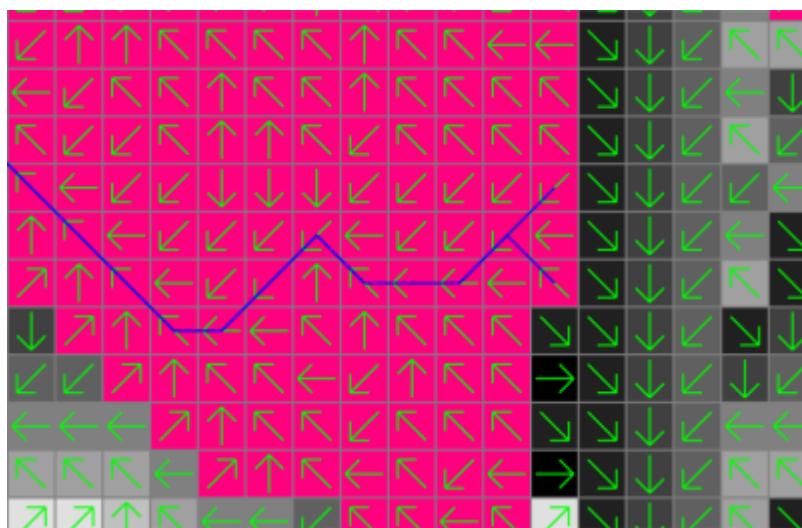


Efficient longest flow path algorithm

Workspace



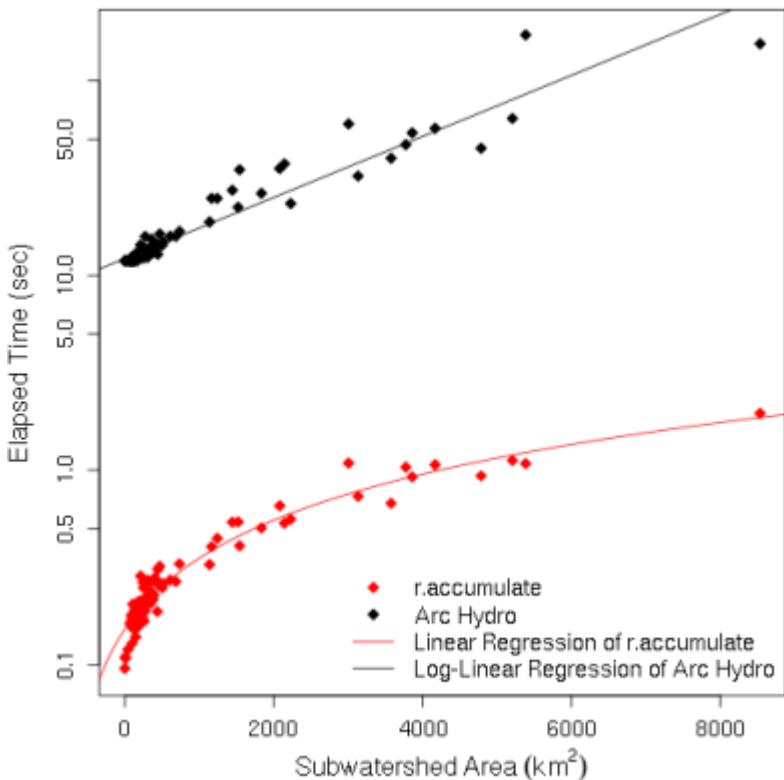
$\begin{aligned} & \text{\def\LFP{\overrightarrow{\text{LFP}}}} \text{\def\FP{\overrightarrow{\text{FP}}}} \text{\def\FL{\text{FL}}} \\ & \text{\def\DFL{\text{DFL}}} \text{\def\UFL{\text{UFL}}} \text{\def\LFL{\text{LFL}}} \end{aligned}$

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

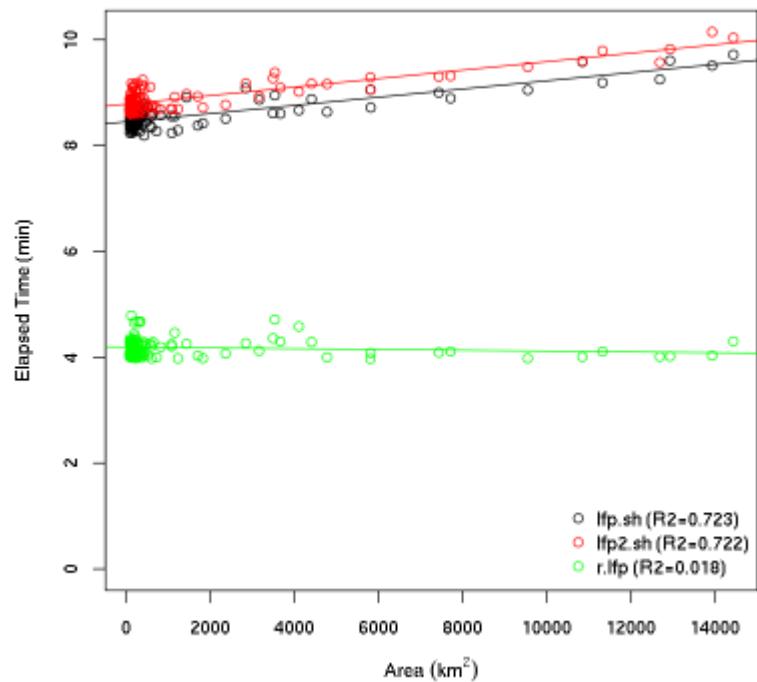
$\begin{aligned} & [\text{\LFP} \in \left\{ \text{\FP}_i \mid i \in \text{watershed} \right\} \mid \forall i \neq j \in \text{watershed} : \text{\FP}_i \leq \text{\FP}_j] \end{aligned}$

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.

projects

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