

FloodMAP and EA FRM Land Management Funding

Upland Hydrology Group Meeting

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FloodMAP

- ➔ Known peat restoration links at a local scale:
 - ➔ Biodiversity
 - ➔ Habitat protection
 - ➔ Carbon sequestration
 - ➔ Discolouration of water
 - ➔ Hydrology
- ➔ No evidence that these impacts scale up

FloodMAP

➔ Hydrological Benefits of Peat Restoration

- ➔ Flood risk: reduce and manage the risk, CFMP actions
- ➔ Water resources: CAMS
- ➔ Fisheries: reduce sediment into rivers, complies with WFD

➔ Links to EA Corporate Strategy and Vision

FloodMAP- Basic Aims

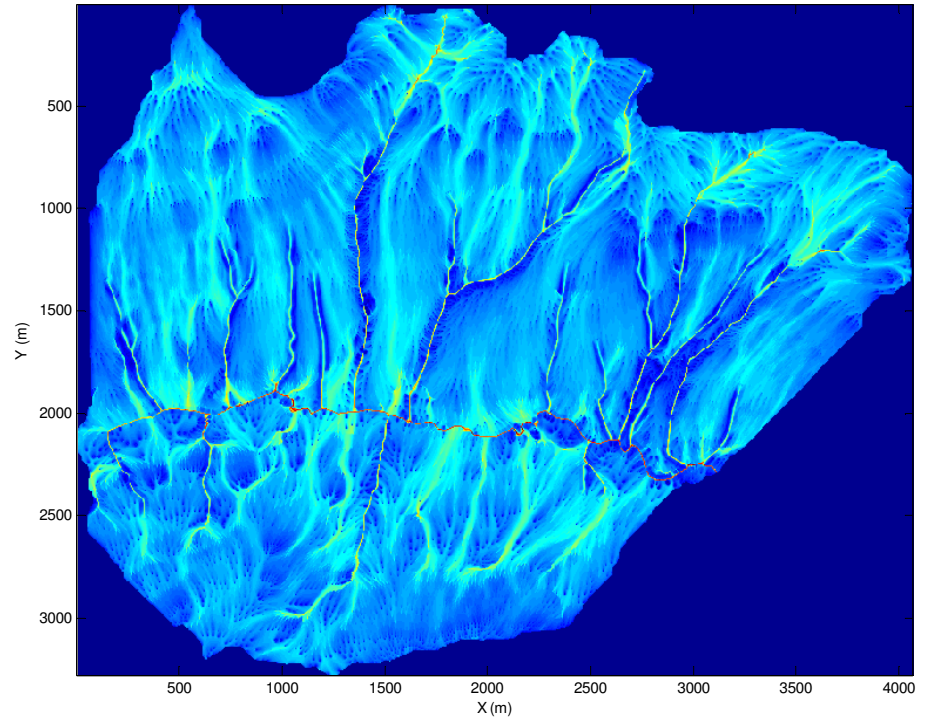
- ➔ To produce a model, to explore grip blocking effects on downstream flood risk
- ➔ To provide the model in a simple and easy to use format (SAGA GIS)
- ➔ To understand how the model behaves using a test catchment
- ➔ To assess whether or not grips impact on flood risk (and low flows)

FloodMAP- The model

- ➔ The model sits within SCIMAP
- ➔ Runs in SAGA GIS, a free GIS resource
- ➔ Trial catchment Oughtershaw, upper Wharfedale
- ➔ Assesses the time a pocket of water falling across a catchment takes to reach the outlet
- ➔ Grips then added and run again
- ➔ Two modelled hydrographs showing the difference between gripped and ungripped

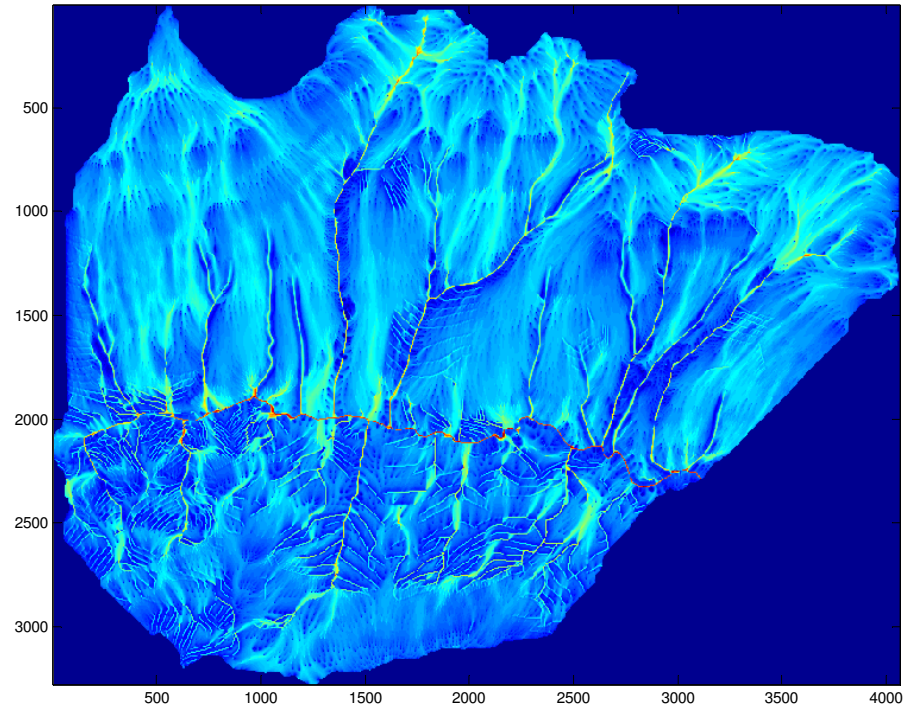
FloodMAP- The outputs

- ➔ Estimated topographic index without grips (blue dry to red wet)



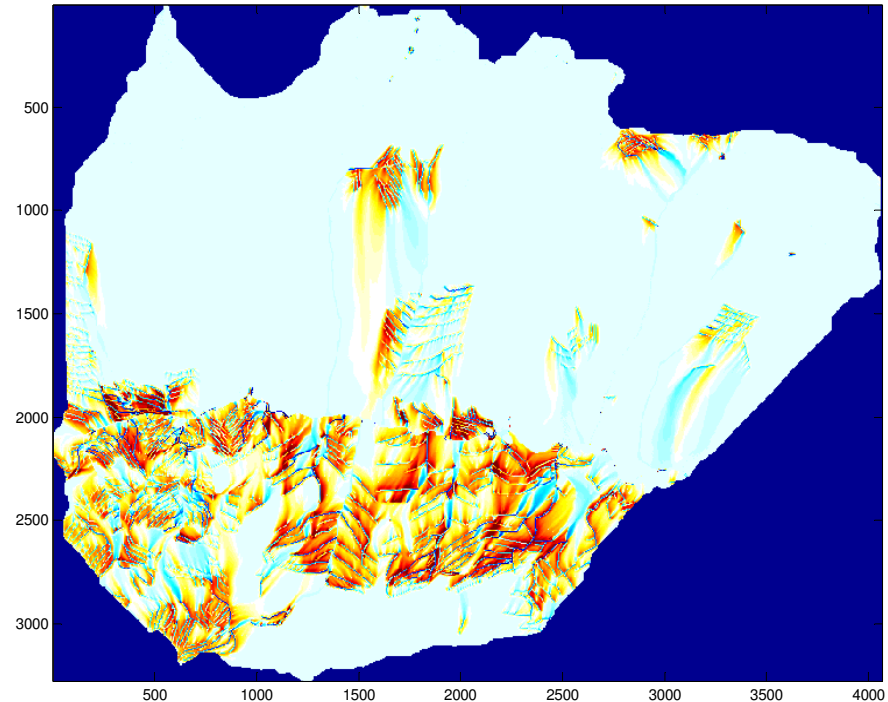
FloodMAP- The outputs

- ➔ Estimated topographic index with grips (blue dry to red wet)



FloodMAP- The outputs

- ➔ Associated change in topographic index based on soil moisture changes (red drying, blue wetting)



FloodMAP- Data and IT requirements

Datasets:

1. Rainfall [hourly]
2. Discharge [hourly] - calibration or checking
3. Topography [< 3 m precision <10 m resolution]
4. Grip network - as a vector shapefile or binary grid

Model Versions:

1. MATLAB – for development; flexible for multiple runs but command line driven and requires 3rd party software. Pre-processing in SAGA.
2. SAGA – for release; free, open source GIS package, fairly intuitive and already familiar to rivers trust.

System Requirements: v low spec, runs on standard 32 bit windows PC

FloodMAP- Conclusions

- ⇒ In this catchment, with the grip network, using this model
 - ⇒ Dominant effect of blocking grips at the catchment-scale in relation to flood risk, is to reduce catchment storage and so increase rapid runoff generation
 - ⇒ Grips have converted peat into well-drained soils
 - ⇒ Counteracting effect of slowing the flow is comparatively small, primarily because it has a temporally restricted effect
 - ⇒ But blocking of individual grips, if targeted sensibly, may have some beneficial effects
- ⇒ Generalising results from this modelled catchment to other catchments must be undertaken with caution as other kinds of grip network may produce varying results

FloodMAP- Limitations and Future Developments

- ➔ Grips are either blocked or unblocked
- ➔ Groundwater issues
- ➔ Gullies
- ➔ Data, worked examples

EA FRM Land Management Funding

- ➔ Land Management funding is difficult to attain!
- ➔ “Land Management” doesn’t just mean upland land management
- ➔ Corporate Strategy looks to achieve FCRM benefits. Land management is **one solution** that will enable those benefits to be realised

So what can we do.....

EA FRM Land Management Funding

- ➔ What does the CFMP say?
 - ➔ Is there evidence to back up proposal?
 - ➔ Are there multiple benefits?
 - ➔ Could the work be done in collaboration?
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- ➔ WFD funding
 - ➔ Green Infrastructure
 - ➔ Local Levy