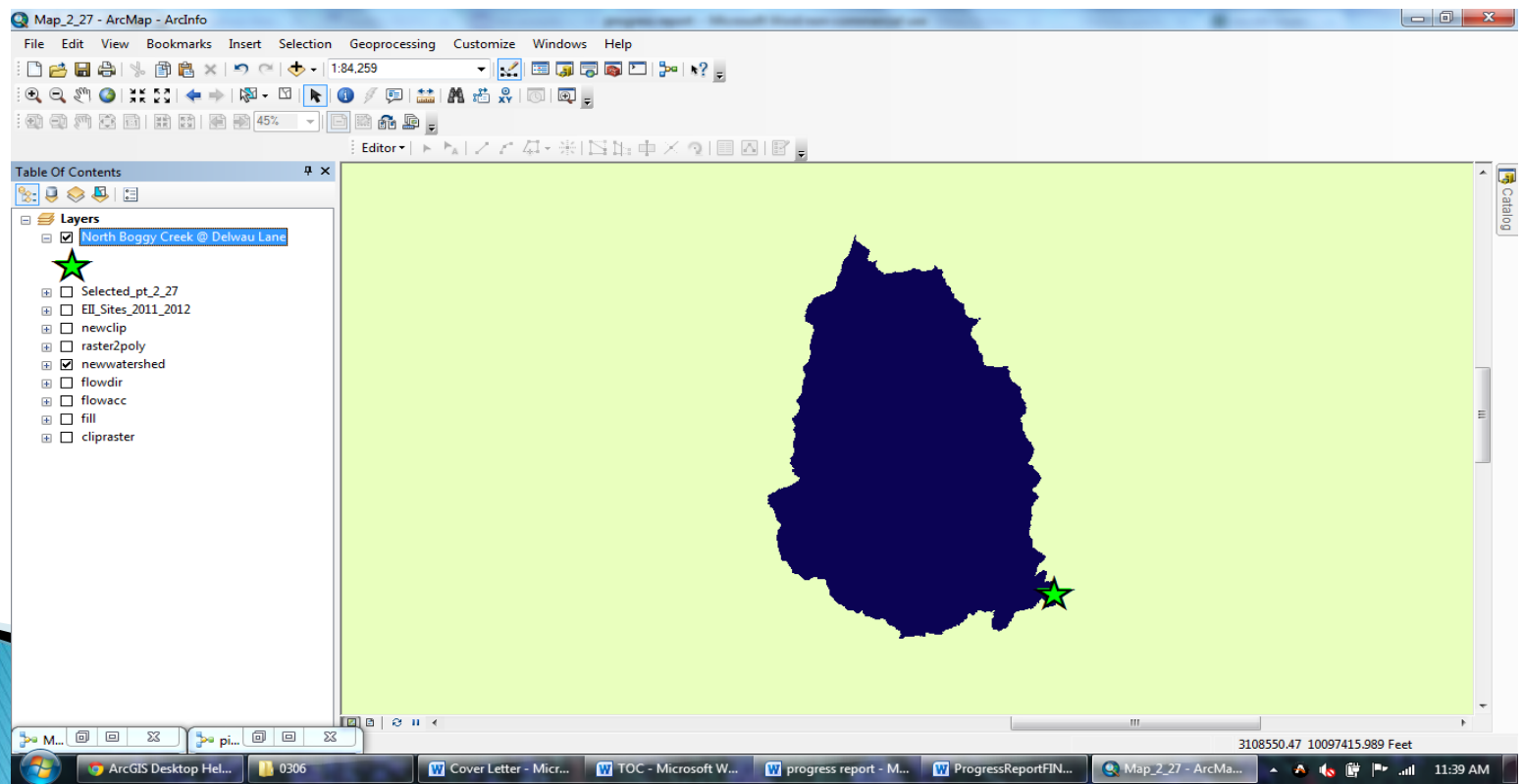


Pilot Project: Step 2

- Introduce EII station points (water quality reading stations along streams and rivers in Austin)
 - For our initial pilot project, only one point was used and chosen at random
 - The point chosen was North Boggy Creek @ Delwau Lane
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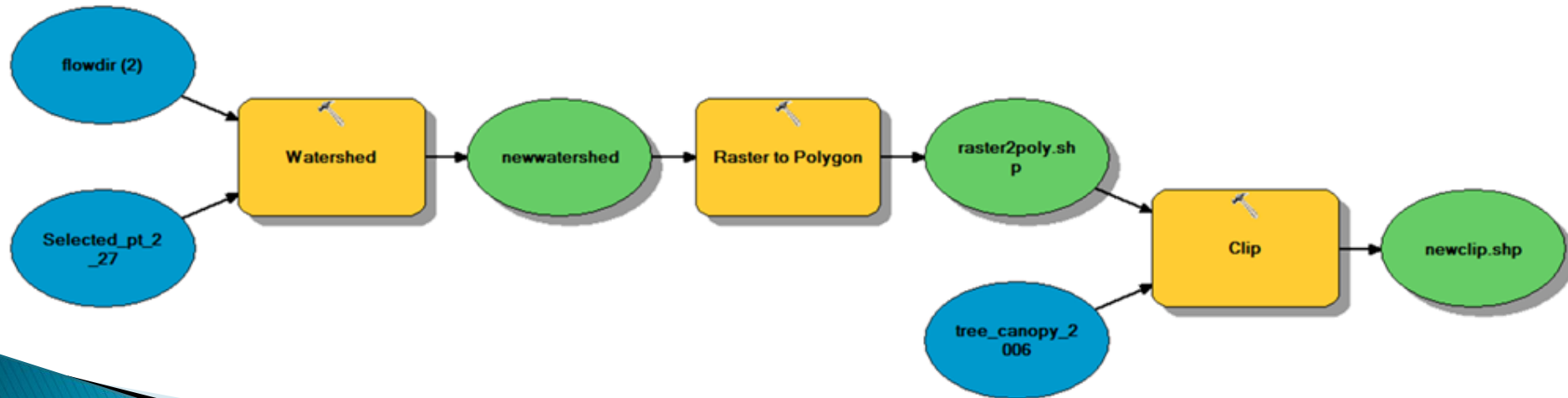
Pilot Project: Step 2

- Use watershed tool with flow-direction raster
- Show the contributing area of drainage above the selected point
- Watershed delineation was successful



Pilot Project: Step 3

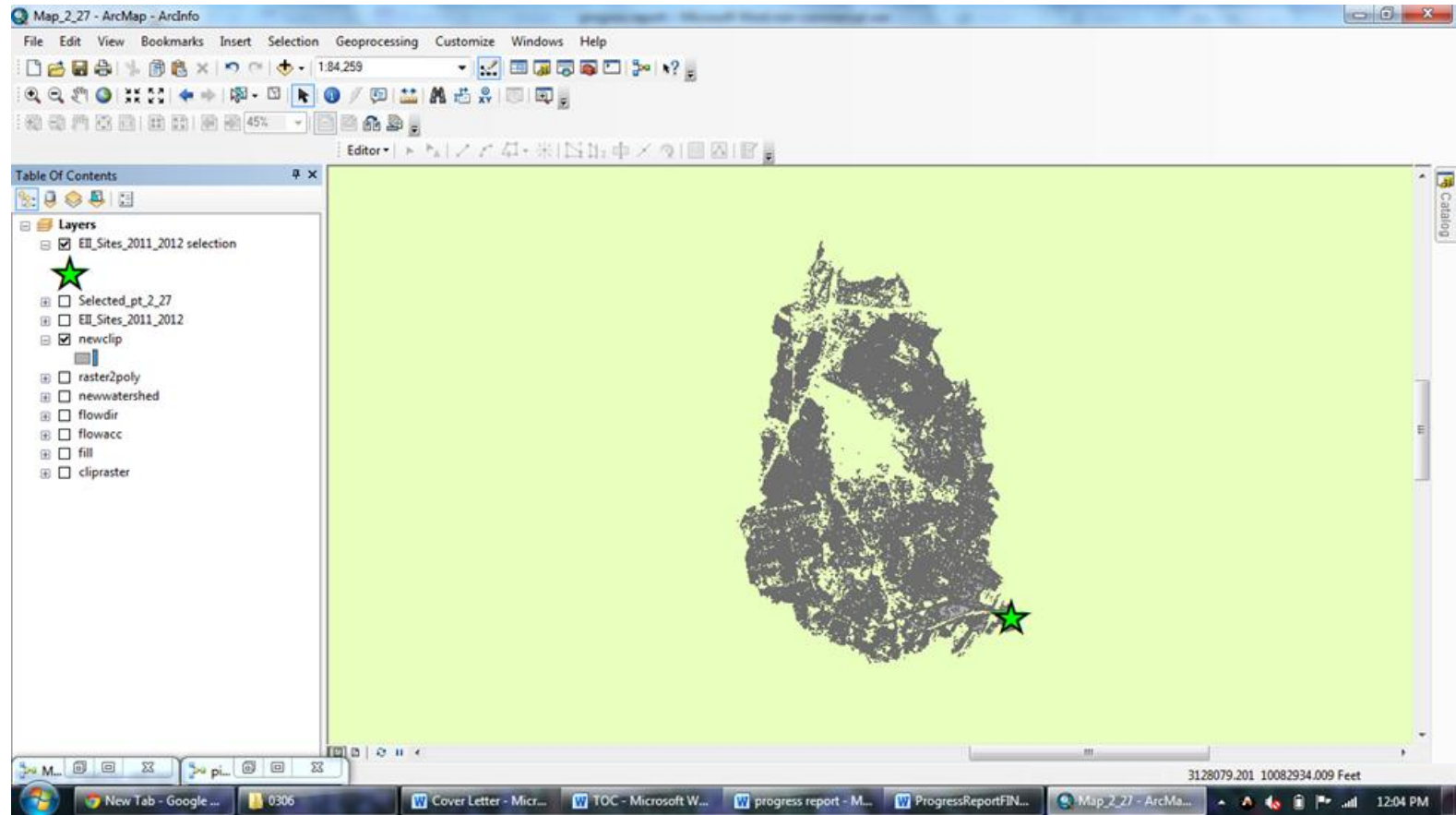
- Converting the watershed from raster to polygon
- Project Austin tree canopy data
- Clip to isolate only canopy coverage over delineated watershed



Pilot Project: Step 4

- Determine canopy coverage in the watershed
 - Calculating the area of the canopy clip using geometry tool in the attribute table
 - Find the area of the watershed polygon in the layer's attribute table under "area"
 - Finally, divide the clip area by the polygon area
- Result: 28% tree canopy cover

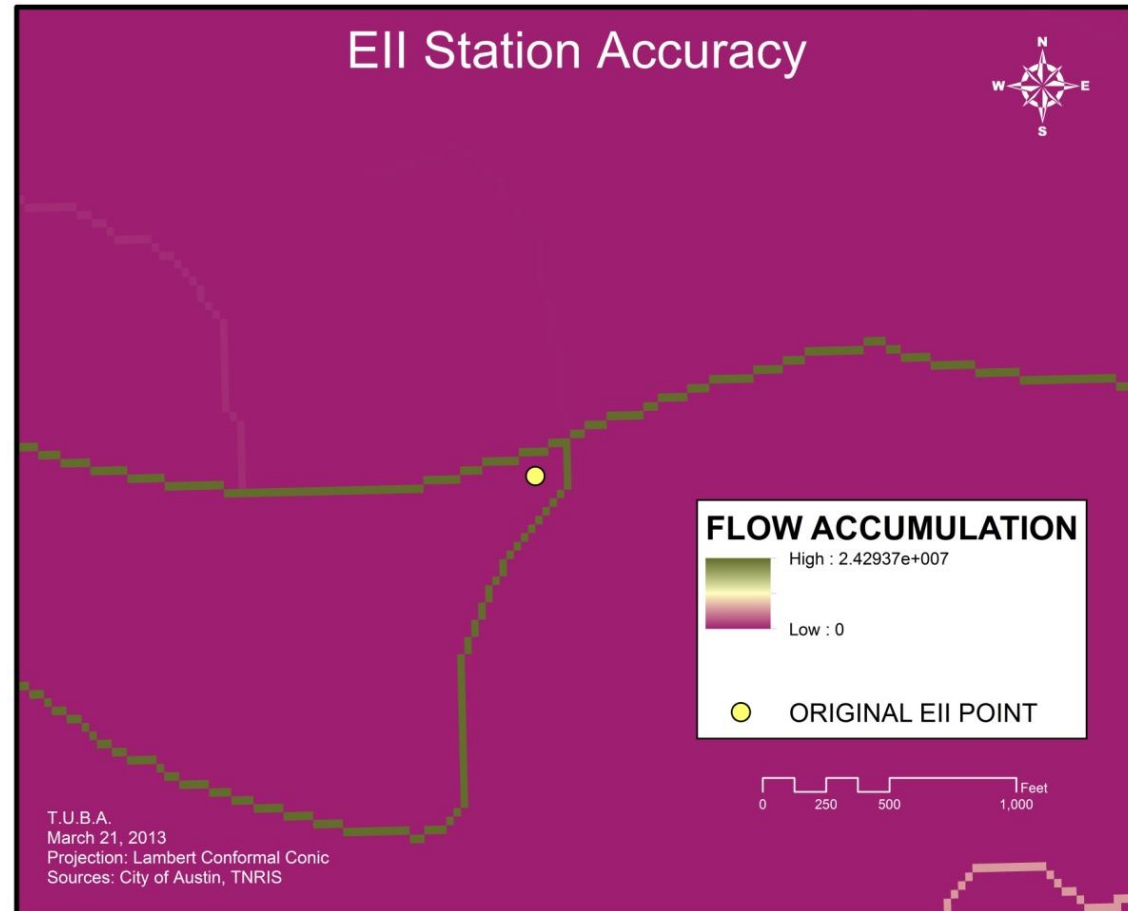
Pilot Project Output



Issues?

Verification of EII Points

- Discard raster values with < 300 upstream cells
- Convert raster layer to a vector layer to allow “snapping” of points

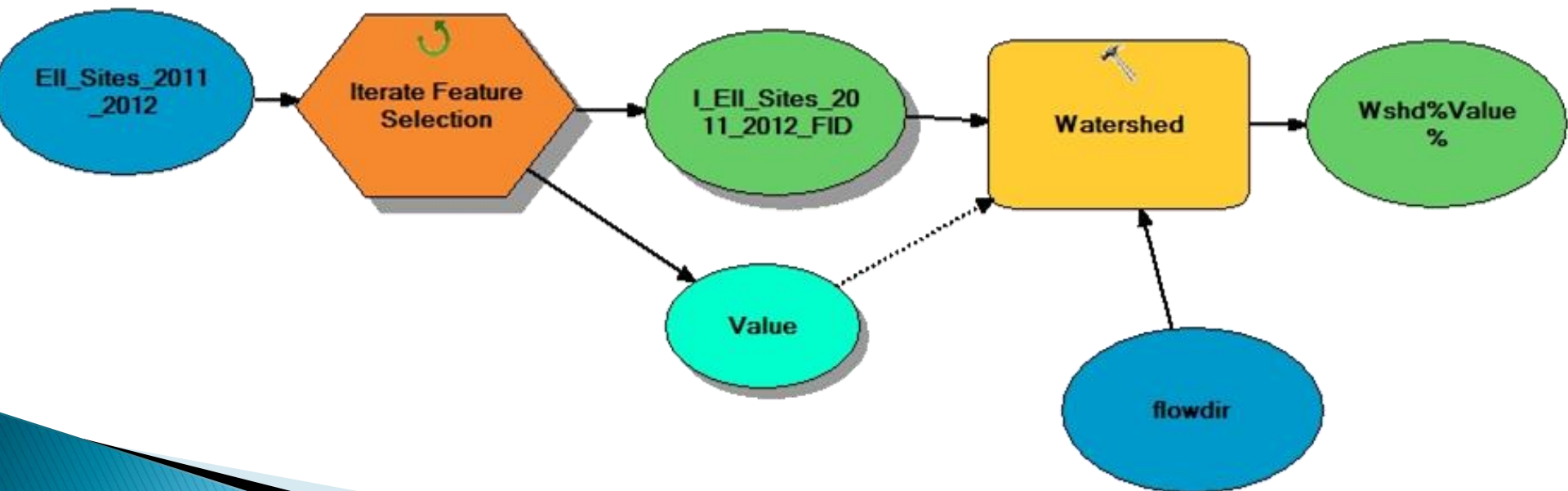


Verification of EII Points

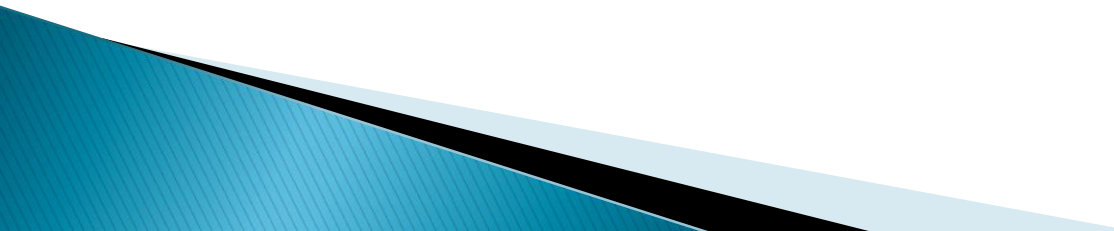
- No movement of points
 - ▶ Double-check points aren't still one cell off
 - ▶ Compare with satellite imagery in preparation for the next phase

Next Steps: Watershed Creation

- ▶ New model – uses Iterate Feature Selection tool to help create watersheds for each point



Next Steps: Tree Canopy Calculation

- ▶ Calculate percent of tree canopy cover using same method as pilot project
 - ▶ Some areas do not have the potential to grow trees (such as lakes)
 - ▶ These areas can be removed from watershed area calculations as time permits
 - ▶ Client suggestions for removal areas?
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Conclusion

- ▶ Final deliverables:
 - Replicable GIS model for creating watersheds and calculating tree canopy
 - Shapefiles with watersheds we created from each water quality sampling point
 - Calculated percentage of tree canopy in each of these watersheds
 - Final report