

Fast flow accumulation

This project will improve the speed of flow accumulation.

Preliminary results

- Systems
 - Linux 4.14.39 with SSD and 16GB RAM on Yoga 370
 - ArcGIS on UNG Windows with SSD and 32GB RAM
- Data: Texas drain raster from [Efficient longest flow path algorithm](#)
- Benchmark algorithms from <https://github.com/zhouguiyun-uestc/FastFlow>

Program	Algorithm only (sec)	Total (sec)
FastFlow Zhou fdr.tif fac.tif	61	87
FastFlow Wang fdr.tif fac.tif	174	277
FastFlow Recursive fdr.tif fac.tif	178	204
FastFlow Jiang fdr.tif fac.tif	304	333
FastFlow BTI fdr.tif fac.tif	118	144
TauDEM aread8 -p taud8.tif -ad8 tauad8.tif	402	607
TauDEM mpiexec -n 2 aread8 -p taud8.tif -ad8 tauad8.tif	310	514
ArcGIS Flow Accumulation		478
Arc Hydro Flow Accumulation		681
Coming soon	48	107
Yet another coming soon	21	33

Discussion

Too much overhead for raster I/O. Need to reimplement I/O using [GDAL](#) or [from scratch](#)? Done using GDAL.

References

- [A fast and simple algorithm for calculating flow accumulation matrices from raster digital elevation models \(https://doi.org/10.1007/s11707-018-0725-9\)](https://doi.org/10.1007/s11707-018-0725-9)
- [Raster API tutorial](#)
- [TIFF - Image File Format](#)
- [Reading a Single TIFF Pixel Without Any TIFF Tools](#)

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