

Your IP3 basin in MESH

F. Seglenieks and Dr. E.D. Soulis
Civil Engineering Hydrology Lab
University of Waterloo, Waterloo, ON



Modelling Philosophy IP3

Research basins were at different level of modelling at beginning of IP3

Goal was to get all research basins to the same level

Start by setting up model on 1 grid square – 1 GRU basecase for all basins (ie. Use data from single met station)

Get initial streamflow results using a generic parameter set for all basins (runs shown here use MESH 1.0.0h)



Modelling Philosophy IP3

This allowed for initial contact with field personnel from research basins

Find out the data that is available, perhaps suggest others
Some basins (Scotty, Wolf, Trail Valley) are more developed



Modelling Philosophy IP3

Teams of modellers working with field personnel of each research basin to develop detailed modelling

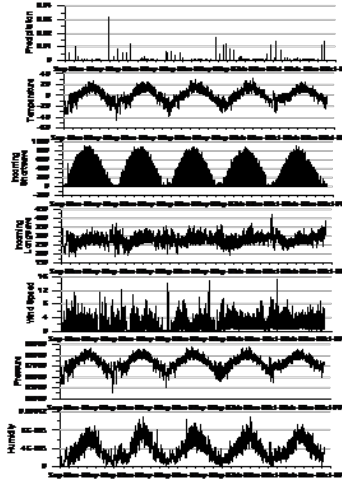
We have been doing this with Bill Quinton on the Scotty Creek research basin

We recommend following the same path with other research basins

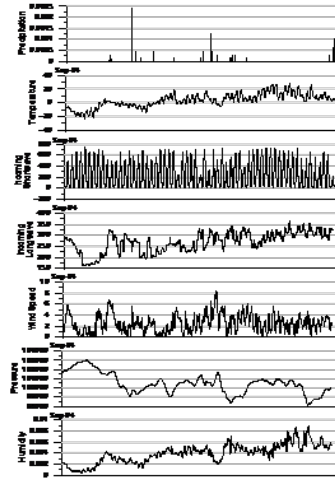


Input met data

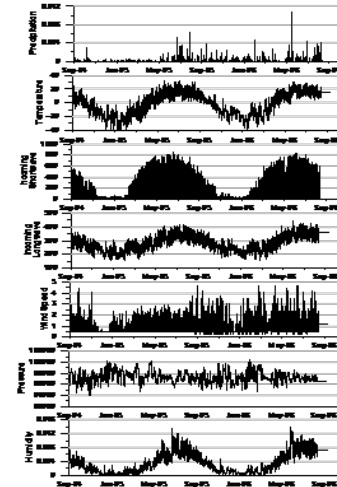
Wolf



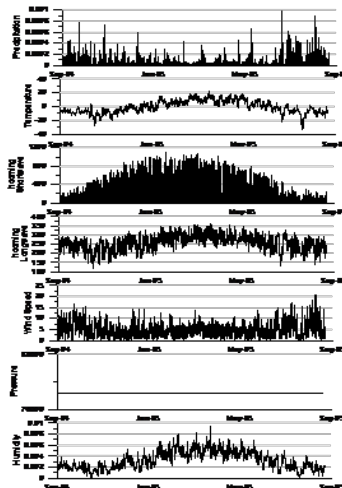
Trail



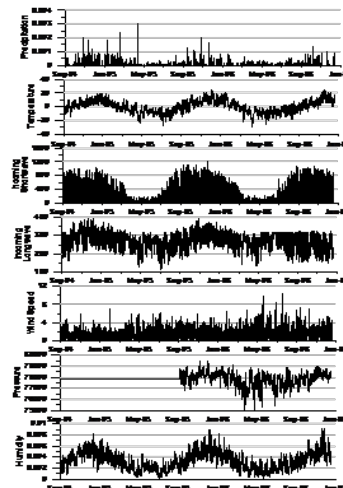
Scotty



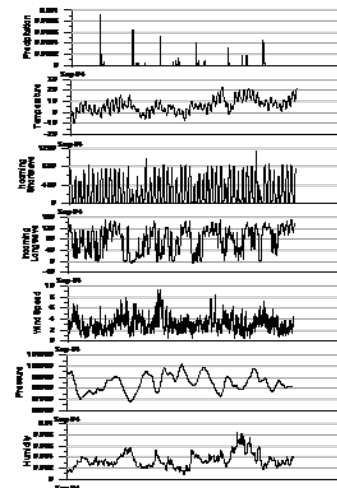
Peyto



O'hara



Baker



Wolf Creek (Pomeroy)

Meteorological data

Start 1996 01 01 - End 2000 12 31

Streamflow data

Start 1996 01 01 - End 2000 12 31

Grid resolutions

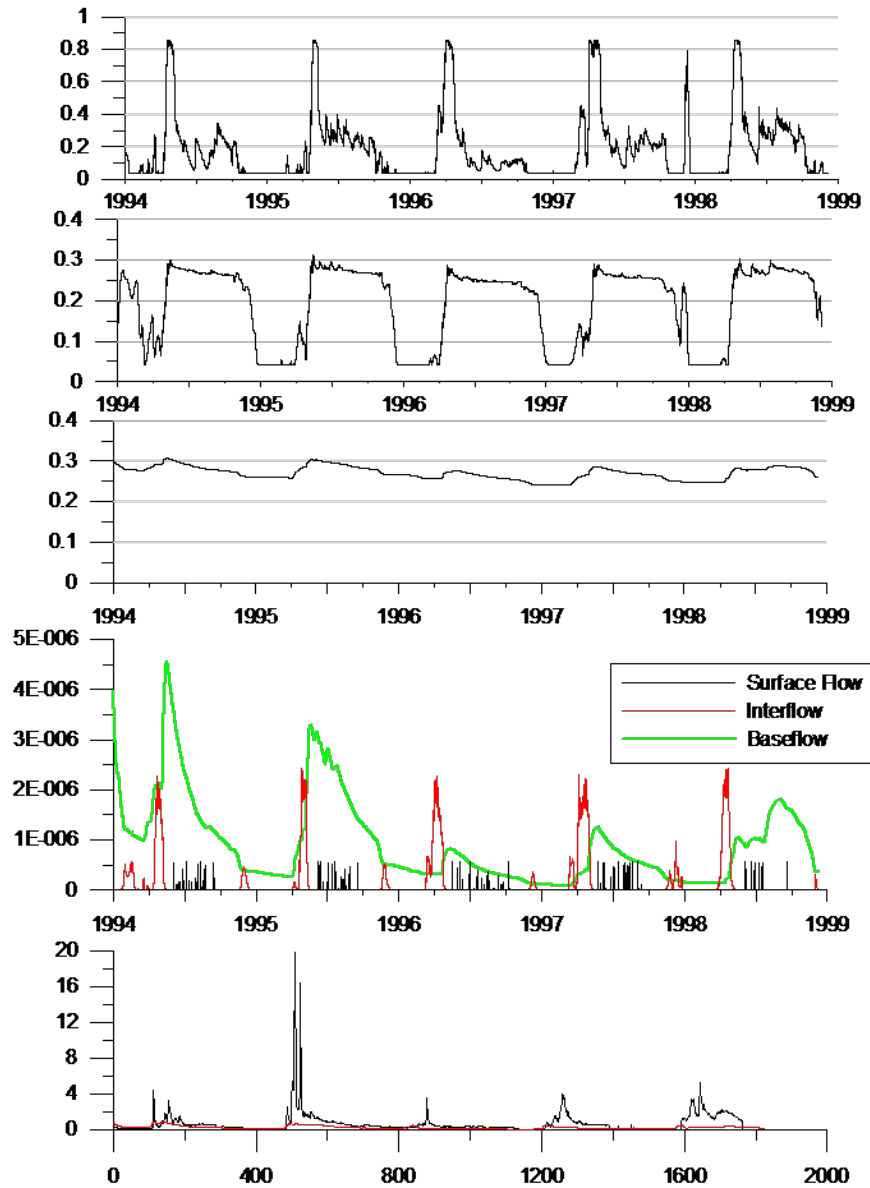
- basecase
- 1 km

GRU (Land cover)

- basecase
- Tundra, backbrush, aspen forest, black spruce forest, black spruce/buckbrush mix, rock outcrop, permanent snowdrift, water



Wolf Creek



Trail Valley Creek (Marsh)

Meteorological data

Start 1996 05 01 - End 1996 06 30

Streamflow data

Start 1996 05 01 - End 1996 06 30

Grid resolutions

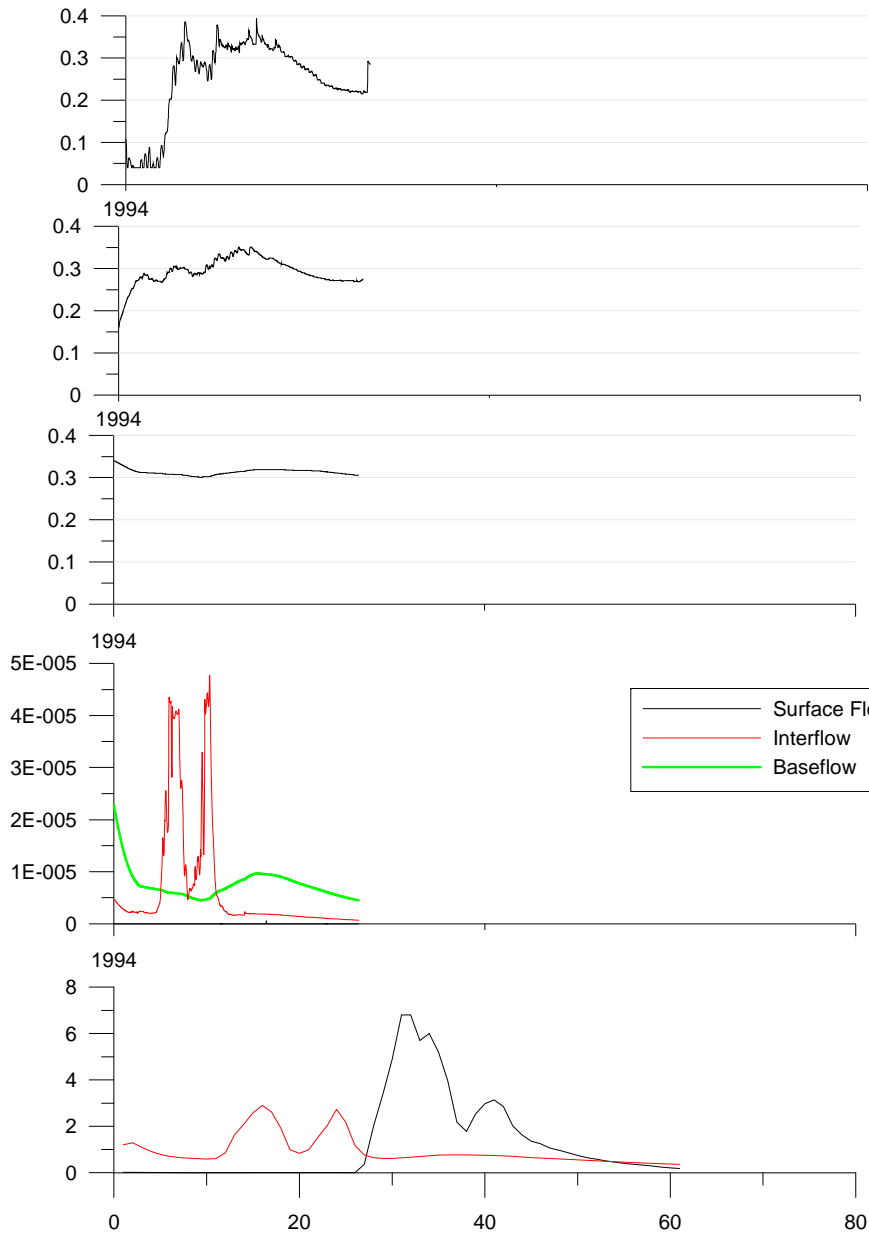
- basecase
- 1 km

GRU (Land cover)

- basecase
- Open tundra, wind swept tundra, shrub tundra, drifts, forest, water



Trail Valley Creek



Baker Creek (Spence)

Meteorological data

Start 2007 04 22 - End 2007 06 12

Streamflow data

None

Grid resolutions

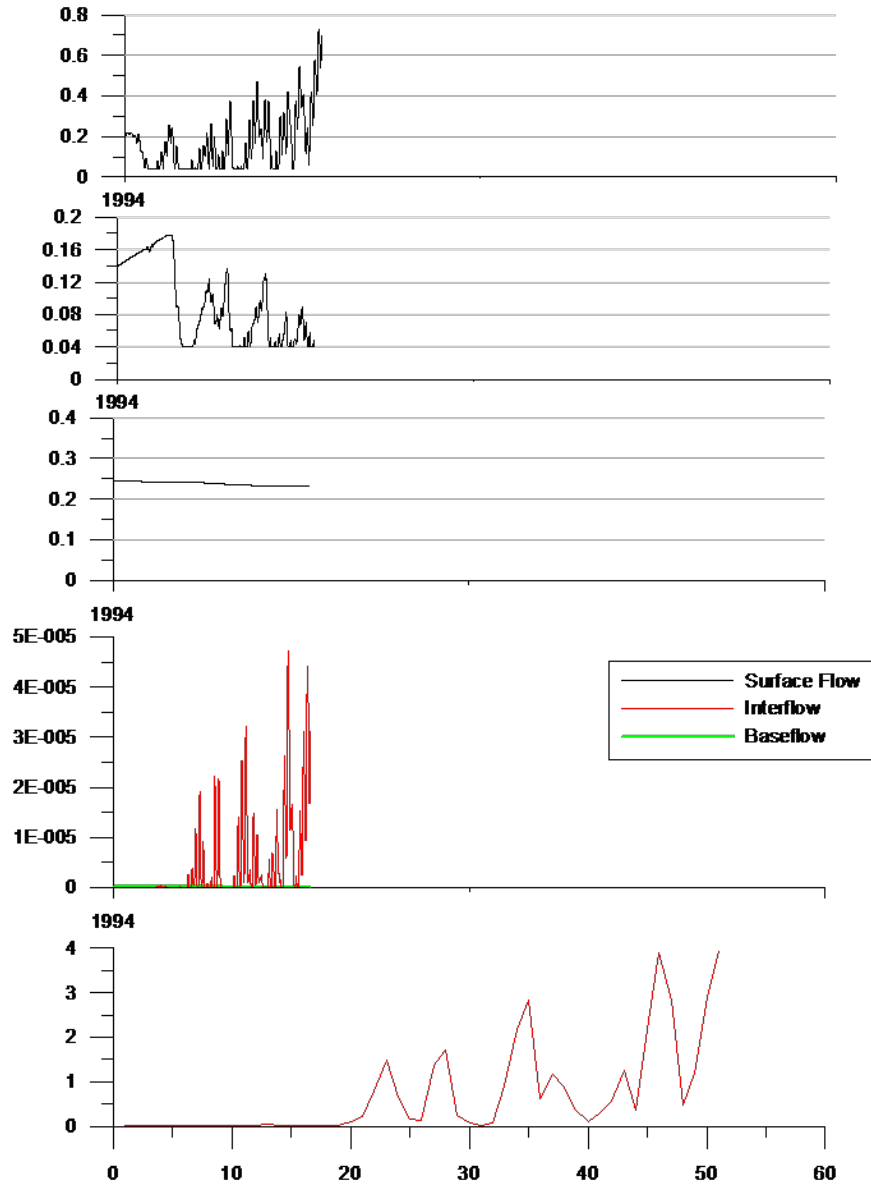
- basecase

GRU (Land cover)

- basecase



Baker Creek



Peyto Creek (Monroe)

Meteorological data

Start 2006 01 01 - End 2006 12 31

Streamflow data

None

Grid resolutions

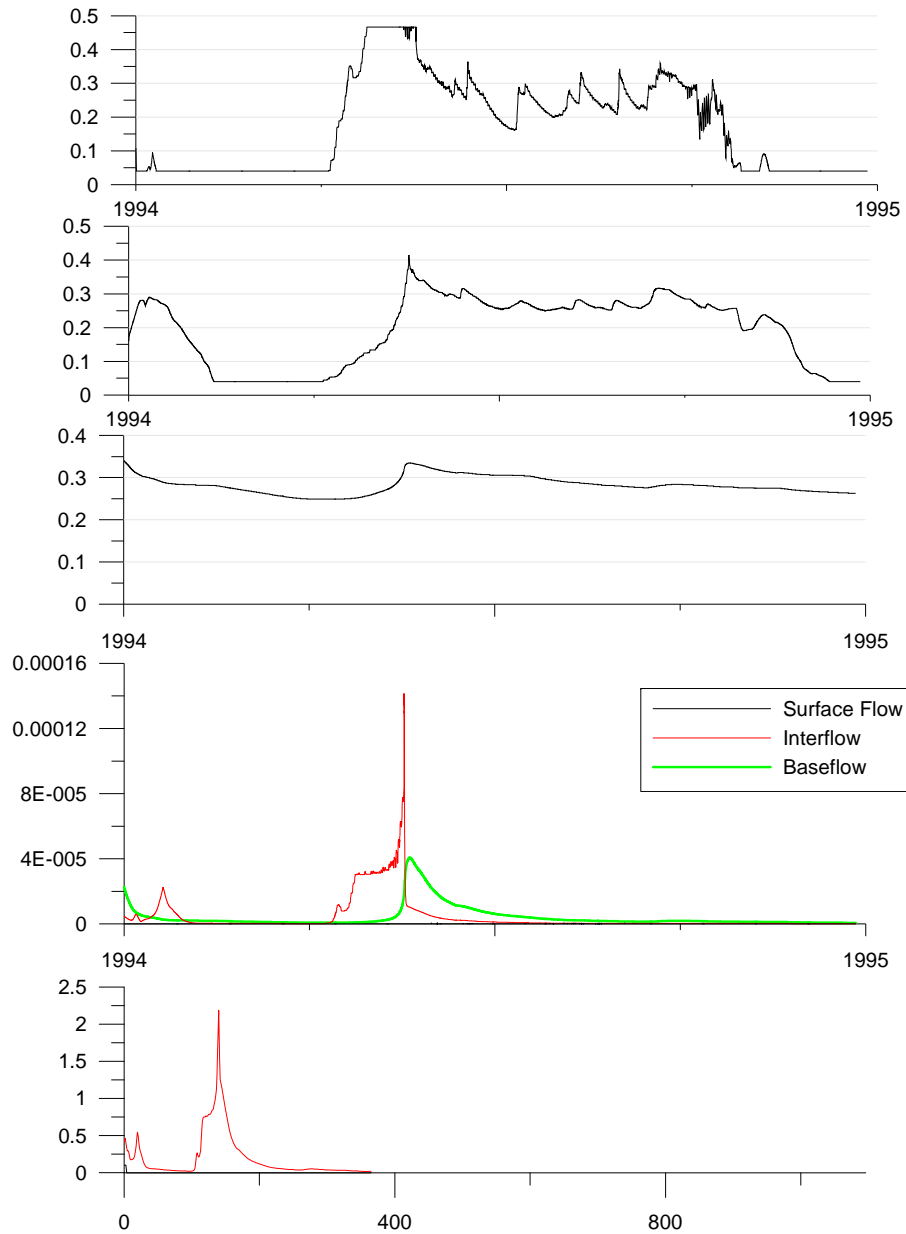
- basecase

GRU (Land cover)

- basecase



Peyto Creek



Lake O'Hara (Hayashi)

Meteorological data

Start 2005 04 06 - End 2007 08 16

Streamflow data

Start 2005 04 06 - End 2006 10 15

Grid resolutions

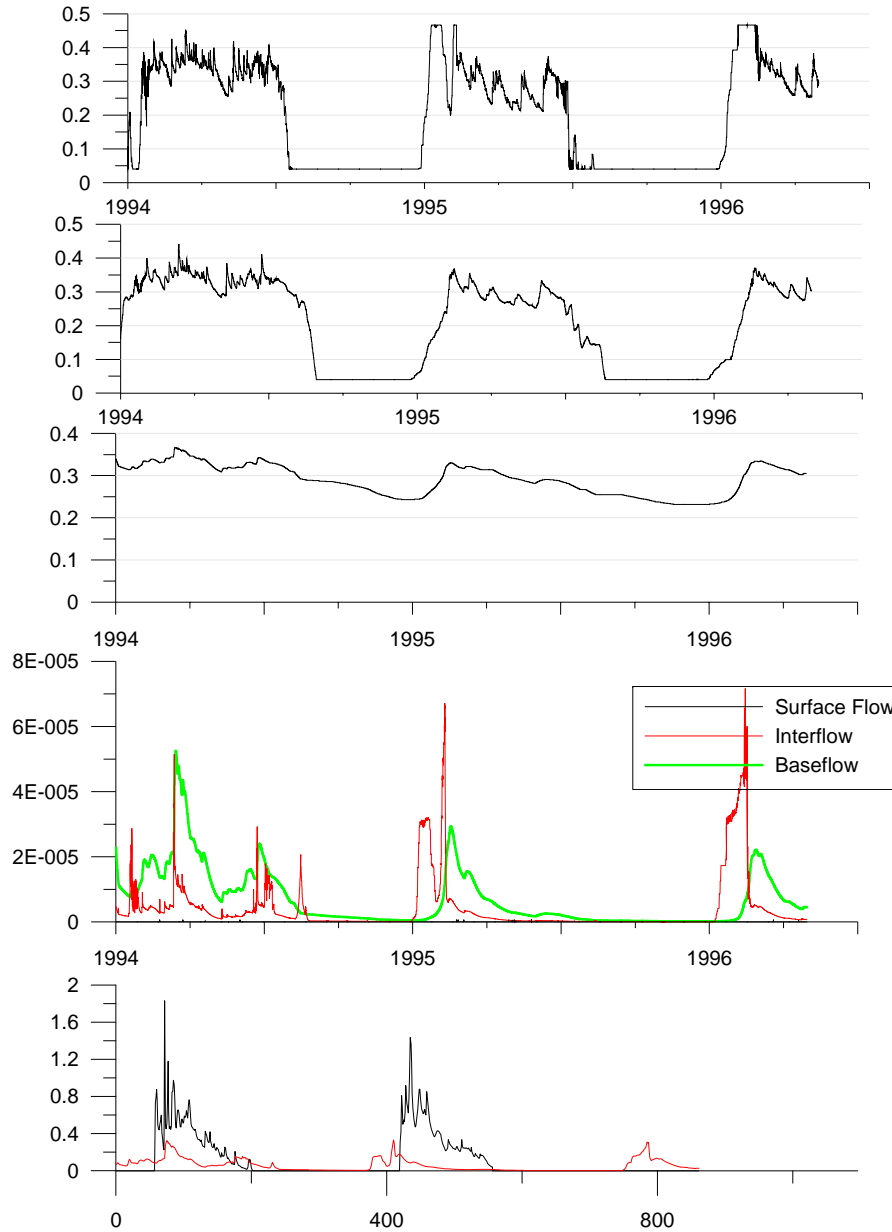
- basecase

GRU (Land cover)

- basecase



Lake O'Hara



Scotty Creek (Quinton)

Meteorological data

Start 2004 09 01 - End 2007 08 12

Streamflow data

Start 2004 09 01 - End 2006 12 31

Grid resolutions

- basecase

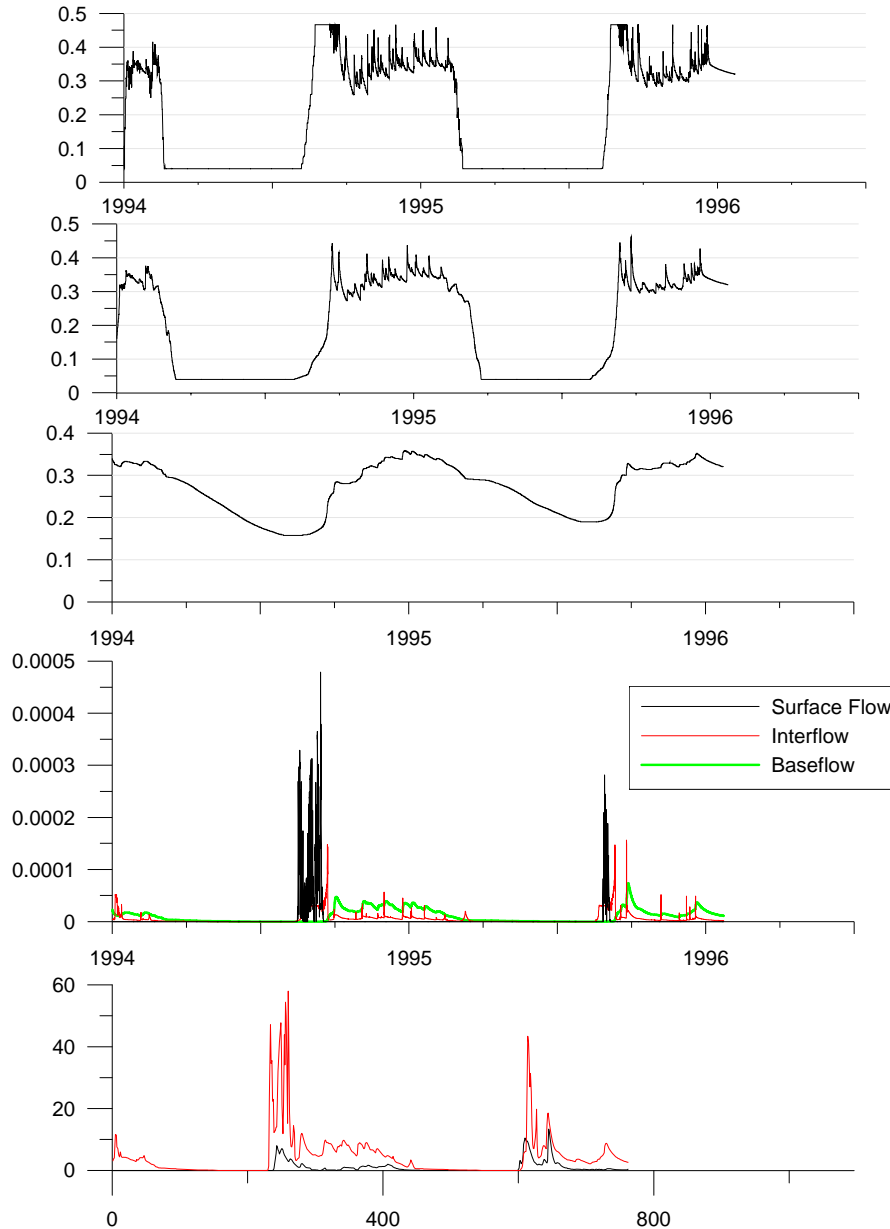
GRU (Land cover)

- basecase

- channel fen, peat plateau

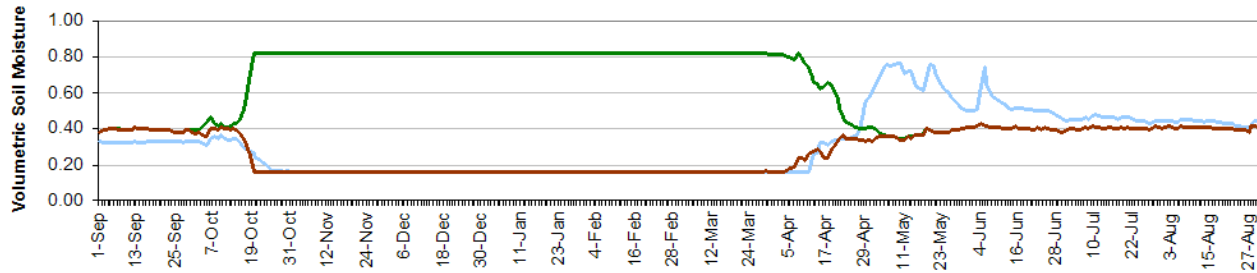


Scotty Creek

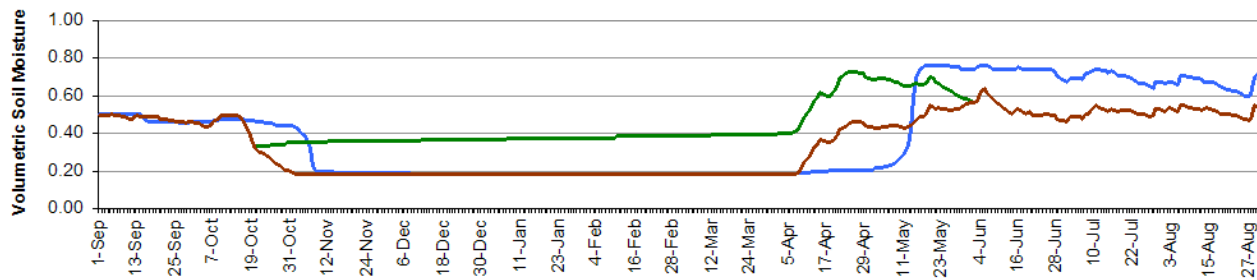


Modelled vs. Measured Soil Moisture after Calibration (2004-2005)

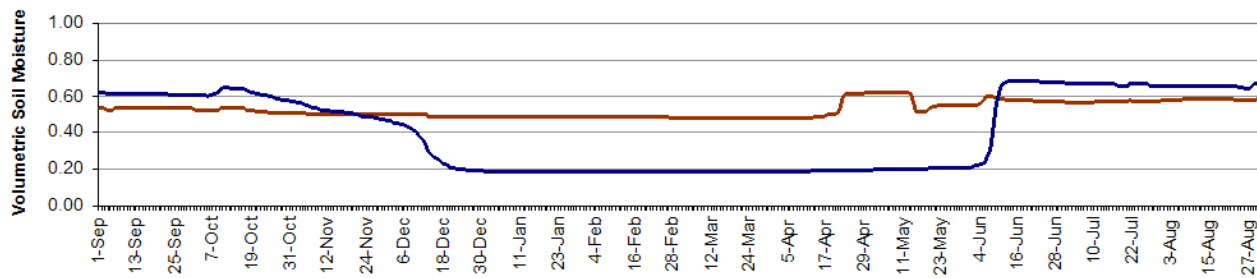
Layer 1 - 0-10 cm



Layer 2 - 10-35 cm



Layer 3 - 35-42 cm

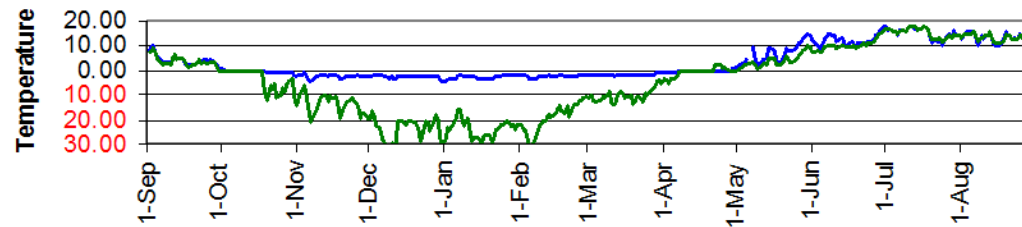


— Liquid Water Content — Total Water Content — Measured, 10cm — Measured, 20cm — Measured, 40 cm

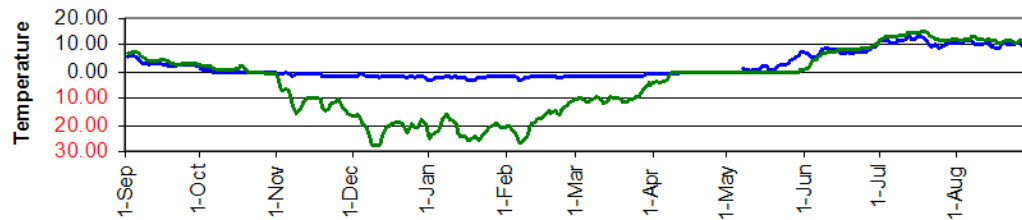


Modelled vs. Measured Soil Temperature after Calibration (2004-2005)

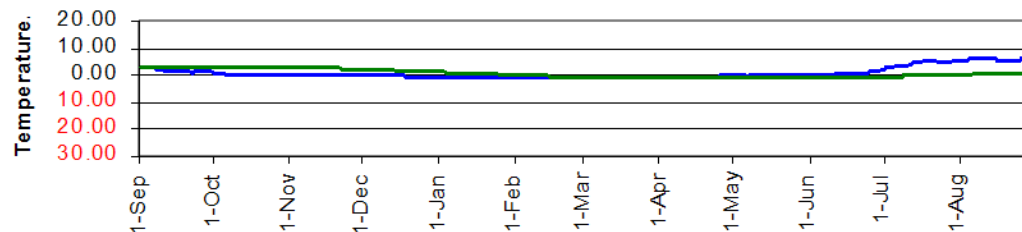
Layer 1



Layer 2



Layer 3



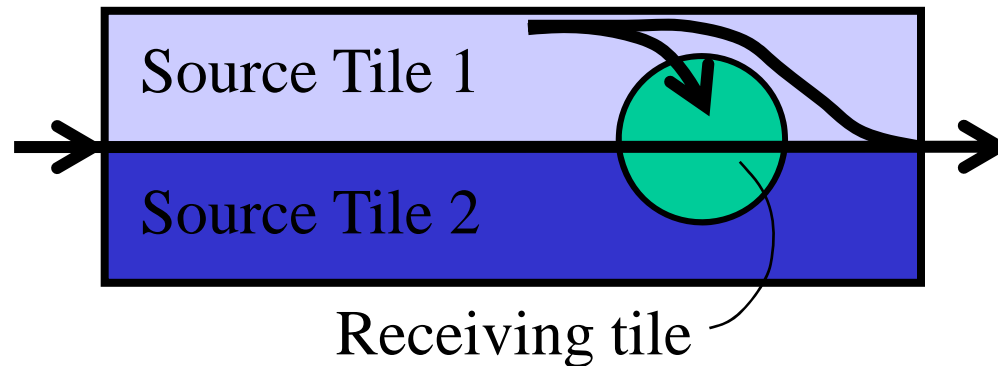
— Measured — Modelled



Possible next steps on Scotty: tile connector

- uses a tile connector to allow transfer of runoff between peat plateau and fens, and peat plateaus and isolated bogs
- can have one receiving class and two source classes
- transfer is based on the square-root of the ratio of the area of the receiving land class divided by that of the source land class

Grid element with tile diversion



Next steps

Make all files (MESH executable, basin files) available to all researchers via the IP3 ftp site

Apply 1 km grid square to all basins:

Need to obtain DEMs for each basin

Have to decide how to interpolate data

Get more than just Met data for each research basin (ie. Soil moisture, soil temperature, ET, snow information, etc.)



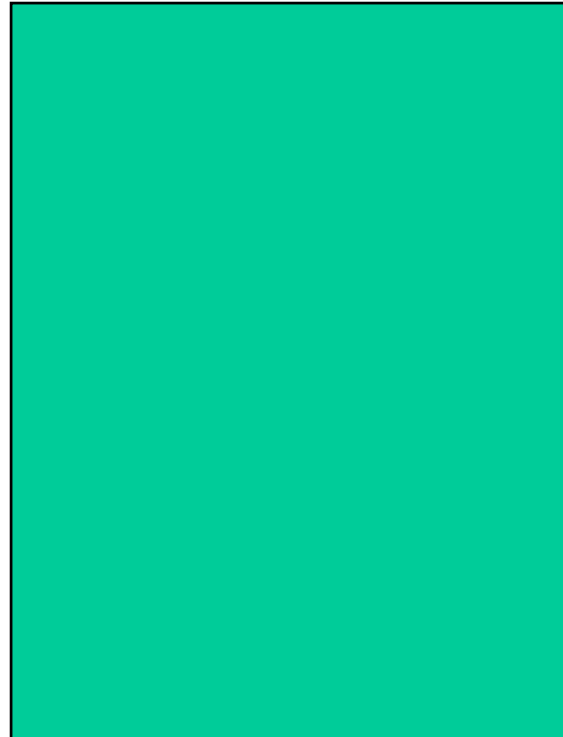
How process people the research basins



How process people the research basins



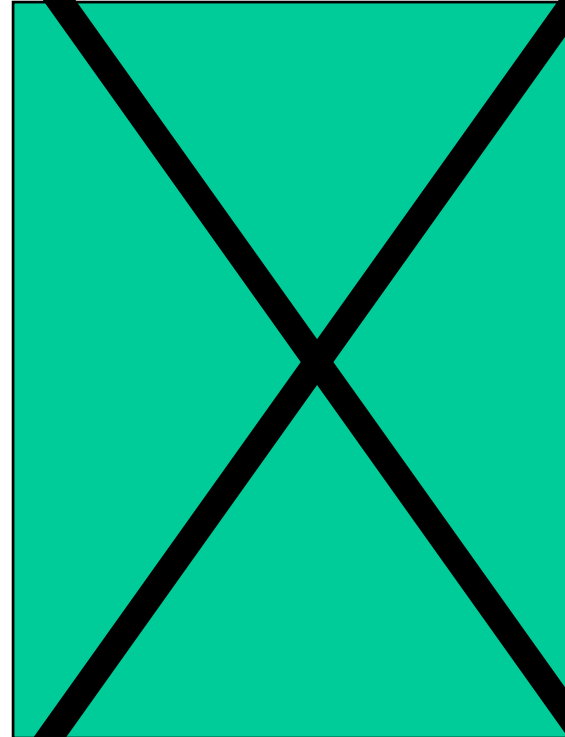
How modellers see the research basins



How process people the research basins



How modellers see the research basins



With your help we can do much better!

Questions?

