

# Comparisons Among Different Watershed Delineation Methods

GEOG 593  
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## Delineation Methods

- Unenhanced delineation
  - default settings
- Stream burning enhanced delineation
  - use separate stream network to “burn” channels
- Normalized excavation delineation
  - assign topographic minimum to stream “burn”
- Reconditioned (AGREE) delineation
  - stream “burn” with lowered surrounding area

# Delineation Methods

TABLE 1. AUTOMATED WATERSHED DELINEATION METHODS AND PARAMETERS

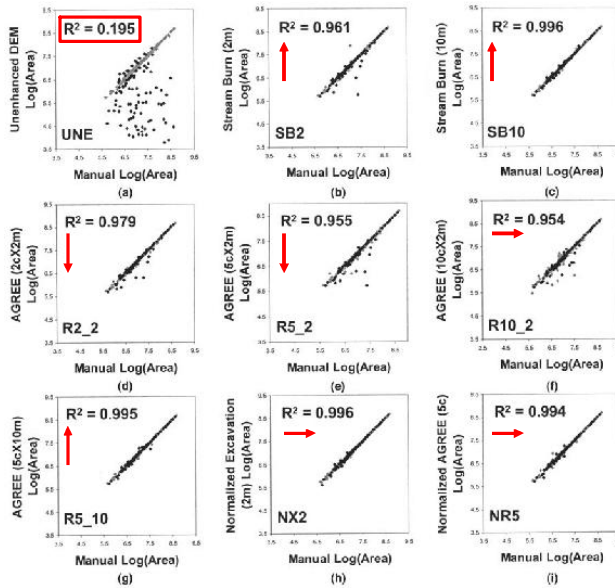
Method	Reconditioning Width (# 30-m cells)	Normalization Distance (m)	Excavation (Smooth Drop) Depth (m)	Code
Un-enhanced	*	*	*	UNE
Stream Burning	*	*	2	SB2
Normalized Excavation	*	150	(original elev-local min) + 2	NX 2
Reconditioning ( AGREE )	2	*	2	R2_2
Reconditioning ( AGREE )	5	*	2	R5_2
Reconditioning ( AGREE )	10	*	2	R10_2
Stream Burning	*	*	10	SB 10
Normalized Excavation	*	150	(original elev-local min) + 10	NX 10
Reconditioning	5	*	10	R5_10
Normalized Reconditioning	5	150	(original elev-local min)	NR5

# Delineation Methods

- Compare automated methods to manual digitized method

# Results

- Enhance methods are better for delineation than default automated approach
- Still some variability and concerns



# Discussion

- Problems with delineation
  - low gradient
  - irrigation
  - pore point alignment
  - sinks
  - introduced error
    - stream misalignment (parallel streams)
    - edge effects

## References

- Baker, M.E., Weller, D.E., and Jordan, T.E., 2006, Comparison of automated watershed delineations — Effects on land cover areas, percentages, and relationships to nutrient discharge: *Photogrammetric Engineering & Remote Sensing*, v.72, no. 2, p. 159-168.

## Questions

- What environments do errors commonly occur for automated delineations?  
**Low relief landscapes**
- What two factors would cause the largest discrepancies between the different automated delineation methods when compared to the manual delineation?  
**Incomplete/improper sink removal and pore point placement error**
- T/F. Enhanced delineation methods substantially reduced the number of large areal discrepancies with the manual watersheds, but the improvement was not consistent across methods.  
**True**
- T/F. Slight errors in mapping outlets from paper maps could result in large differences in the automated delineation of upslope drainage areas.  
**True**