

## General Information

|                |              |                                   |              |
|----------------|--------------|-----------------------------------|--------------|
| River Name     | Kielder Burn | Catchment Area (km <sup>2</sup> ) | 59           |
| Station Name   | Kielder      | SAAR (mm) 61-90                   | 1199         |
| Station Number | 23011        | Mean Annual Rain (mm) 62-91       | 1207         |
| Grid Reference | NY644946     | Mean Annual PE (mm) 62-91         | 488          |
| EA Region      | EA-NE        | Observed flow record              | 1970 to 2005 |



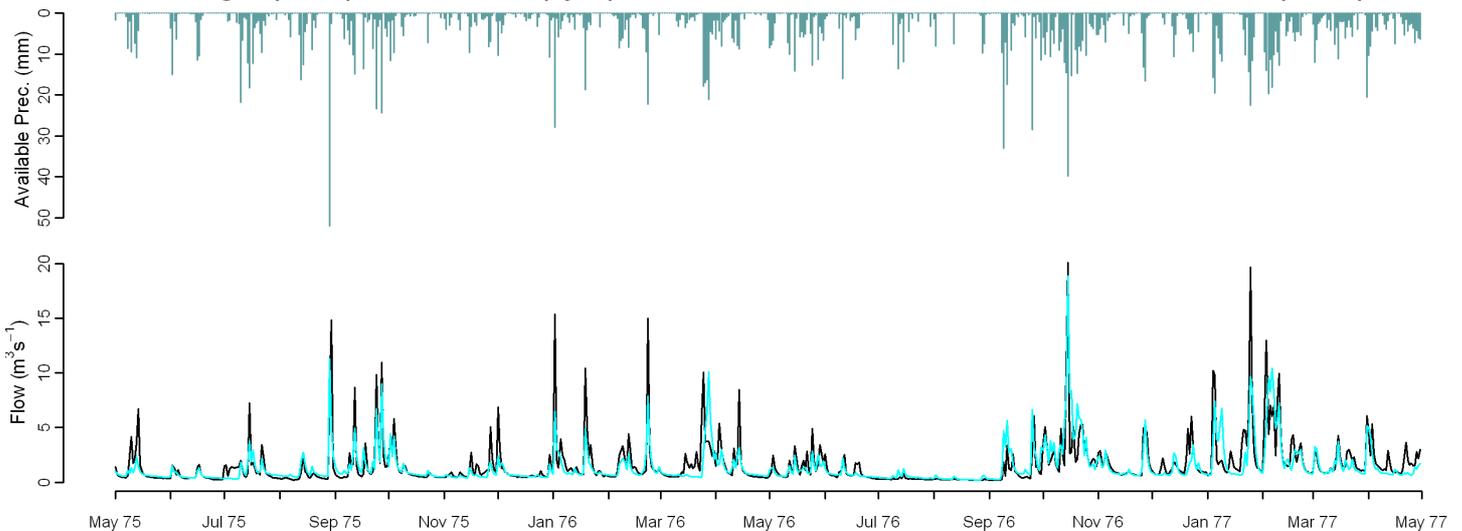
## Observed Data

## Comparison of gauged and simulated flow

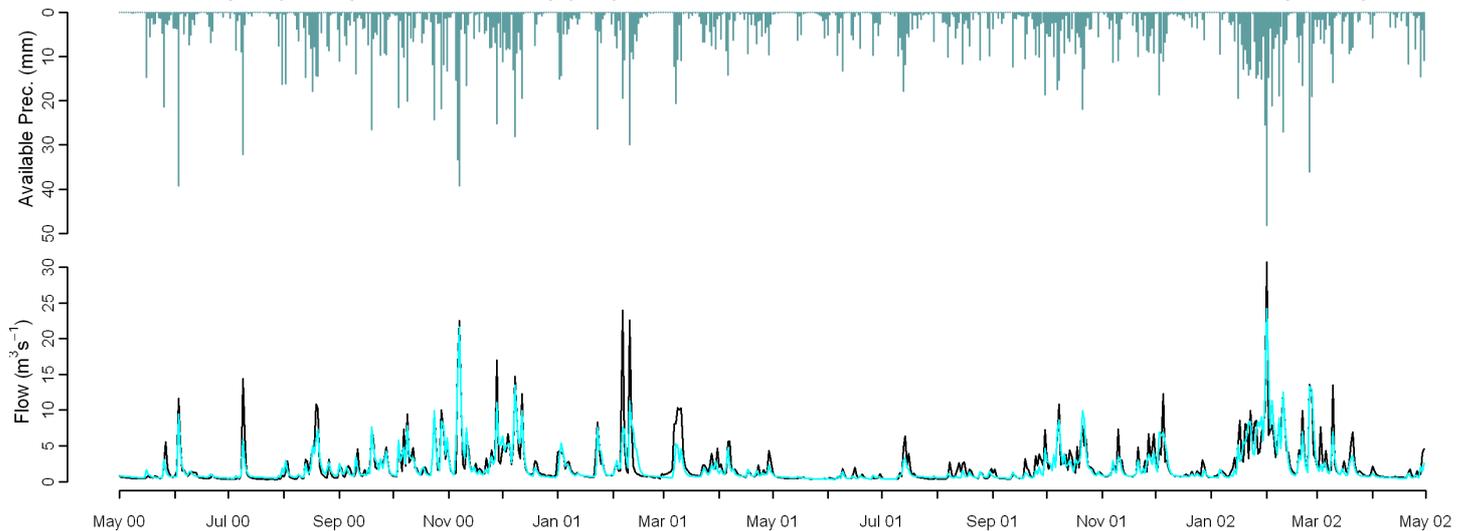
## Model used: CERF

|                    | Mean Annual | J     | F     | M     | A     | M     | J     | J    | A    | S    | O    | N    | D    | Nash Sutcliffe |
|--------------------|-------------|-------|-------|-------|-------|-------|-------|------|------|------|------|------|------|----------------|
| MORECS (1971-2005) | -10.2       | -12.9 | -7.3  | -18.2 | -17.3 | -18.5 | -13.8 | -7.2 | -6.0 | -5.0 | -2.0 | -7.4 | -8.0 | 0.67           |
| Performance Band   | 2           | 2     | 2     | 2     | 2     | 2     | 2     | 1    | 2    | 1    | 2    | 1    | 1    | 1              |
| MORECS (1962-1991) | -12.1       | -17.0 | -11.8 | -16.9 | -20.3 | -21.5 | -15.4 | -5.0 | -3.4 | -3.5 | -5.6 | -7.6 | -9.3 | 0.65           |
|                    | Q90         | Q75   | Q50   | Q25   | Q5    | RP2   |       | RP5  |      | RP10 |      | RP20 |      |                |
| MORECS (1971-2005) | 18.7        | 13.0  | -12.7 | -13.1 | -10.8 |       |       |      |      |      |      |      |      |                |
| Performance Band   | 1           | 1     | 1     | 1     | 1     |       |       |      |      |      |      |      |      |                |
| MORECS (1962-1991) | 19.4        | 14.7  | -11.5 | -14.5 | -15.4 |       |       |      |      |      |      |      |      |                |

Gauged (black) and simulated (cyan) flows from observed climate - Kielder Burn at Kielder (23011)

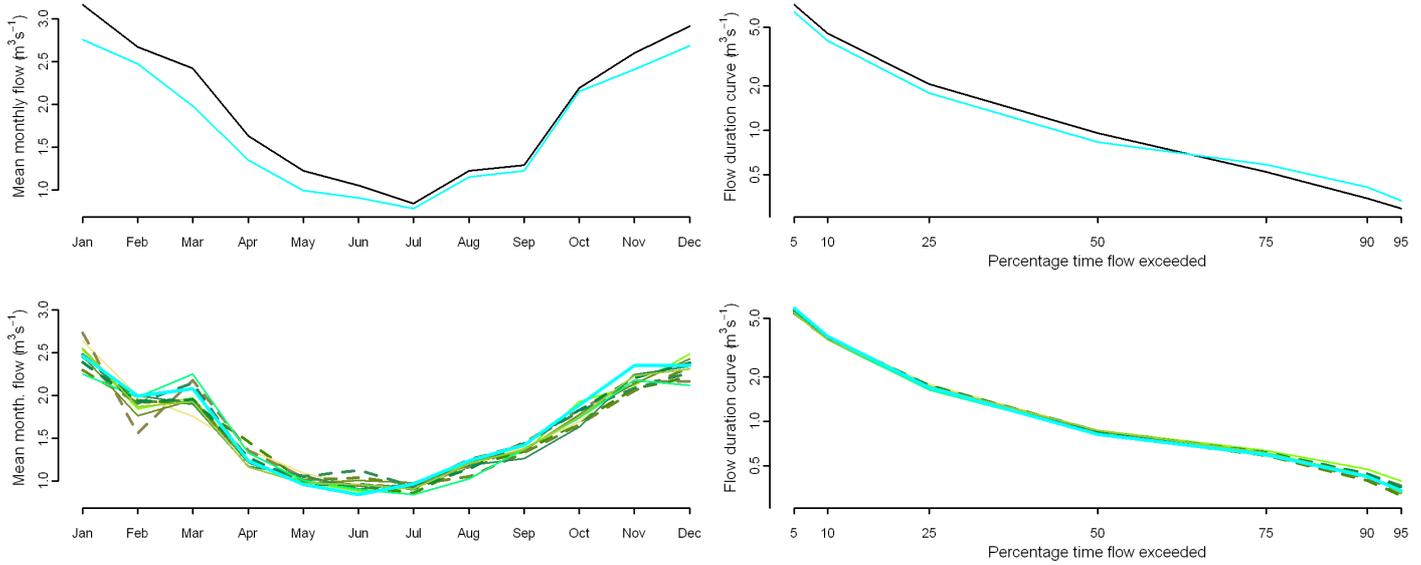


Gauged (black) and simulated (cyan) flows from observed climate - Kielder Burn at Kielder (23011)



## Comparison of gauged and simulated flow (observed and modelled climate)

Gauged (black), simulated from obs. (cyan) and mod. (green) climate - Top 1971-2005 bottom 1962-1991 - Kielder Burn at Kielder (23011)



## Percentage difference between flow simulated from observed climate and Future Flows Climate

|         | afgcx | afixa | afixc | afixh | afixi | afixj | afixk | afixl | afixm | afixo | afixq |
|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Annual  | 0     | -2    | 0     | 2     | -2    | -2    | -3    | 2     | -3    | -1    | -3    |
| January | 3     | -3    | 7     | 9     | 0     | -2    | -3    | 2     | -9    | -6    | 8     |
| April   | 0     | 8     | 14    | 15    | -1    | -2    | -4    | 3     | 5     | 7     | -5    |
| July    | -1    | -1    | -4    | 0     | 1     | -3    | 0     | -2    | -9    | -8    | -5    |
| October | 2     | -6    | -11   | 0     | -4    | -9    | -1    | -5    | -6    | -1    | -7    |
| Q90     | 13    | -4    | 2     | 5     | -2    | -3    | -2    | 4     | -1    | 1     | 2     |
| Q75     | 7     | 0     | 3     | 4     | 1     | -1    | 1     | 4     | -2    | 2     | 3     |
| Q50     | 7     | 3     | 6     | 6     | 4     | 2     | 5     | 5     | 1     | 4     | 5     |
| Q25     | 3     | 0     | 4     | 2     | -1    | 0     | 1     | 5     | -3    | 2     | 1     |
| Q5      | -4    | -6    | -3    | -2    | -7    | -6    | -6    | 2     | -6    | -2    | -9    |
| RP2     | -4    | 1     | -4    | 7     | 1     | -2    | -4    | 4     | 4     | -1    | 0     |
| RP10    | -12   | -9    | -16   | 2     | 2     | -10   | -16   | -1    | -9    | -6    | -2    |

## Climate change graphs for 2050s

Change between future (2040-2069) and control (1961-1990) simulated flow (green) - Kielder Burn at Kielder (23011)

