Adaptation of the Meuse to the Impacts of Climate Evolutions

This project has received European Regional Development Funding through INTERREG IV B.

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Joint approach to climate change adaptation in the Meuse basin

AMICE project

maite.fournier@epama.fr

UNECE Workshop – Geneva – 10-11 May 2010

London
Paris
Geneva

905 km

350 m3/s

9 million inhab.

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NETHERLANDS

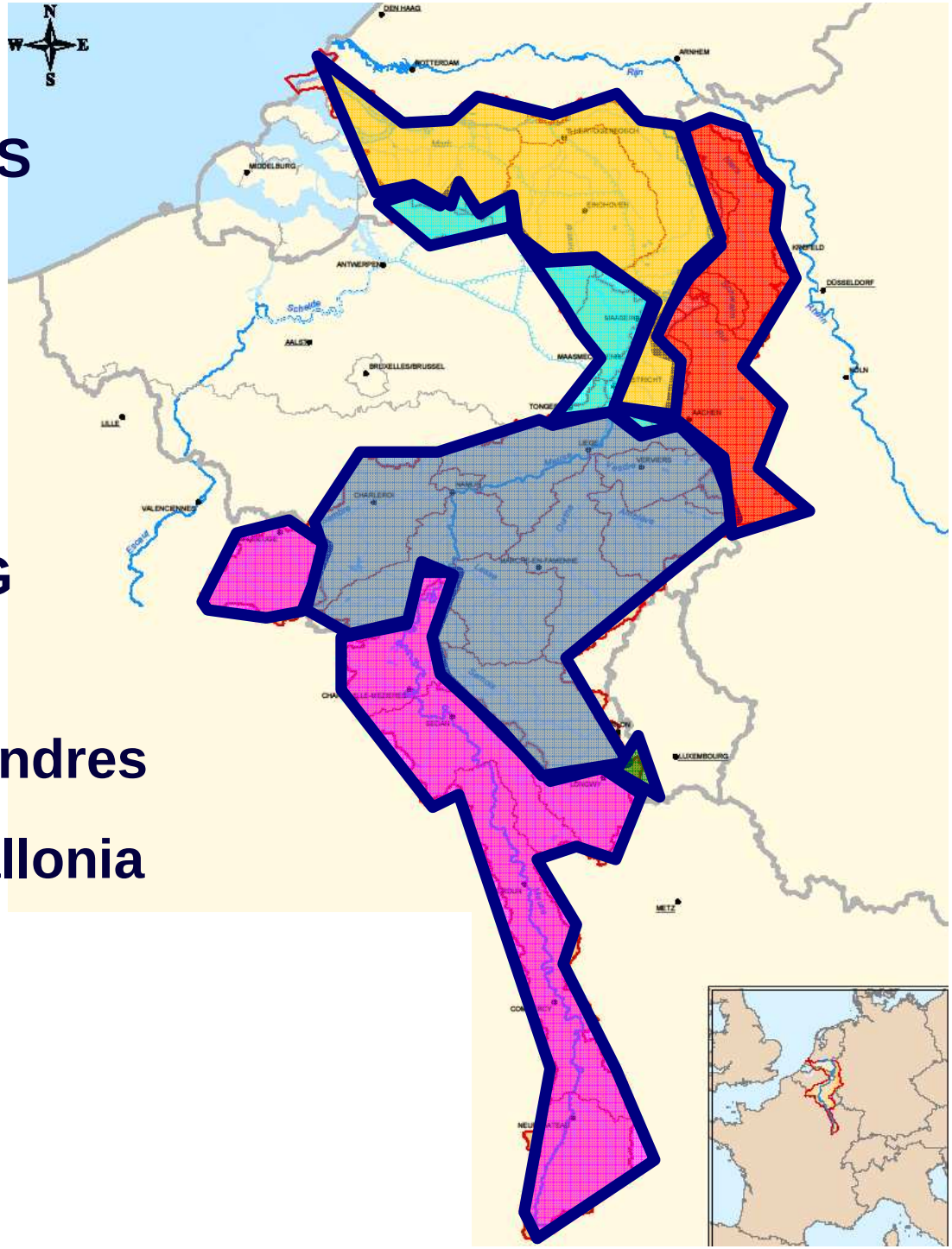
GERMANY

LUXEMBOURG

BELGIUM - Flandres

BELGIUM - Wallonia

FRANCE



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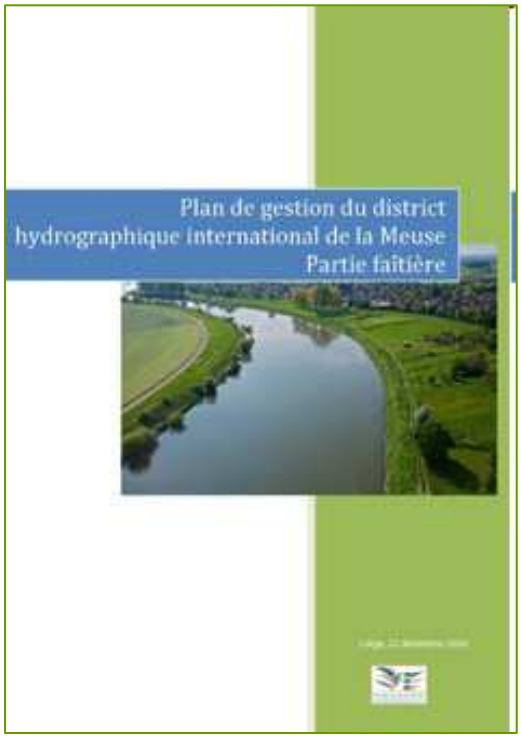
CIM IMC IMK



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Adapt by sharing knowledge

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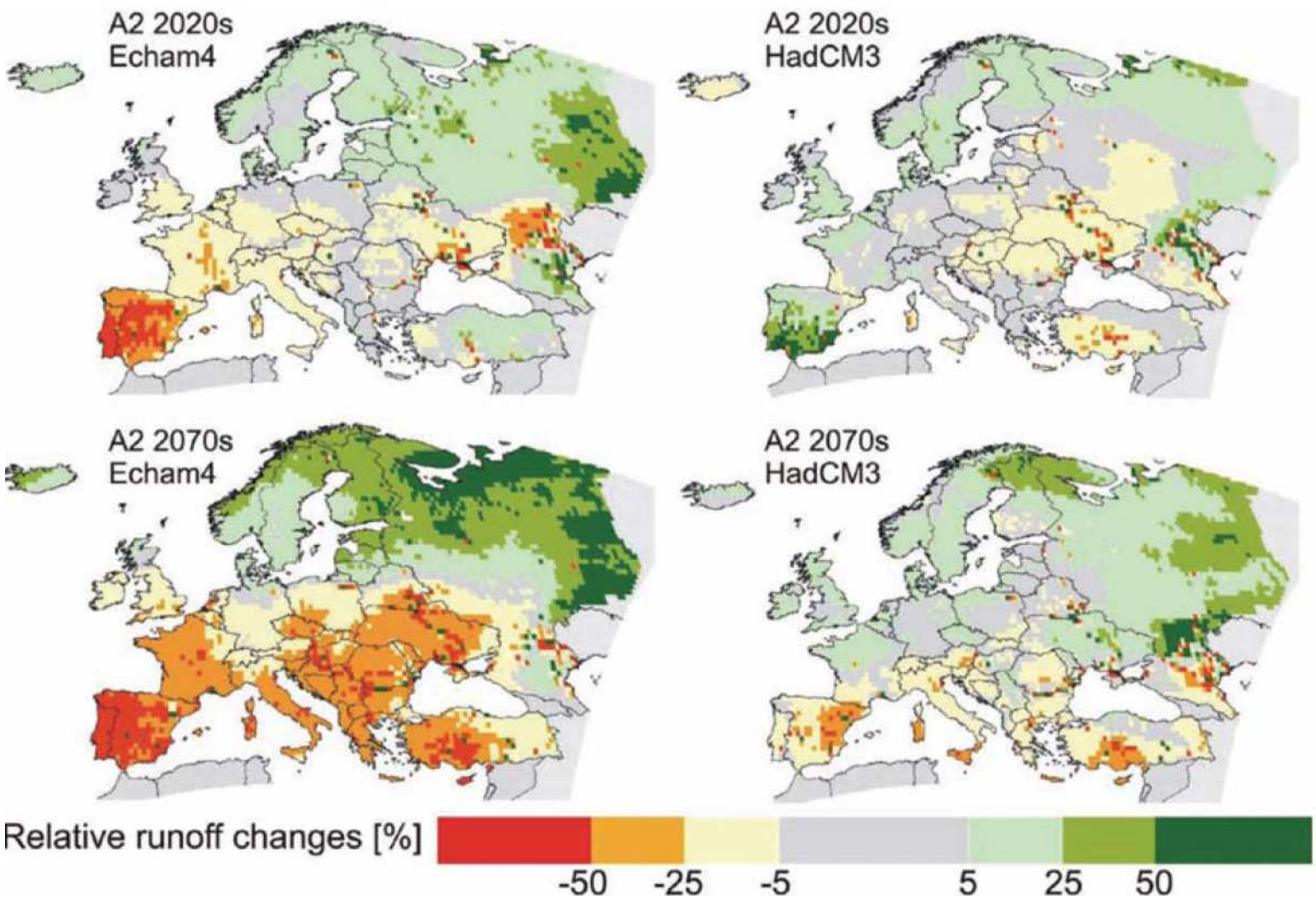
Meuse basin =

Echam4 model : less runoff / HadCM3 model : more runoff ?

Seasonal trends are necessary !



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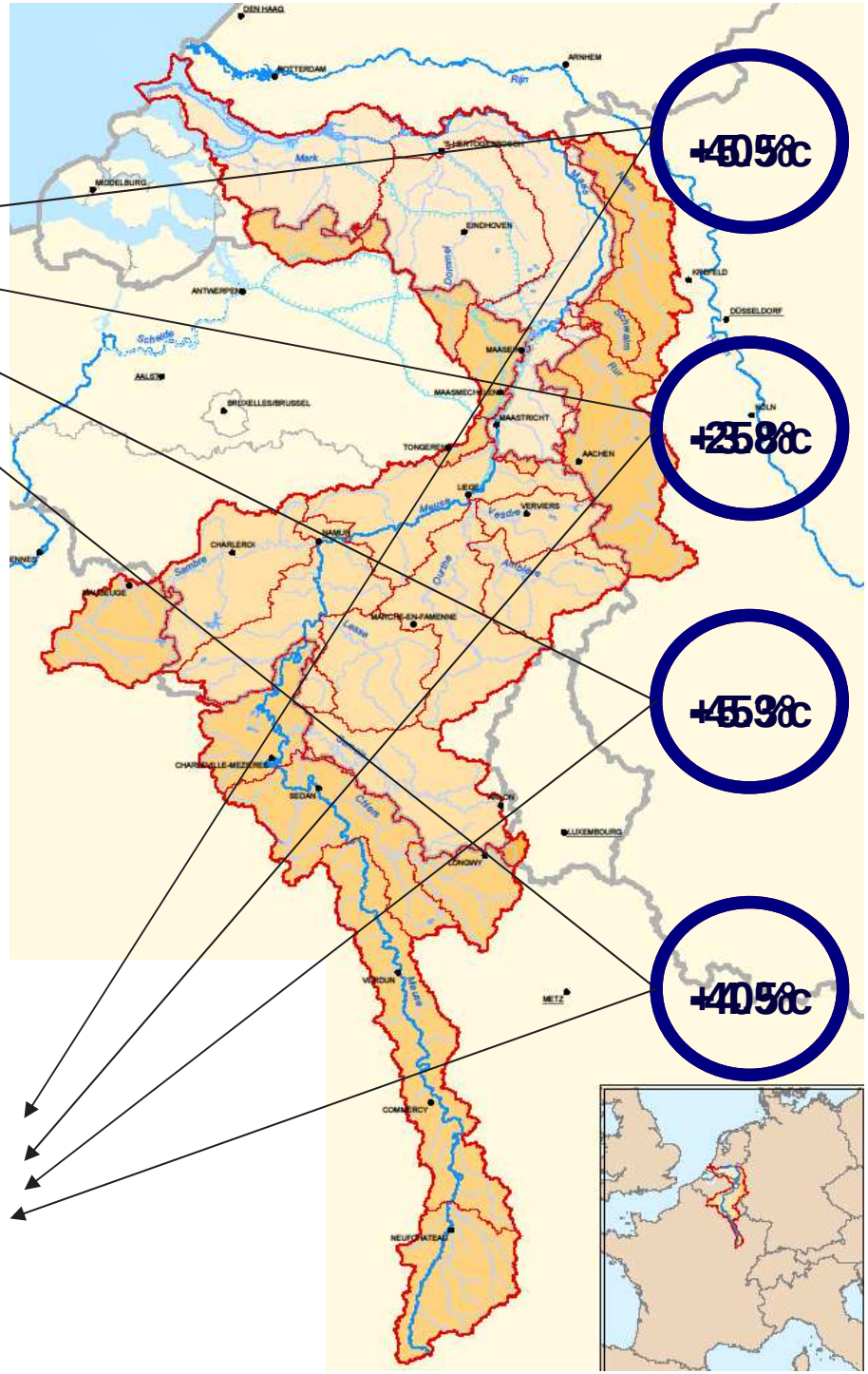
+4.9°c

dry scenario

2070-2100

summer



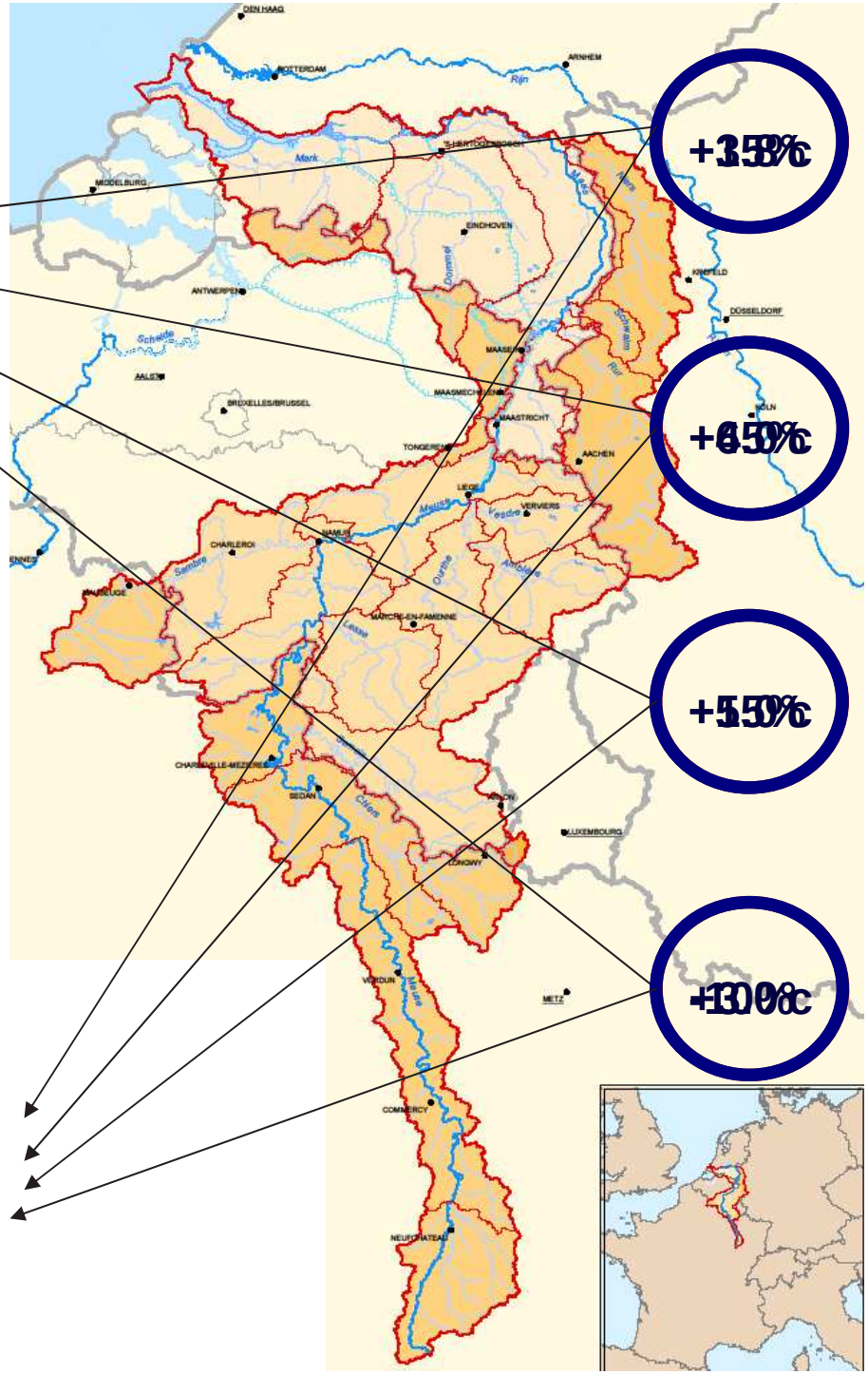
-40%

+2.8°c

wet scenario

2070-2100

winter



+3.5%

+6.5%

+5.5%

+3.0%

+25%

Hydrological impact variables :

High flows

Qhx100 (annual hourly maximum discharge)

Low flows

MAM7 (mean annual 7-day minimum flow)

Return periods :

High flows

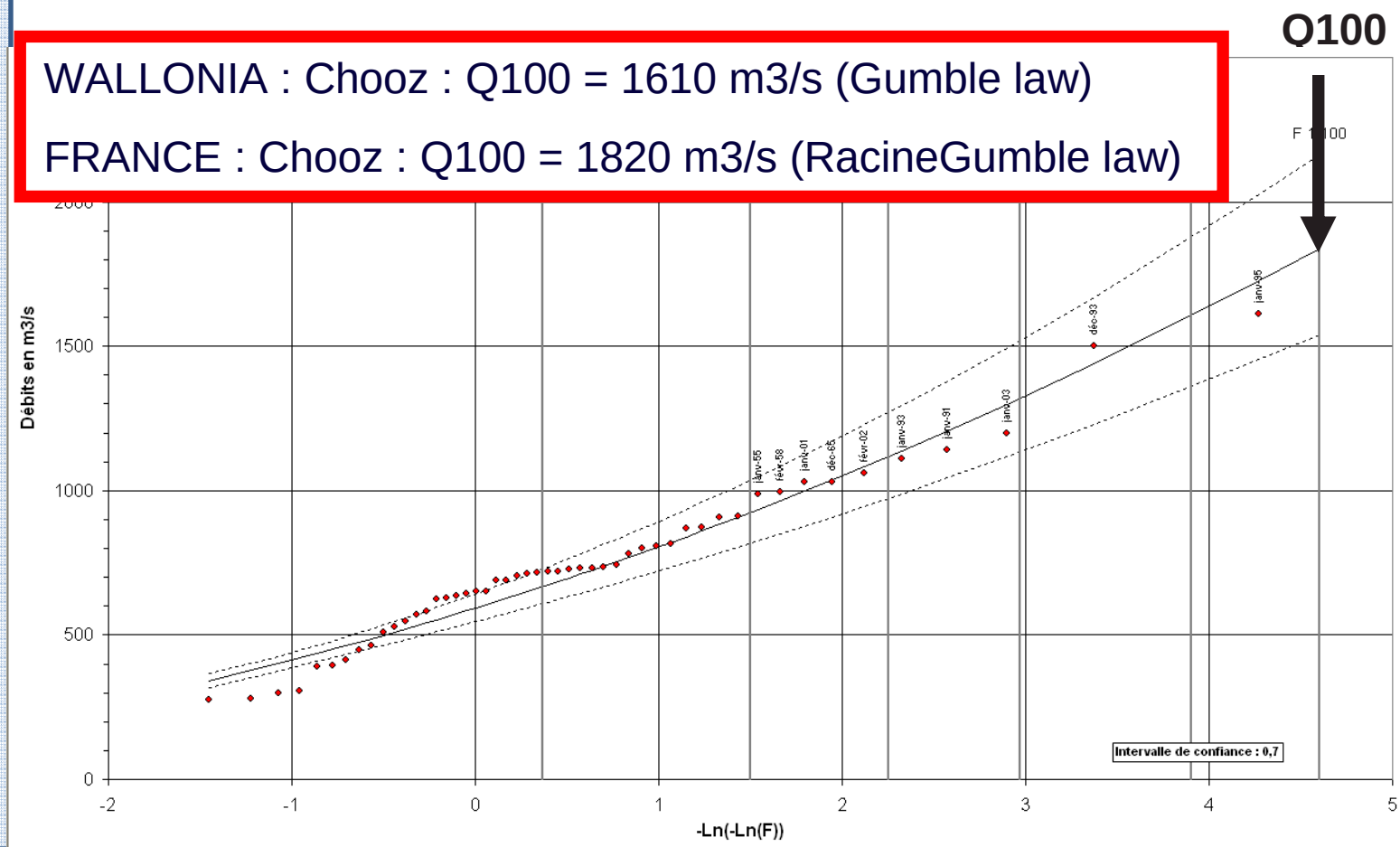
T[y] = **100** - 250 - 1250

Low flows

T[y] = 2 - 5 - **10** - 25 - 50

WALLONIA : Chooz : Q100 = 1610 m3/s (Gumble law)

FRANCE : Chooz : Q100 = 1820 m3/s (RacineGumble law)



dry scenario

Commercial model SOBEK
1D cross sections for floodplains
100 years at Borgharen
Reconstructed hydrograph

2070-2100

summer

wet scenario

Commercial model SOBEK
1D coupled with 2D for floodplains
50 years data
Steady simulation

2070-2100

winter

Commercial model MIKE11
1D + side branches/flood cells
35 years data
Composite hydrograph

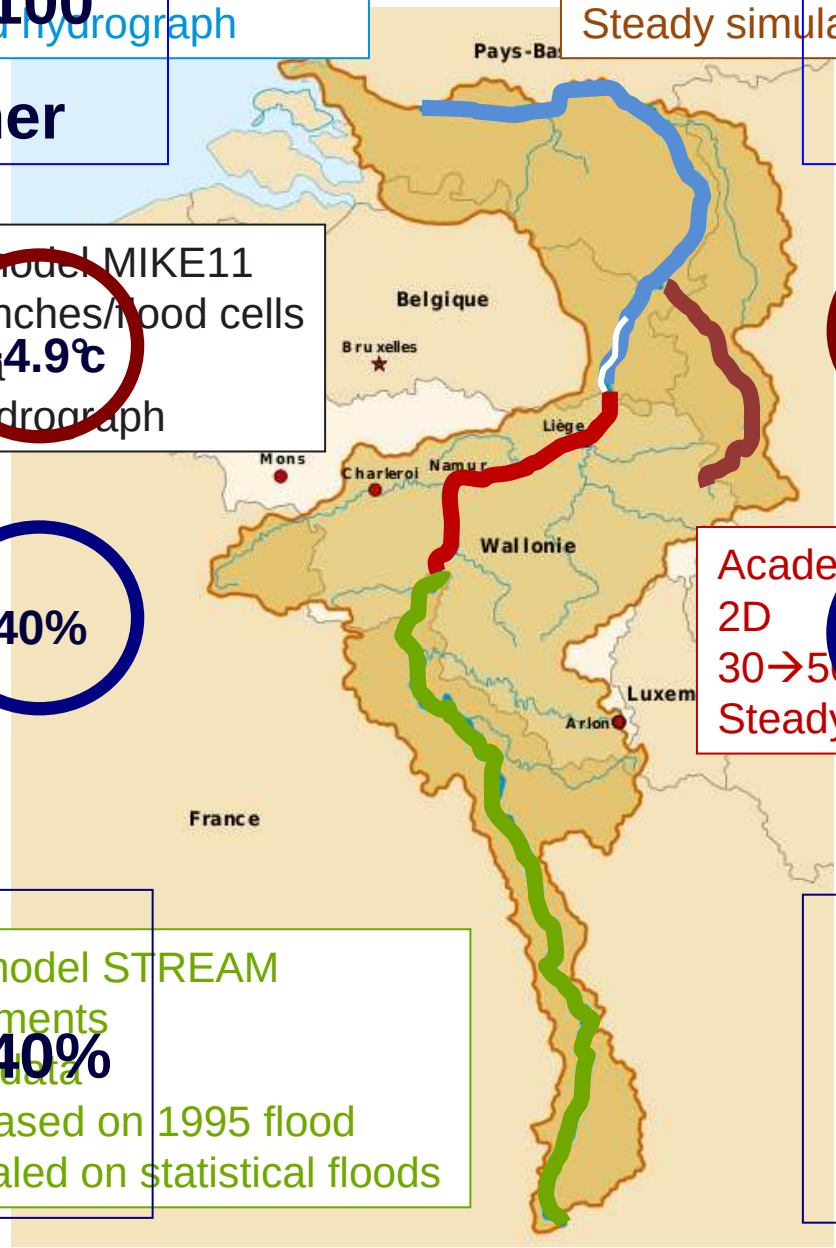
+4.9℃

+2.8℃

-40%

Academic model WOLF2D
2D
30→50 years data
Steady simulation

+25%



Commercial model STREAM
1D + compartments
30 → 40 years data
Hydrograph based on 1995 flood shape and scaled on statistical floods

MAM7 -40%

Q100 +30%

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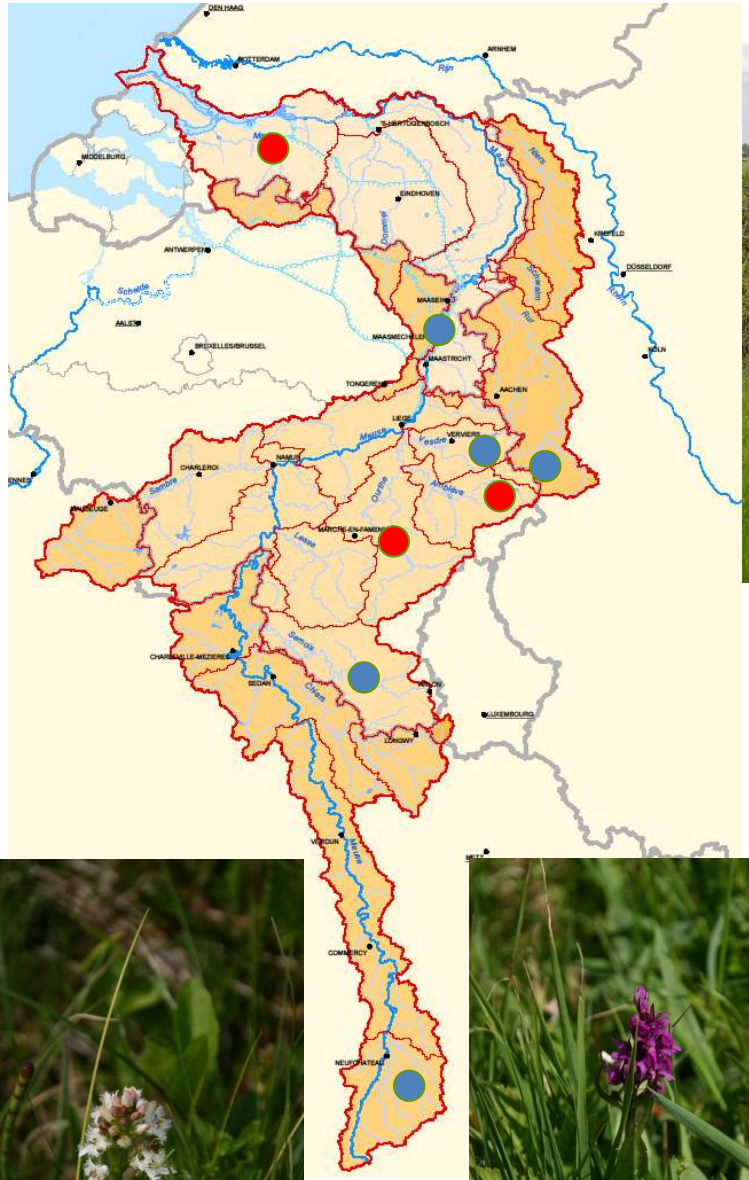

Conservation of wetlands

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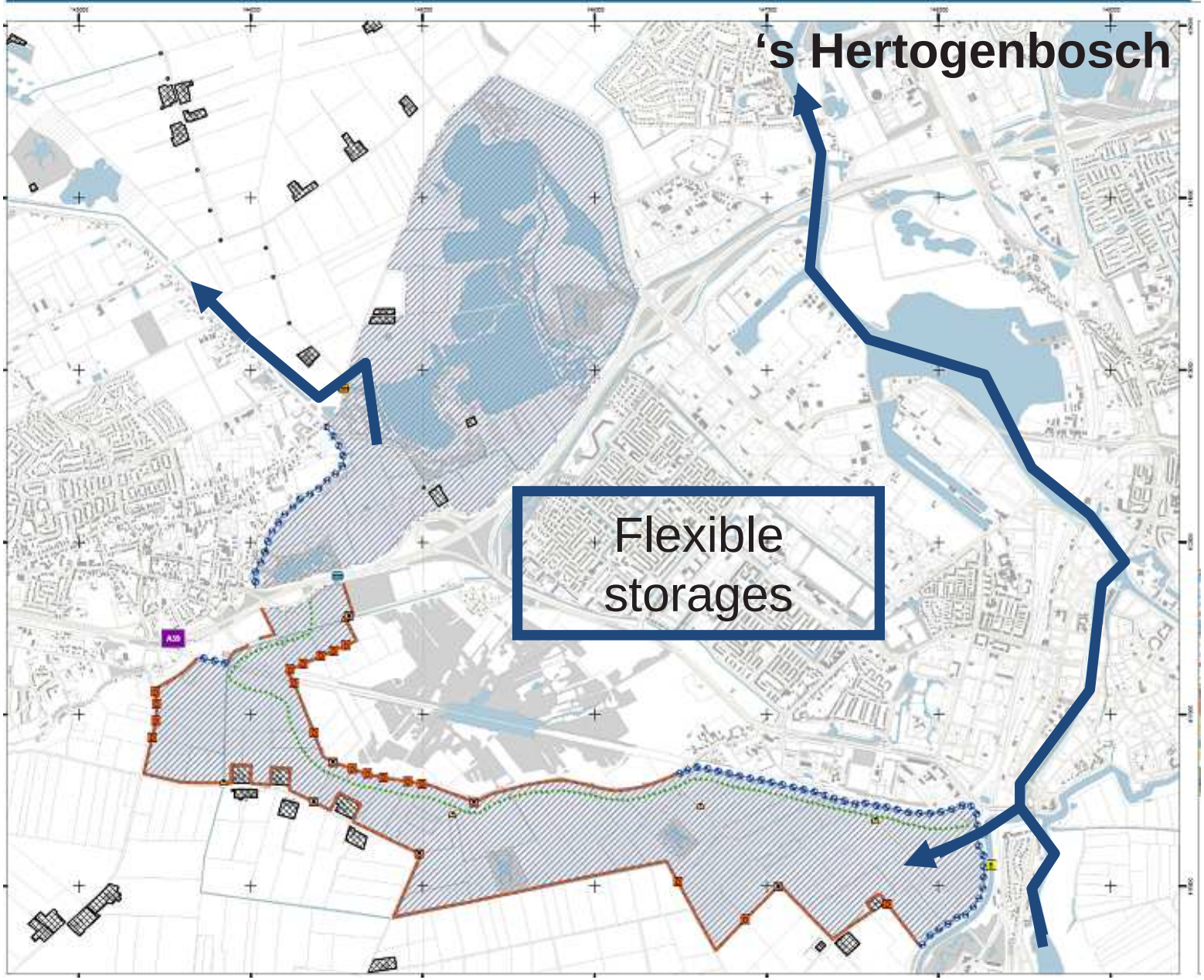
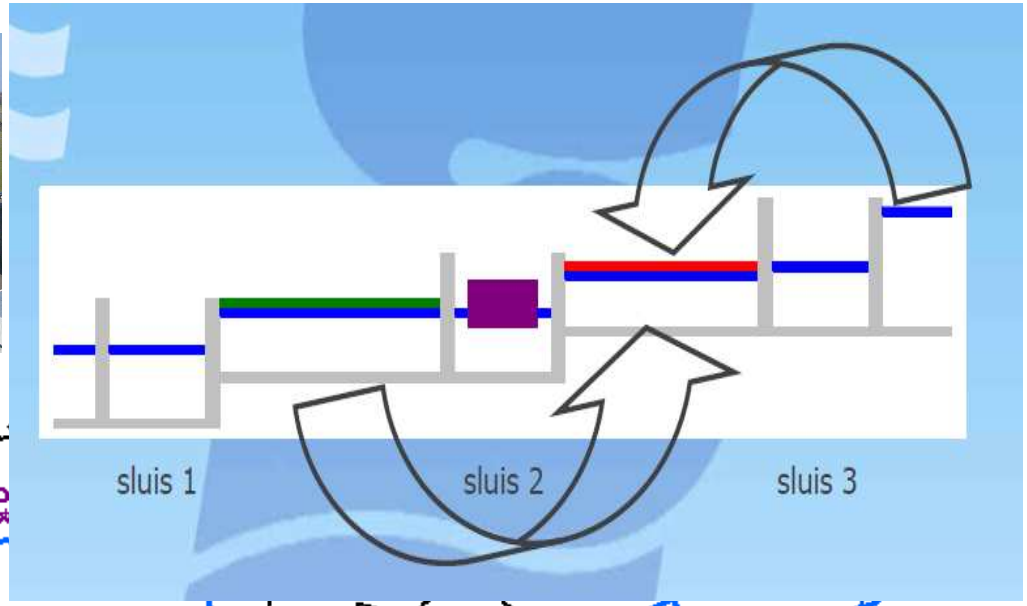
Groene Rivier (Kadehoogte 3.75 m + NAP)





Water savings

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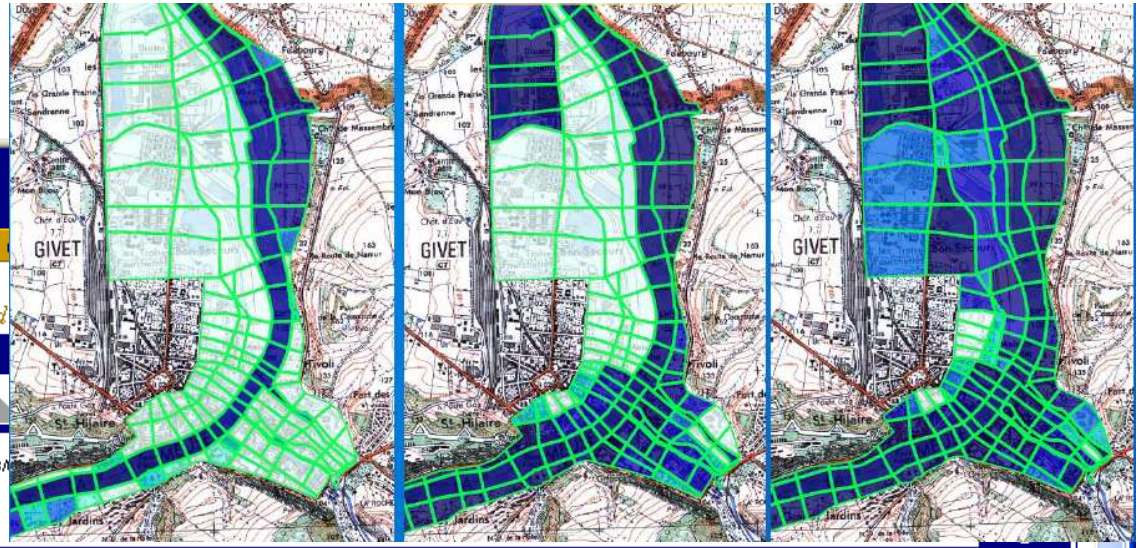

Préparation de crise | Gestion de

Accueil > Gestion de crise > Plans d

Edition d'un plan d'actions

Fiche | Plan calculé | Cartographie

Actions à déclencher — le 2003/ (à t)

Enjeu touché	Secteur	Niveau d'alerte	Action	Durée	Date début	Date fin
Habitat SDF route de DRY	ARDOUX AVAL	1/Vigilance	EVACUATION CARAVANES	01h00	2003/01/10 00:00:00	2003/01/10 00:00:00
Habitat SDF ROUTE DE MEUNG	ARDOUX AVAL	1/Vigilance	EVACUATION CARAVANES	01h00	2003/01/10 00:00:00	2003/01/10 00:00:00
Habitat SDF route de DRY	ARDOUX AVAL	2/Alerte	SURVEILLANCE DES HABITATIONS ET DES IMMOBILIERS COMMUNAUX	12h00	2003/01/12 00:00:00	2003/01/12 00:00:00
Habitat SDF ROUTE DE MEUNG	ARDOUX AVAL	2/Alerte	SURVEILLANCE DES HABITATIONS ET DES IMMOBILIERS COMMUNAUX	12h00	2003/01/12 00:00:00	2003/01/12 00:00:00

Retour à la fiche | Rapport détaillé | Feuille de route

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Climate Changing ? Meuse Adapting !

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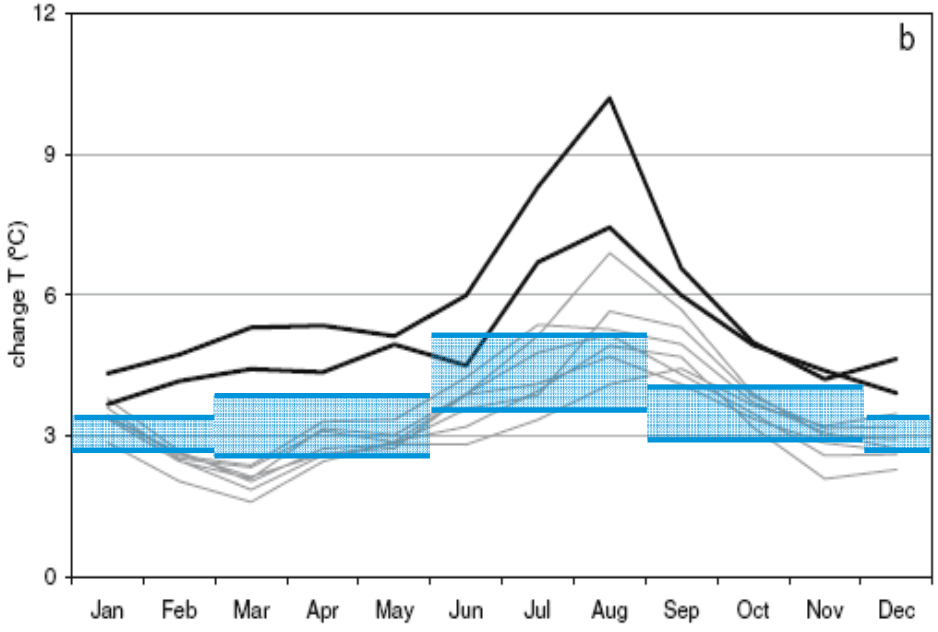

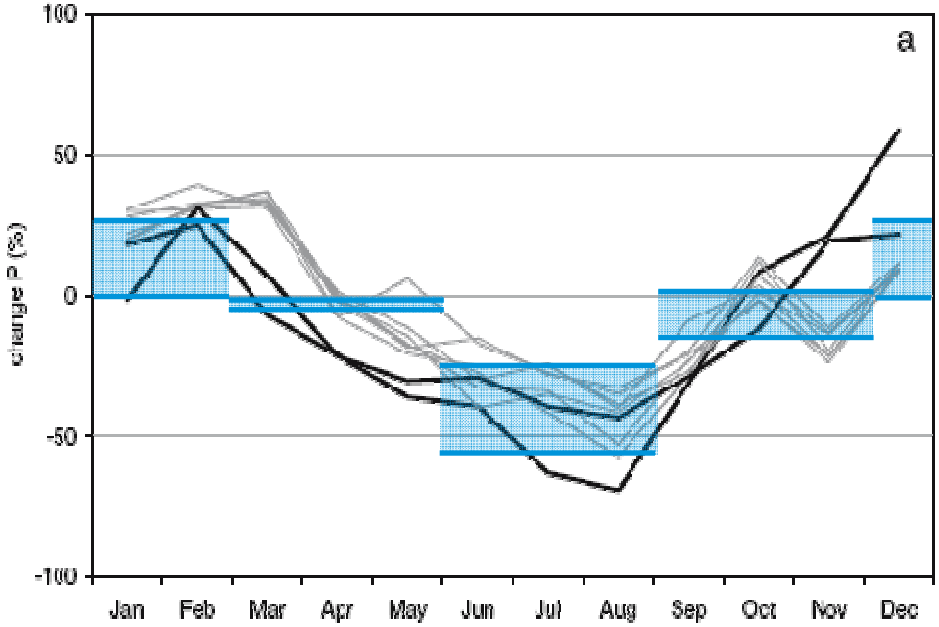

Fig. 4 Change in monthly precipitation (a) and temperature (b) in the Meuse basin derived from nine RCM simulations. *Bold lines* are RCMs driven by ECHAM4/OPYC, *thin lines* are RCMs driven by HadAM3H