

# **Impact of climate change on Latvian water environment**

## **WP1: Impact of the climate change on runoff, nutrient fluxes and regime of Gulf of Riga**

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## WP1. GOAL

Modelling of several scenarios of the change of water environment using the existing climate change scenarios for Baltic Sea region

## WP1. TASKS

WP1a. Evaluate and adapt the results from the regional climate models, and design the series of data which form the state of the water objects.

**SCENARIOUS = MODEL DATA = FORCING CONDITIONS**

WP1b. Investigate and forecast the impact of the climate change on the river runoff and its seasonal variability. **MODELLING OF DRAINAGE BASIN**

WP1c. Adapt 3D sea state models to produce the data series for the forecast of biogeochemical processes and sea ecosystem evolution.

**OCEANOGRAPHIC MODELLING**

WP1d. Provide modelling and data analysis support for other WPs. **SUPPORT**



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TIME TABLES OF TASKS	2006				2007				2008				2009			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
1a SCENARIO							1 A									
1b DRAINAGE BASIN MODELLING										1 B						
1c SEA STATE MODELLING												1 C				
1d SUPPORT																1 D



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# DELIVERABLES

	RESULT	FORMAT	AMOUNT
	<b>1A</b> Quantitative scenarios of the climate change	Data series	3
	Regionally adapted model for the drainage basin (water, nutrients)	Model and methodics	1
	<b>1B</b> Forecast of the water and nutrients discharge	Data series	3



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Regionally adapted 3D sea state model	Mathematical model (methodics)	1
3D calculations of the hydroecosystem of the Gulf of Riga for the climate change scenarios	Data series	3



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- **Investigate access to RCM numerical results**
- **Choose scenarios**
- **Get model data series from several RCM for scenarios.**
- **RCM data quality control.**
- **Deliverable: climate scenarios as data series**

## VI

- **GIS for river run-off**
- **Modelling of selected pilotbasin with several models.**
- **Development of models & software.**
- **Calibration and verification incl. access to data.**
- **Calculations of river runoff X-XI**
- **Deliverable: water runoff data series X-XI**
- **Selection of approach for nutrient runoff.**
- **Domain selection for BS model**



# Team-2007

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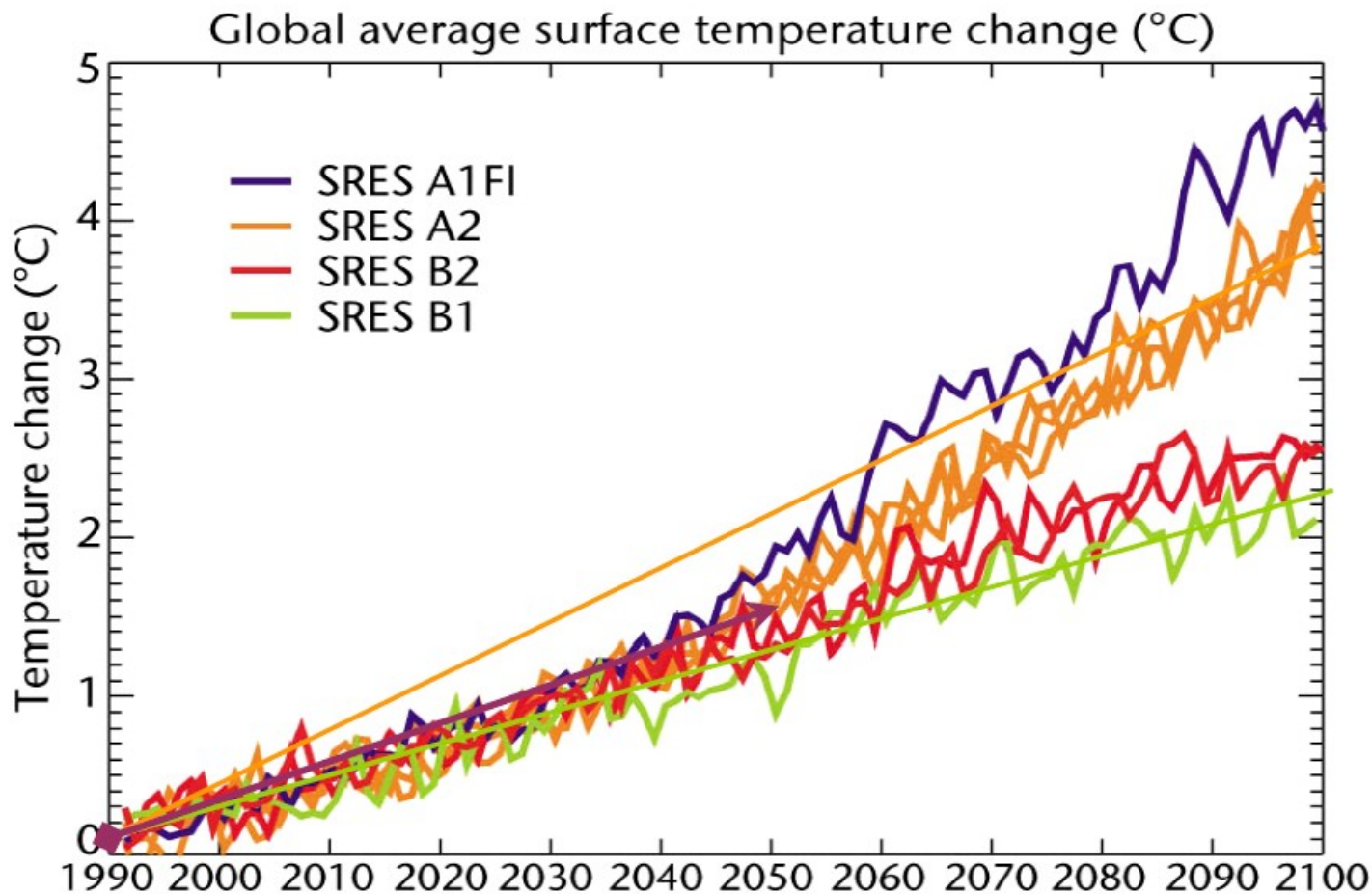


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# MISSING ARGUMENTS

WHAT PROCESS CREATES THE SWITCH?

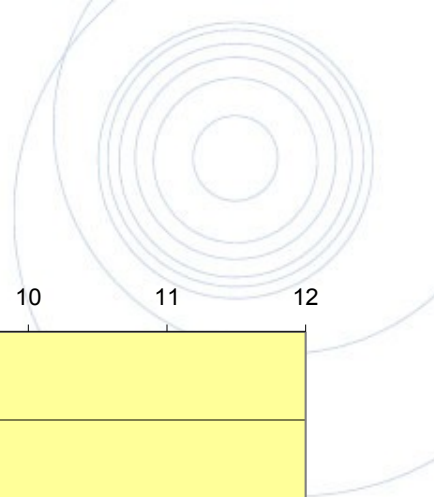


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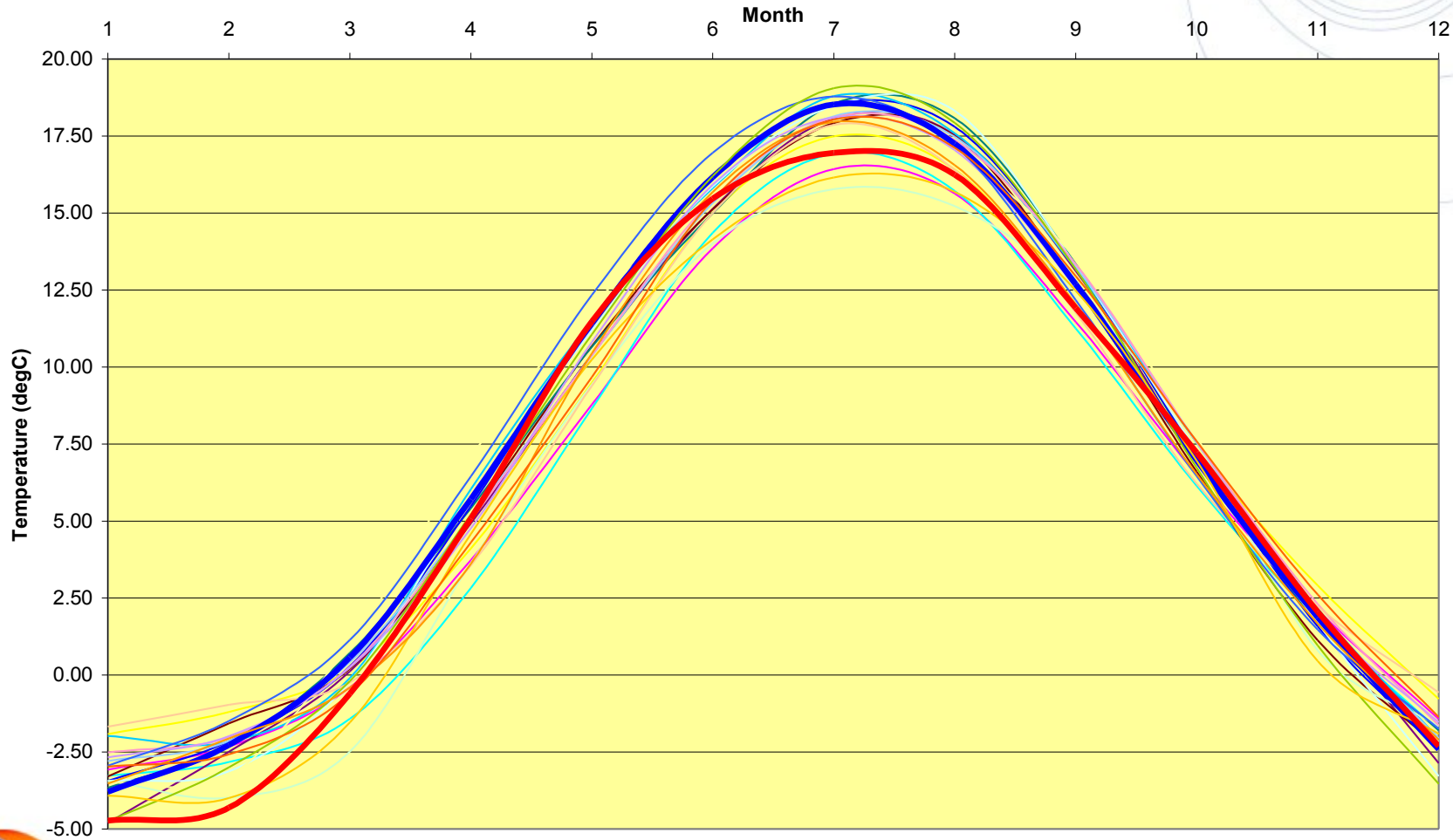
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# LOST IN TRANSLATION ?



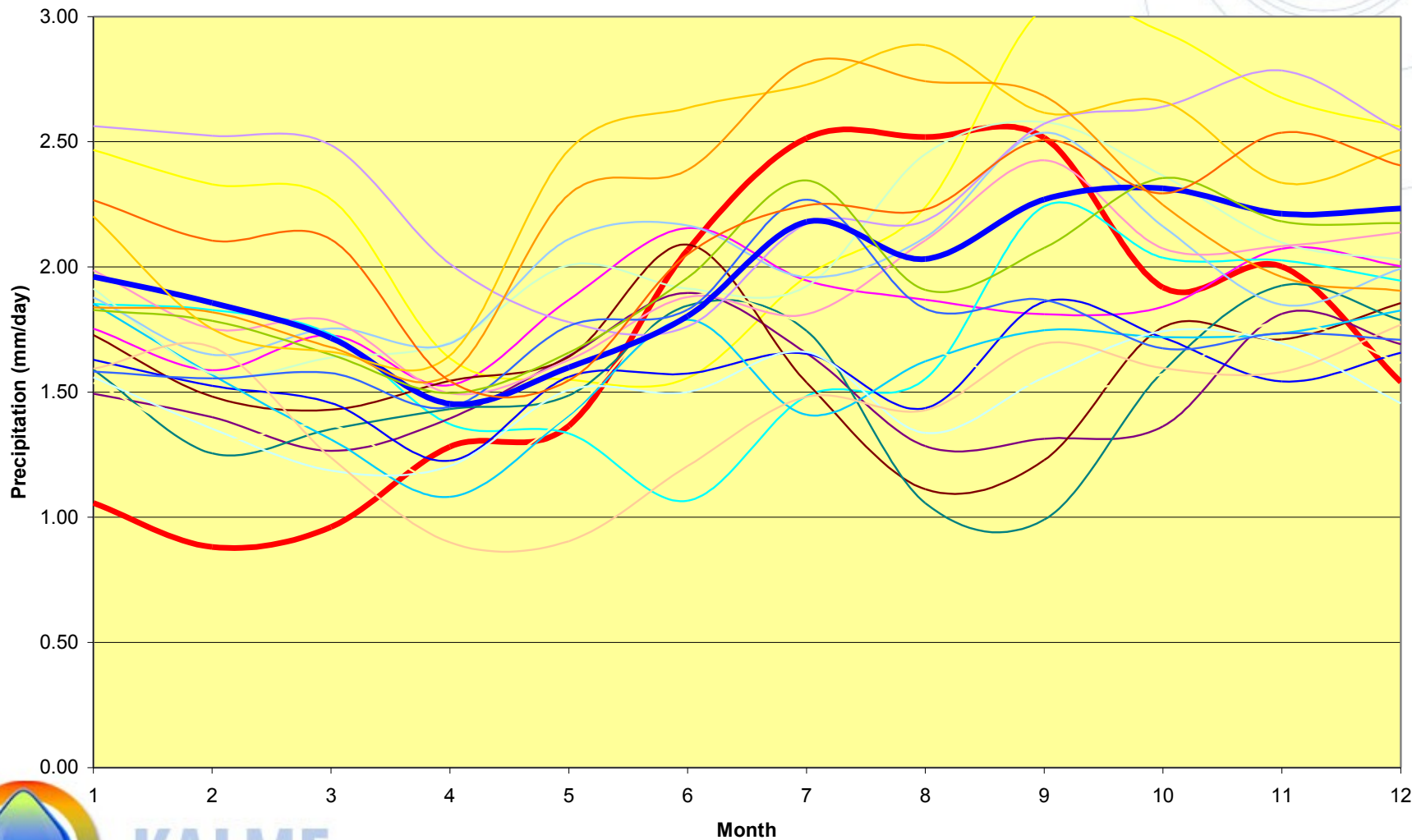
Monthly temperature (OBS = 6.2 degC, MOD = 6.9 degC)



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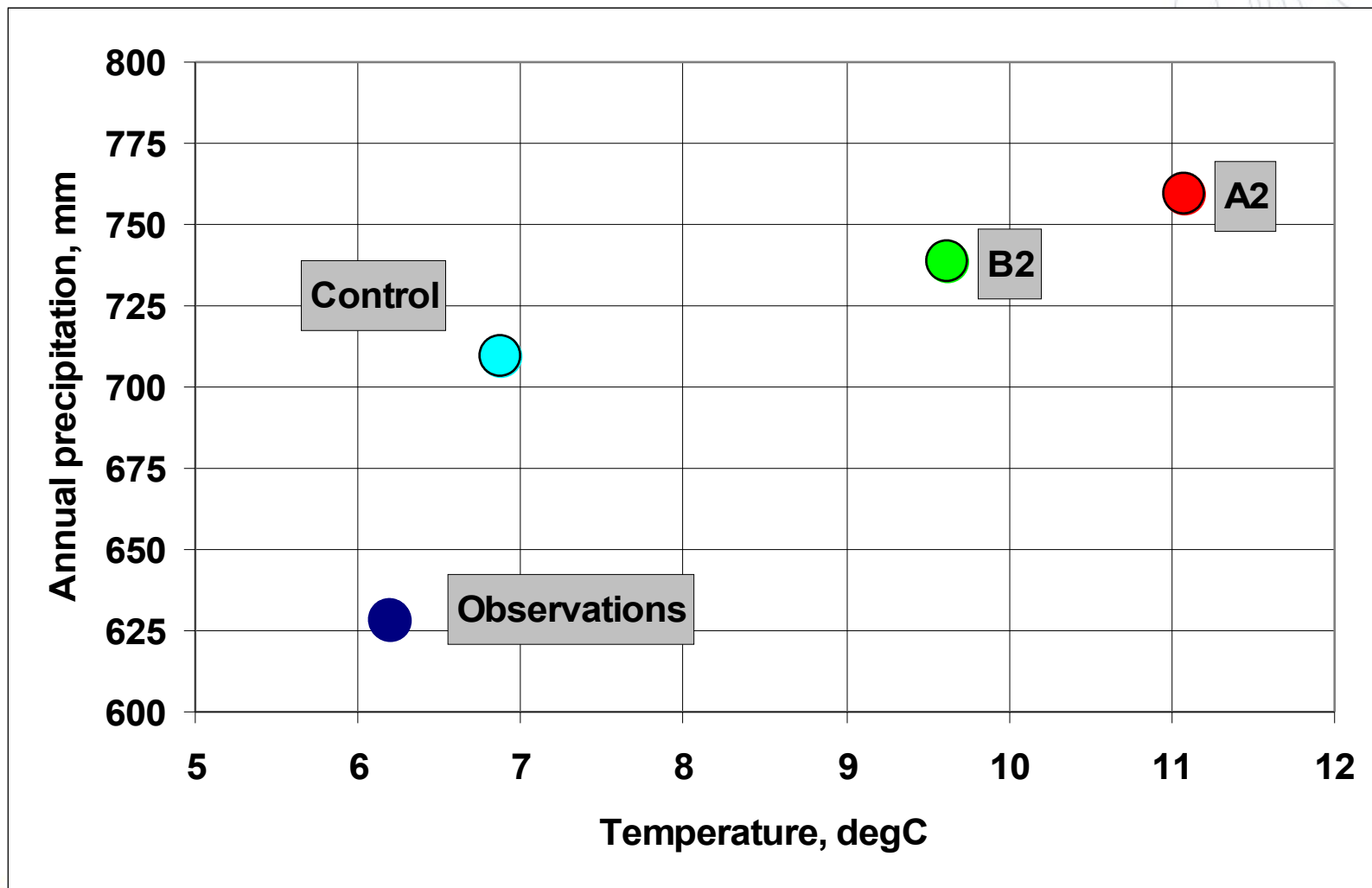
# Monthly precipitation (OBS = 620 mm, MOD = 708 mm i.e. +14%)



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# Increase of p, T – qualitatively ok, quantitatively nok



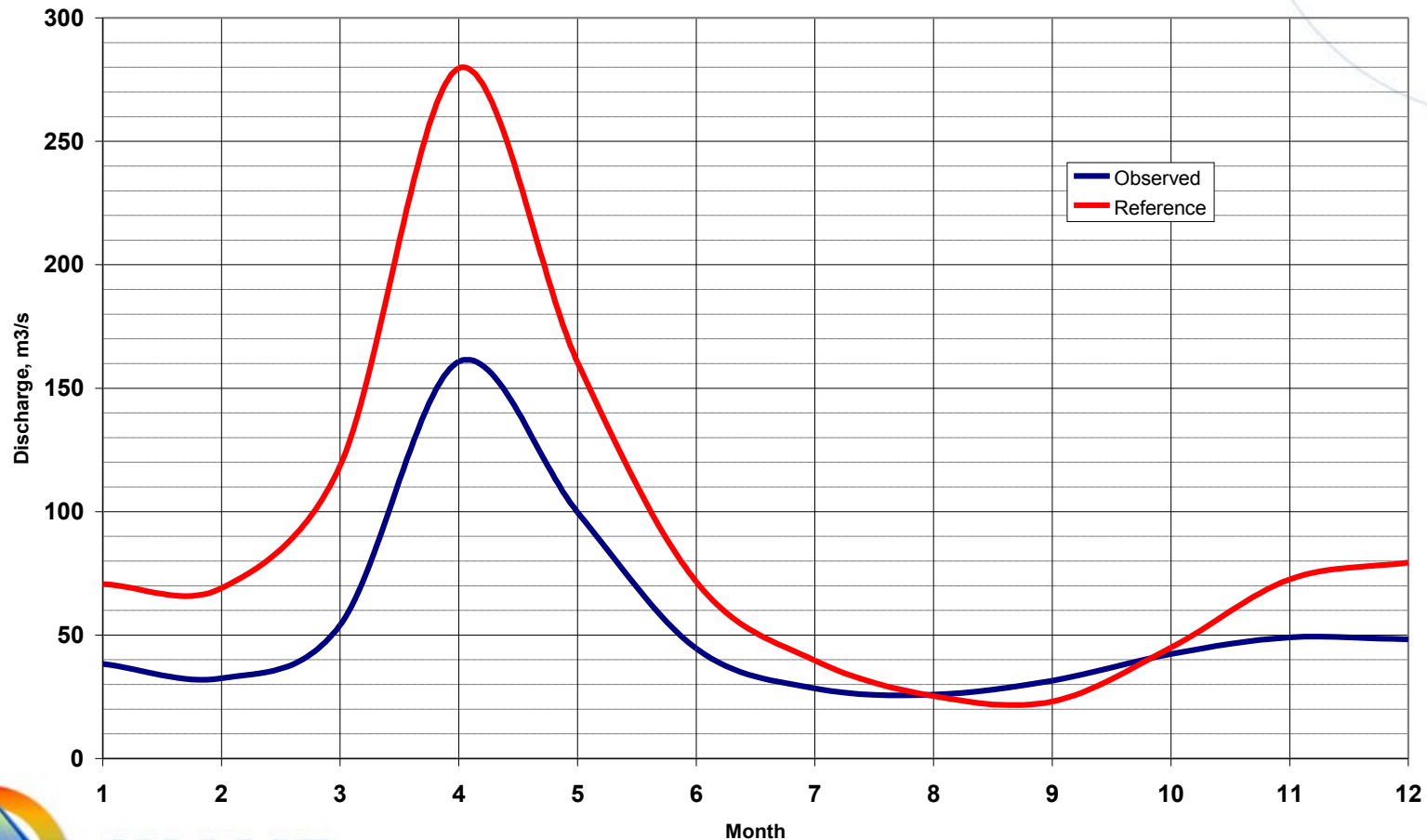
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# Hydrological modelling: control period

Comparison of observed Q / modelled Q (RCM forcing) 1961-1990

Average runoff: OBS 54.6 m<sup>3</sup>/s MOD 88.1 m<sup>3</sup>/s (+61% !!!)



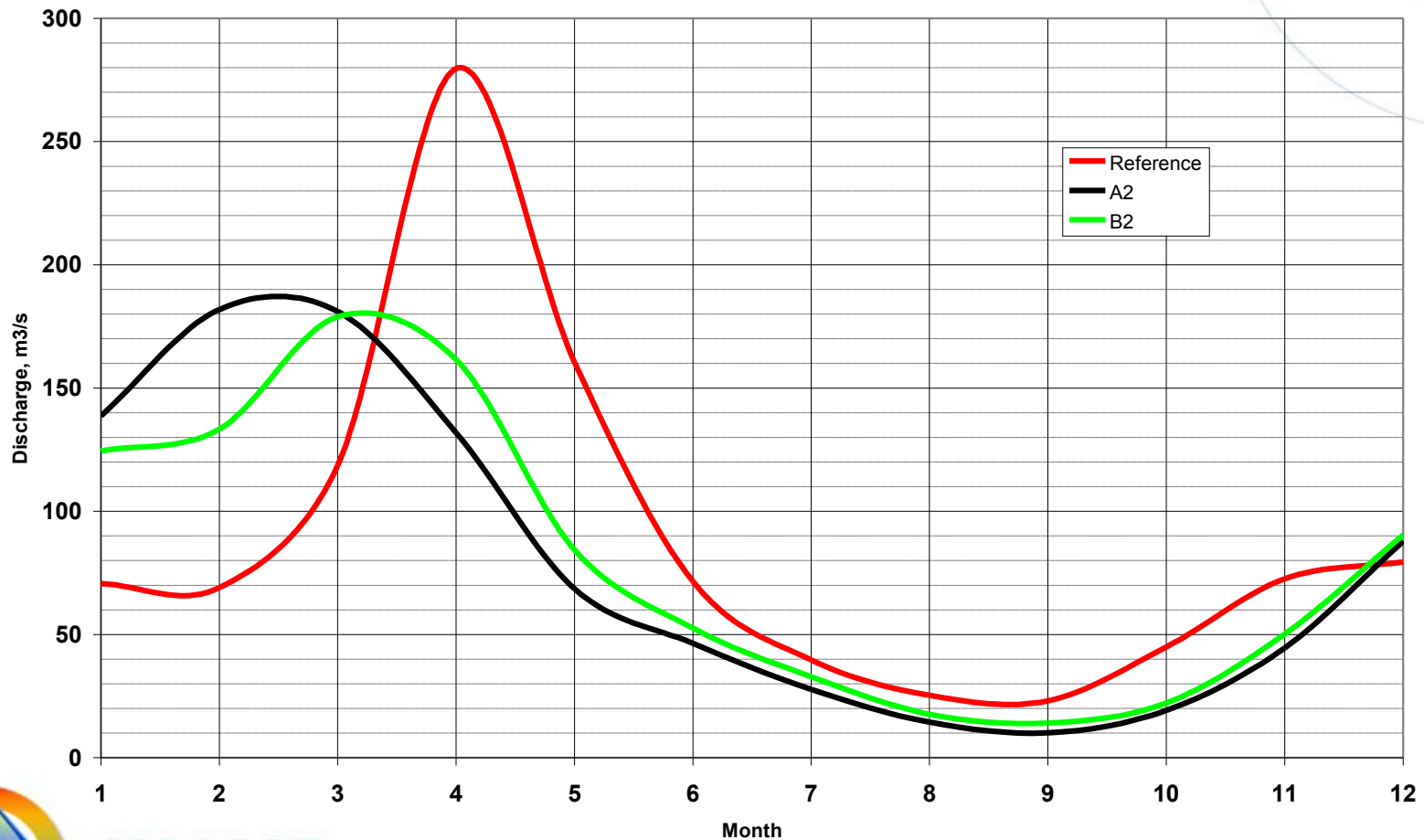
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# Hydrological modelling: scenarios

Modelled Q. Forcing by RCM data (T, p).

Comparison of control period (1961-90) and scenarios A2, B2 (2071-2100)



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# CONCLUSION LINE TO AVOID: DO NOT COMPARE OBSERVED CLIMATE WITH RCM FORECAST

Parameter	Tempting	Realistic
T	+5	+4 deg C
P	+150	+50 mm
Q	+60%	-5%
Nutrient	+150%	-10%



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