



Application of SWAT Model to Evaluate the Impacts on Water Resources of Some Climatic Scenarios in a Catchment of the Basque Country

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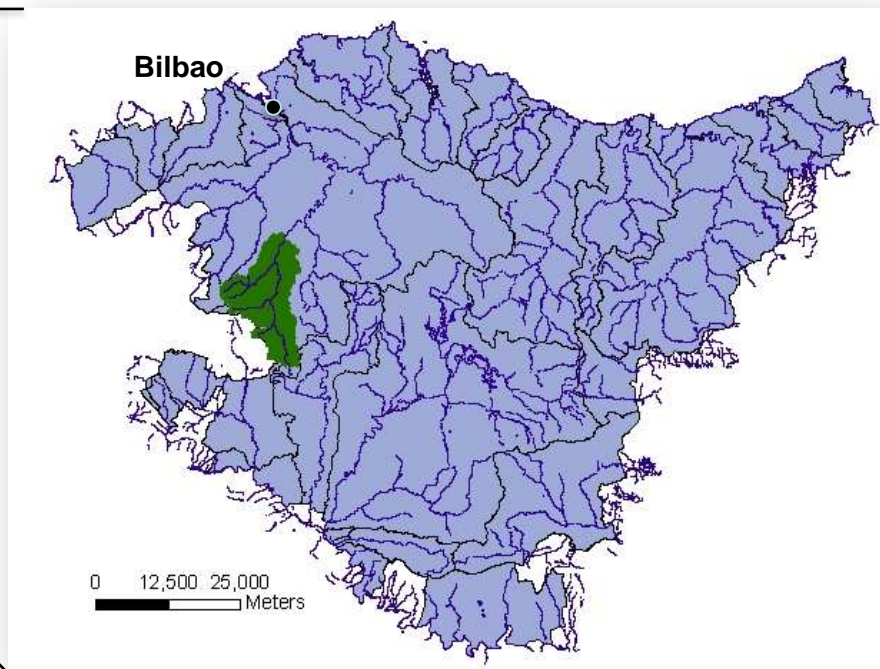
K-EGOKITZEN

- ETORTEK strategic research program of the Basque Government.
- Objectives:
 - Development of knowledge about the impacts of global change.
 - Research about possible ways of adapting to cope with these impacts.
- Four study sections:
 - **Urban Environment and Infrastructure**
 - Coastal Environment
 - Terrestrial ecosystems
 - Marine ecosystems





GOI-NERBIOI CATCHMENT



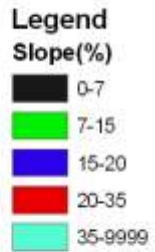
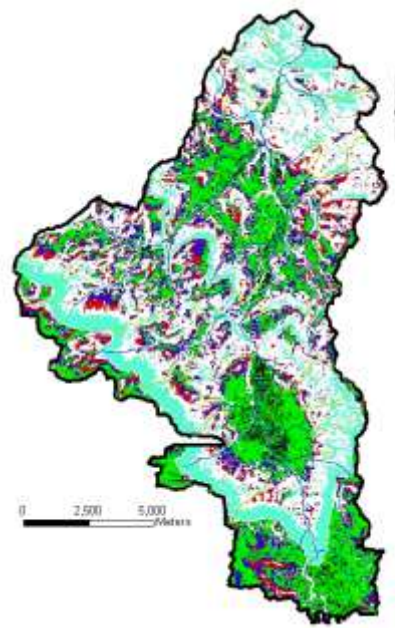
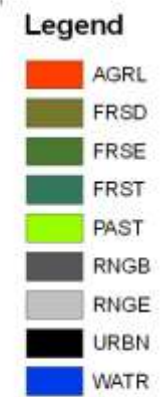
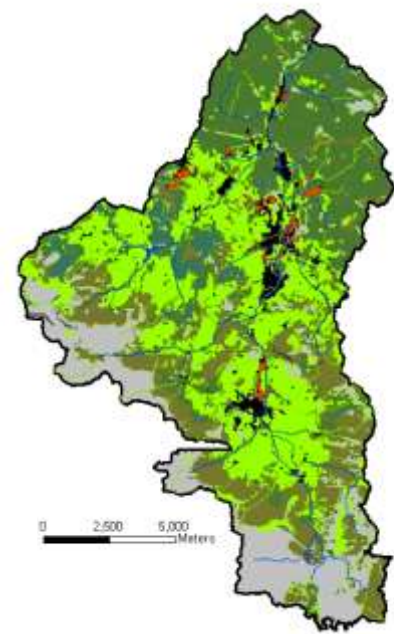
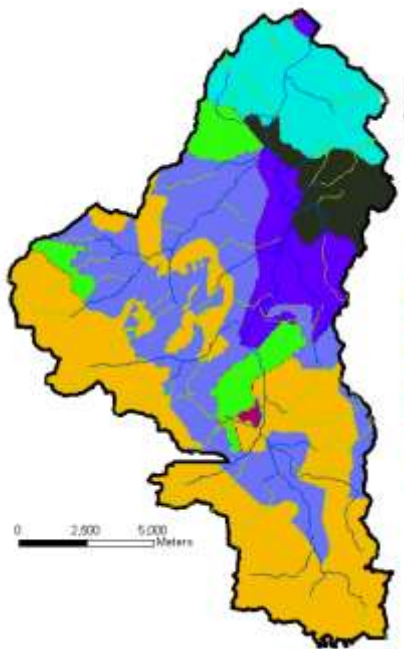
PCP average = 800-1000 mm
T average = 12-13 °C



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Watershed: 180 km²

•4 pcp stations:

- 2001-2006 calibration
- 1 meteorological station
- 2006-2010 validation



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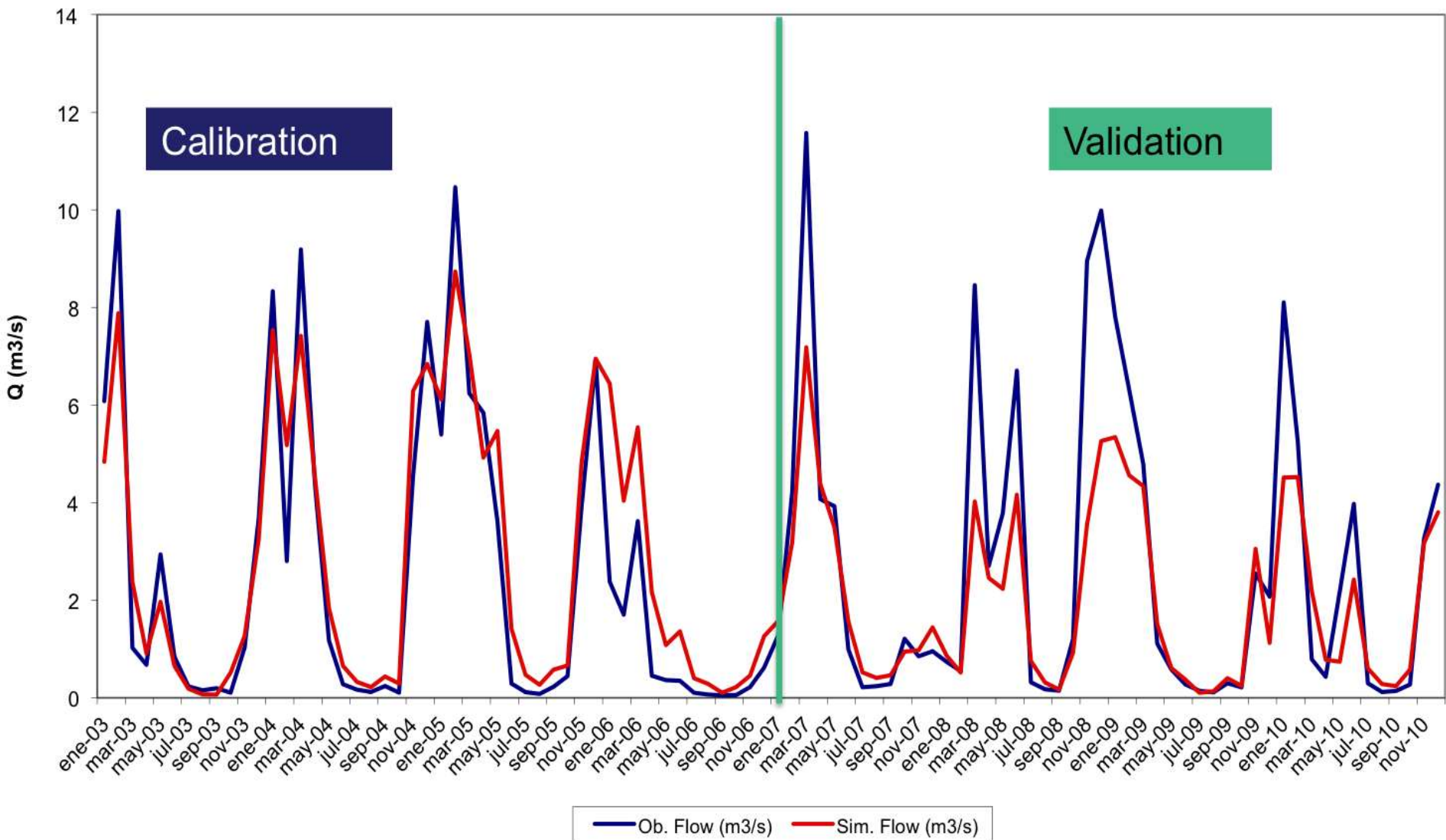
Calibration

	NASH	r^2	PBIAS	RSR
DAILY	0,68	0,68	13,87	0,56
MONTHLY	0,85	0,87	14,1	0,38
YEARLY	0,94	0,77	16,04	0,94

DAILY → NSE >0,65 very good. *Saleh et al. (2000)*
 PBIAS <10% to <15% good. *Van Liew et al. (2007)*

MONTHLY → $0,75 \leq \text{NSE} \leq 1$ very good
 $10\% \leq \text{PBIAS} \leq 15\%$ good
 $0 \leq \text{RSR} \leq 0,5$ very good
Moriasi et al. (2007)

MONTHLY FLOW CALIBRATION-VALIDATION





CLIMATIC SCENARIOS 2000-2050

- Methodology:

- Precipitation: Two climatic models.

- KNMI-RAKMO

- METNO-HIRHAM



-0,7 ± 0,3% decade

*Maddalen Mendizabal (Tecnalia R&I),
Roberto Moncho (Azti) y Guillem Chust (Azti).*

- Temperature: IPCC B2 scenario

AUTUMN	WINTER	SPRING	SUMMER
+2	+1	+1	+2

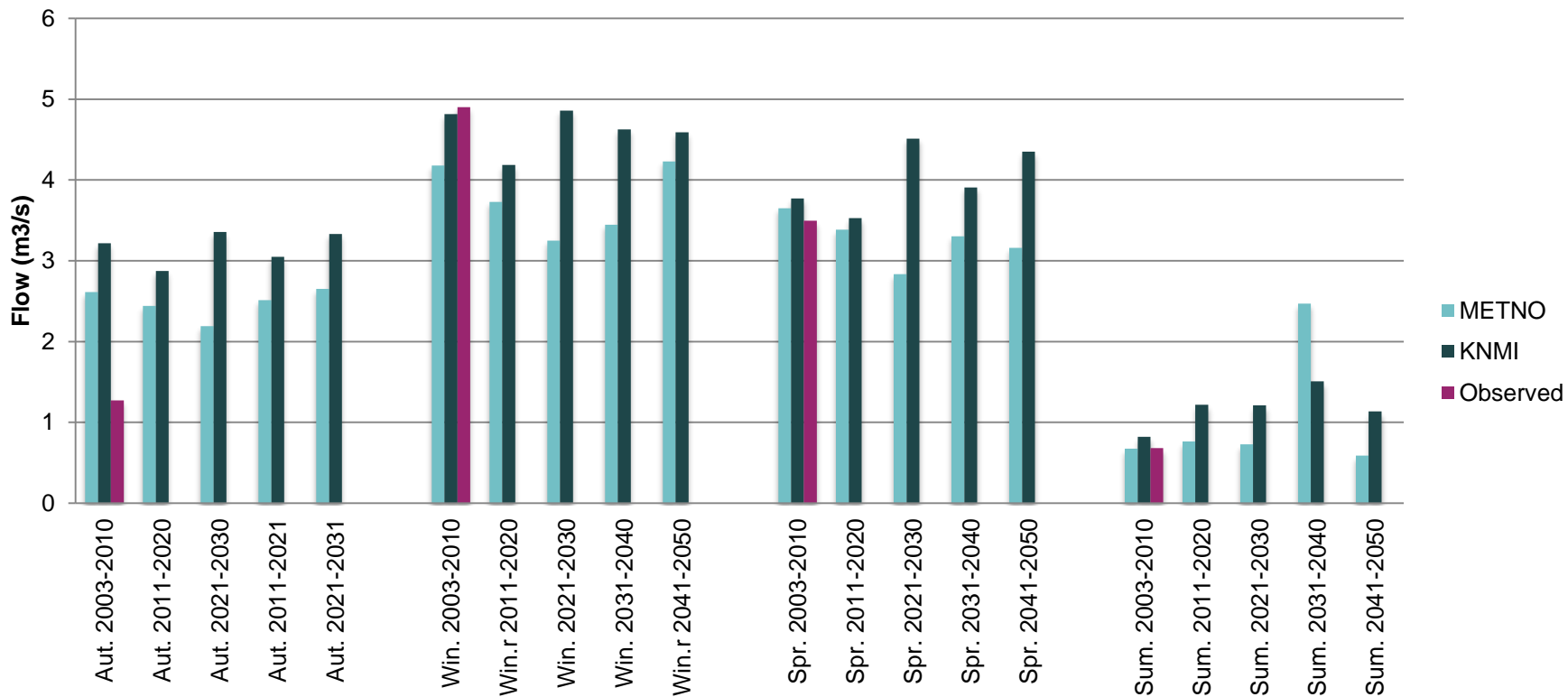


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Average Flow



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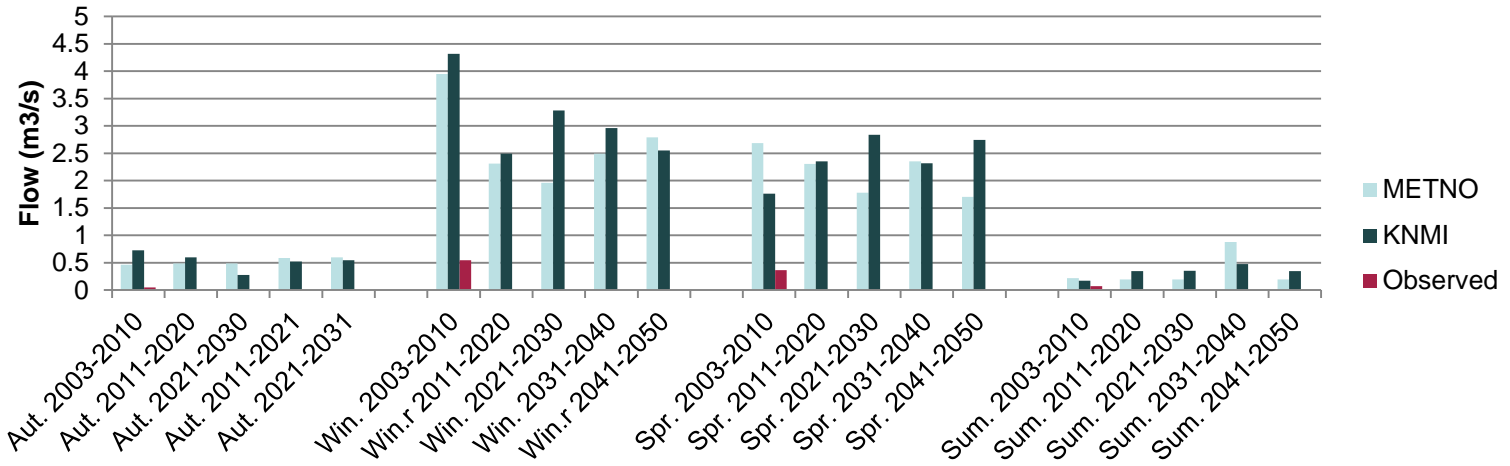


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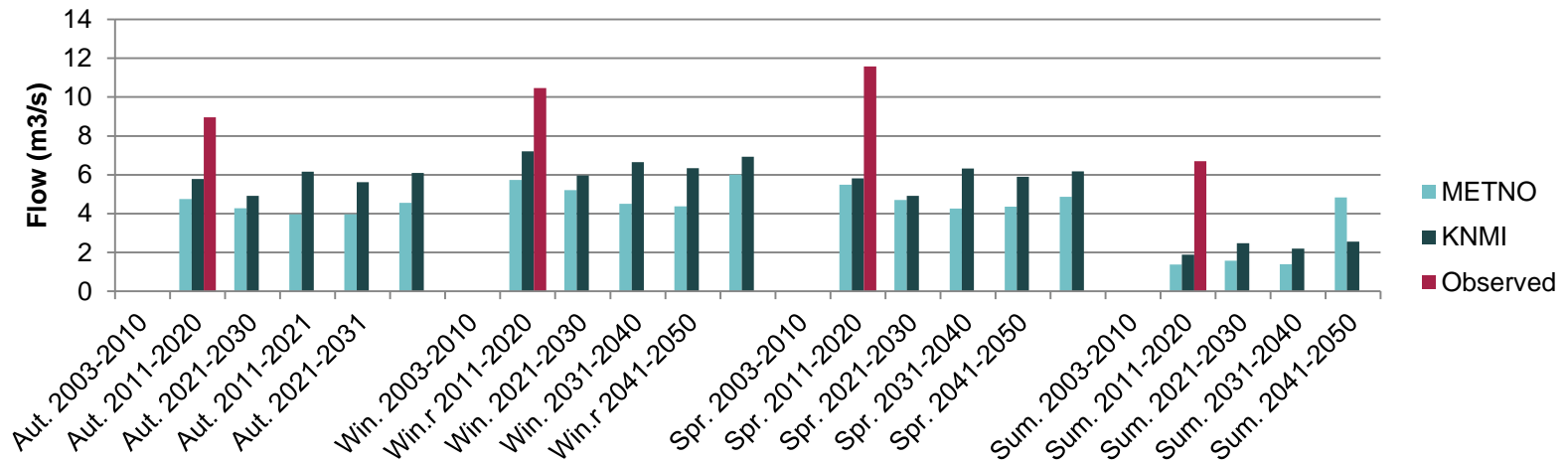


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Minimun Flow



Maximun Flow



CONCLUSIONS

HYDROLOGIC MODEL:

- Best results: monthly simulation.
- Statistical analysis → good results
- Accumulated flow in validation 23 % error

CLIMATIC SCENARIOS (2000-2050):

- Depending on the climatic model different results.
- No clear trends in the hydrologic results.

FUTURE PROJECTS:

- Analyse the differences for the accumulated flow.
- More simulation with the results of temperature models.
- Take into account future land uses.



THANK YOU

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PARAMETERS:

*bsn

-ESCO: 0.75

-SMTMPO: 1.5

-SURLAG:0.3

*gw

-RCHRG: 0

-SHALLST: 1000

-GW_DELAY:10

-ALPHA_BF: 0.04

-GWQMIN: 850

-REVAPMN: 900

*sol

-RANKER → SOL_AWC: 0.2

eman la rabai 2020



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