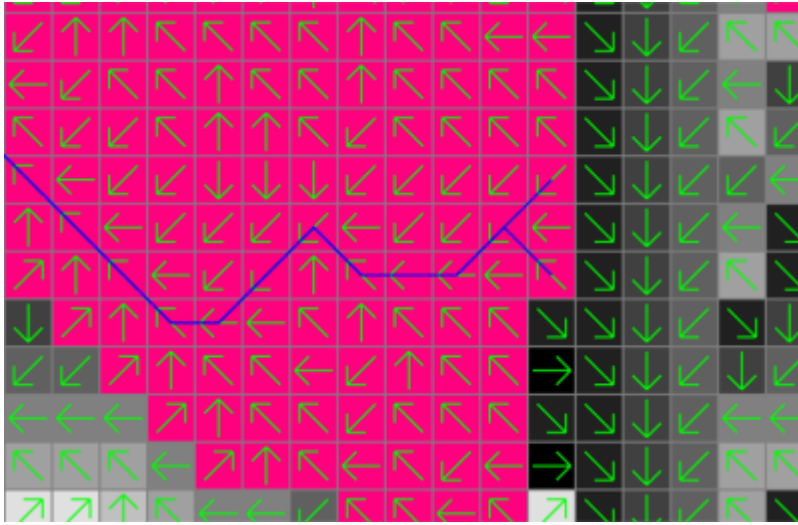


Efficient longest flow path algorithm

Workspace



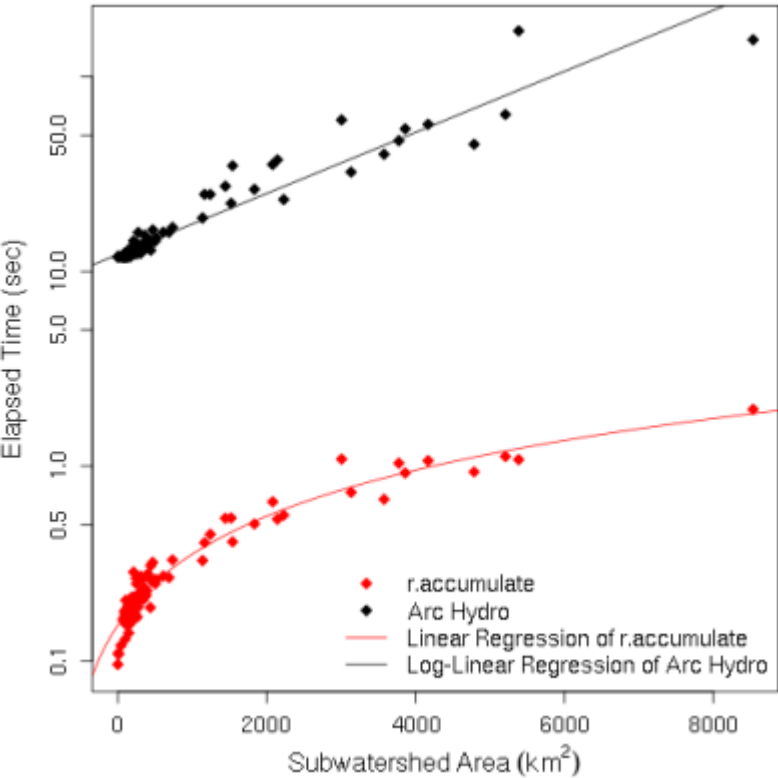
```
\[ \def\LFP{\overrightarrow{\text{LFP}}} \def\FP{\overrightarrow{\text{FP}}} \def\FL{\text{FL}}
\def\DFL{\text{DFL}} \def\UFL{\text{UFL}} \def\LFL{\text{LFL}} \]
```

A flow path FP_i is the watercourse between a pair of two points i within the watershed and the longest flow path LFP is defined as

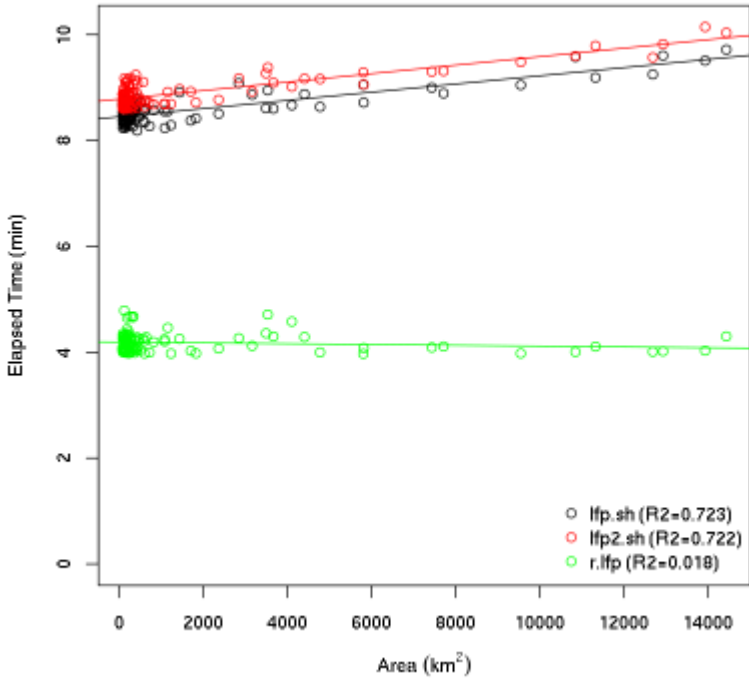
```
\[ \text{LFP} \in \left\{ \text{FP}_i; \left| \text{FP}_i \right| \geq \left| \text{FP}_j \right|; \text{for all } i \neq j \right\} . \]
```

The longest flow path plays an important role in hydrologic modeling, but its computation requires multi-step raster calculations for each watershed. This research project aims to improve the current process and efficiency of computing the longest flow path for a lot of watersheds.

Performance comparisons



Elapsed Time vs. Area



Method	lfp.sh	lfp2.sh	r.lfp	r.accumulate
Elapsed time	3h 48m	9h 8m	6h 46m	56s

References

- Huidae Cho, Accepted in June 2020. [A recursive algorithm for calculating the longest flow path](#)

and its iterative implementation. [Environmental Modelling & Software](#). SCIE, 2018 Impact Factor 4.552.

- [How to calculate the longest flow path in GRASS GIS](#)

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