

Team 02 Presentation 3

Presentation 3: Results of the 2nd week





Catchment Var - Team 2 Presentation

Summary

1. Introduction
2. Climate change
3. Scenarios considered
4. Hydrological results
5. Hydraulics results
6. Conclusion



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Team 02 2



Erasmus+



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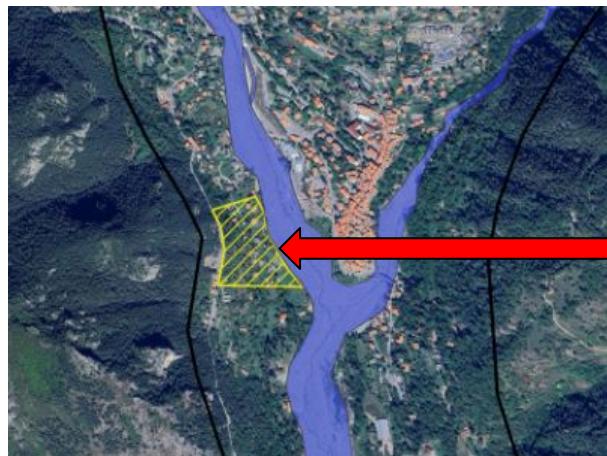




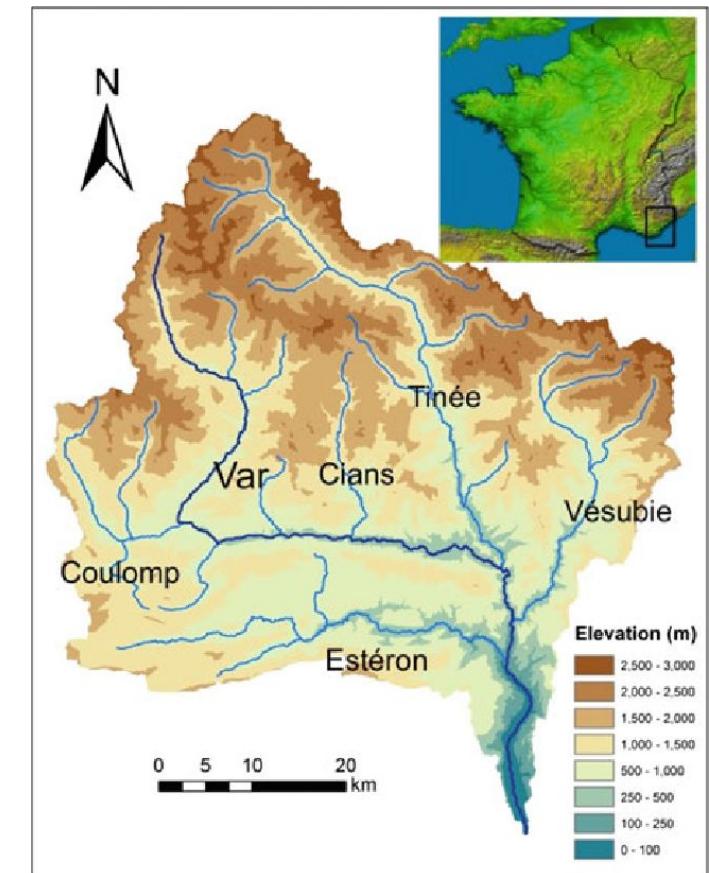
1. Introduction : Objectives

Climate change impacts on Flash Floods

- St Martin de Vésubie
- Climate change = pressing and complex challenge facing our society today
- Where to relocate the WWTP ?



Will it be the same?

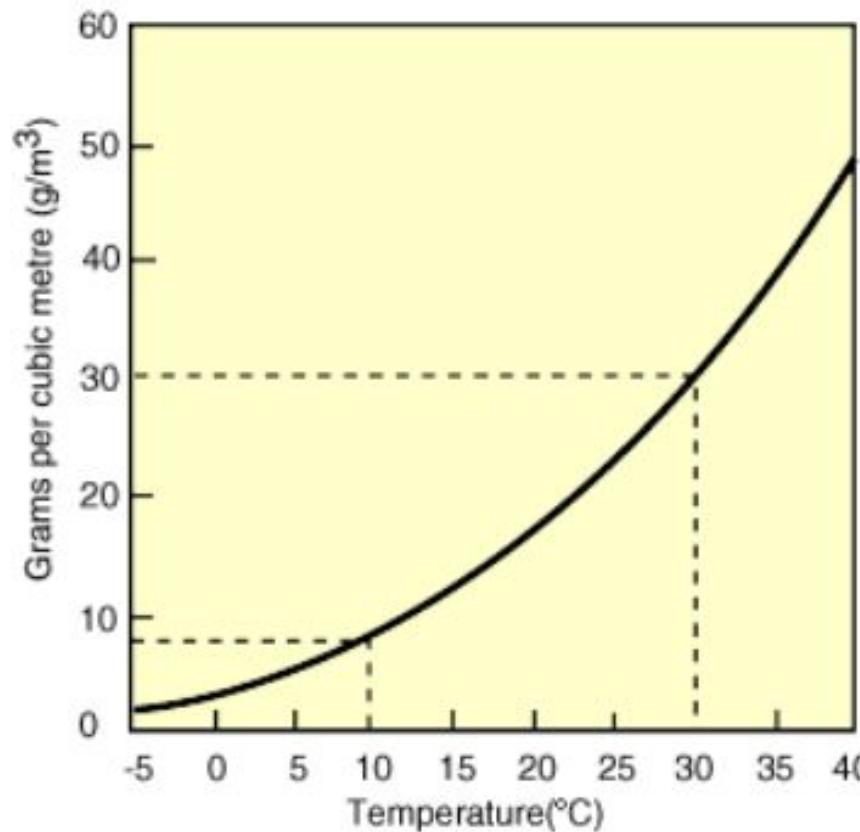


2. Climate change

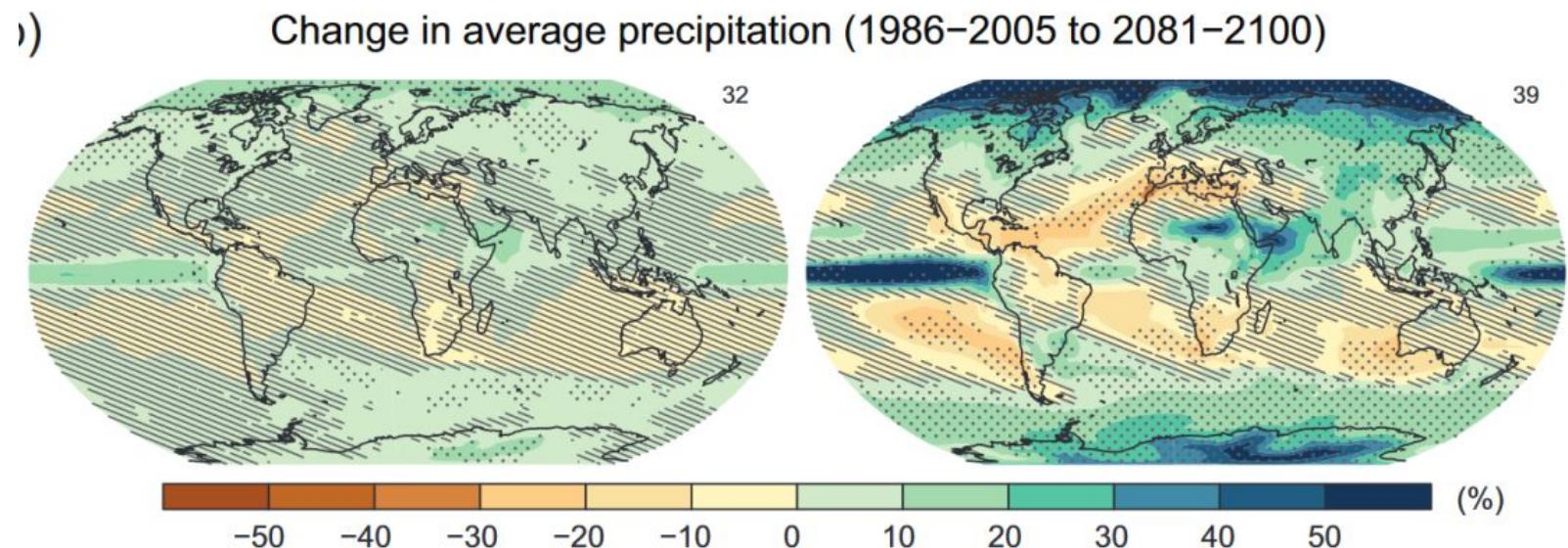


If CO_2 \rightarrow T° \rightarrow Humidity

$$RH = \frac{H_2O_{actual}}{H_2O_{max}}$$



<https://www.e-education.psu.edu/earth111/node/557>





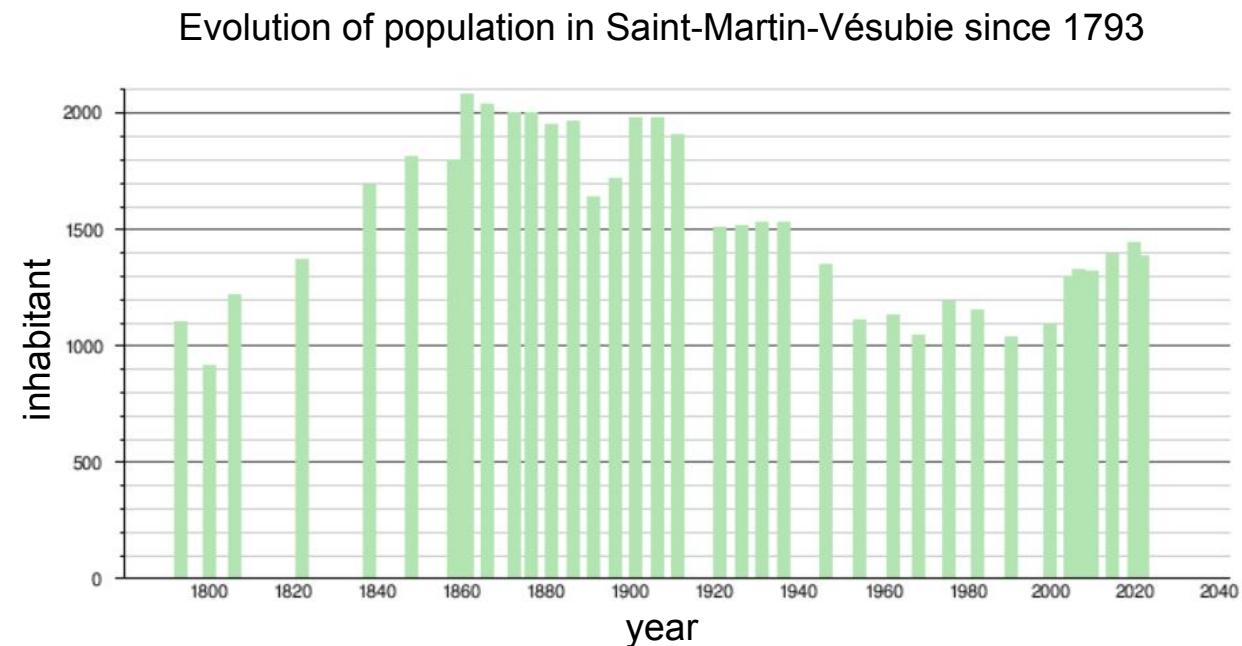
3. Climate change: scenarios

*SSP1-2.6

- “Optimist” pathway
- Global policies to mitigate the climate change
- Low-emission of GHG

SSP5-8.5

- “Pessimist” pathway
- High fossil fuel use
- Fragmented global society
- High emission of GHG



What variable for Saint-Martin-Vésubie?
→ precipitation

*SSP: shared socioeconomic pathway

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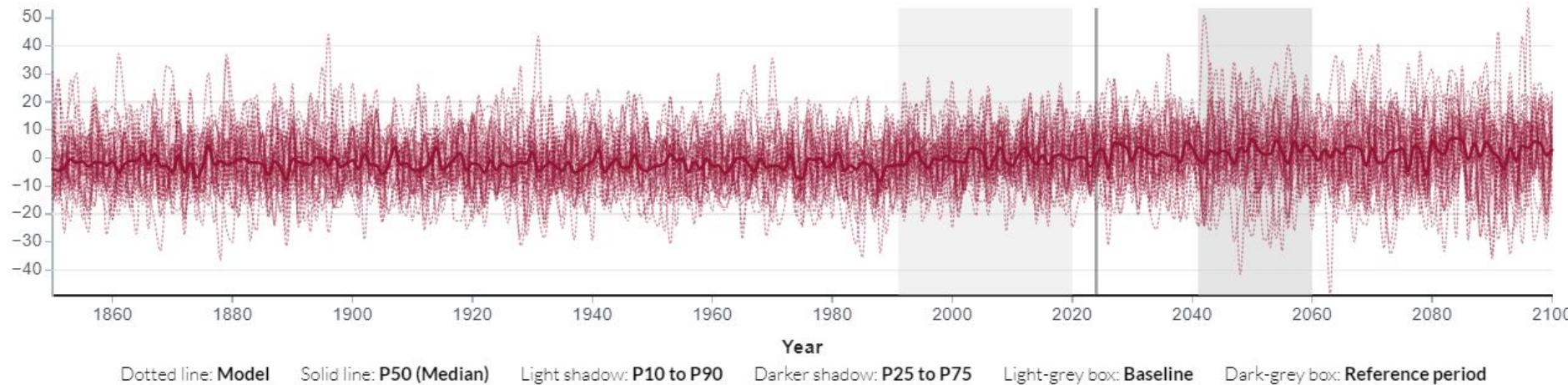
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2. Climate change: atlas

Maximum of 1-day accumulated precipitation (%) - CMIP6 - Relative change - SSP5-8.5 - Medium Term (2041-2060)

- Annual - rel. to 1991-2020

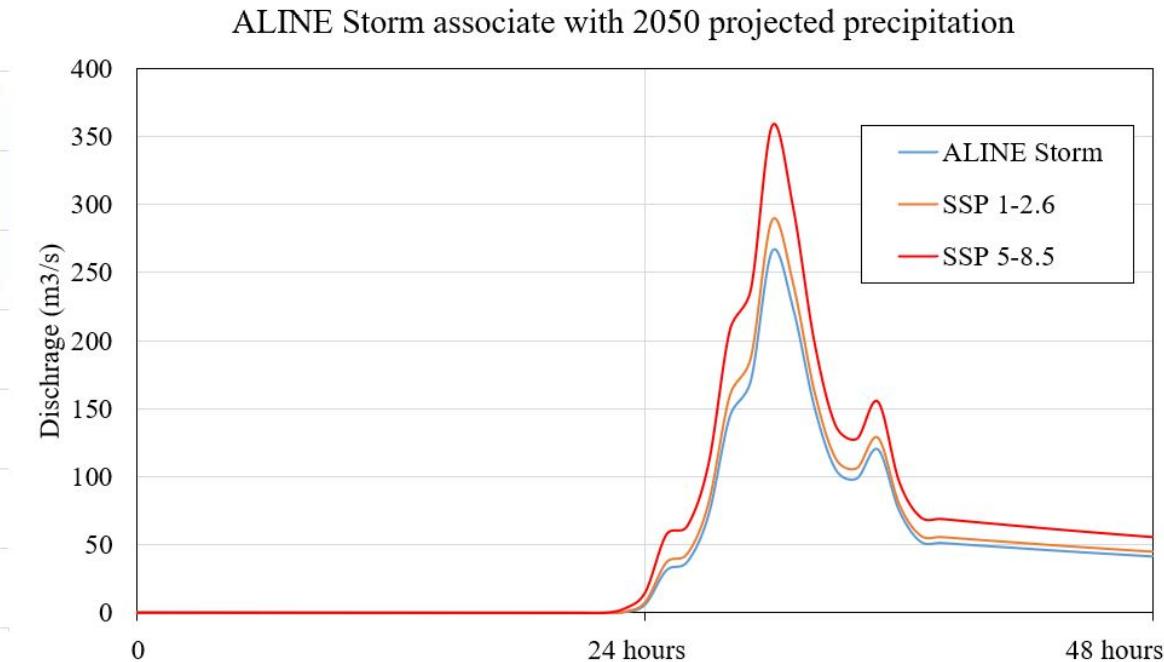
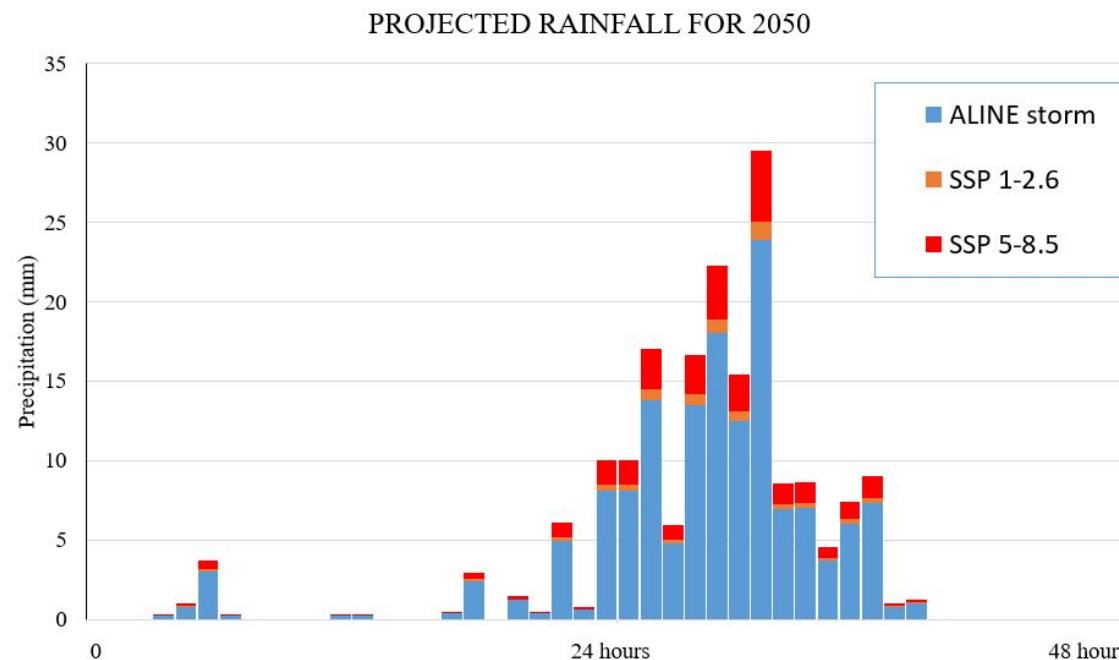


Projected precipitation:
• SSP1-2.6: +5%
• SSP5-8.5: +18%



4. Hydrological model

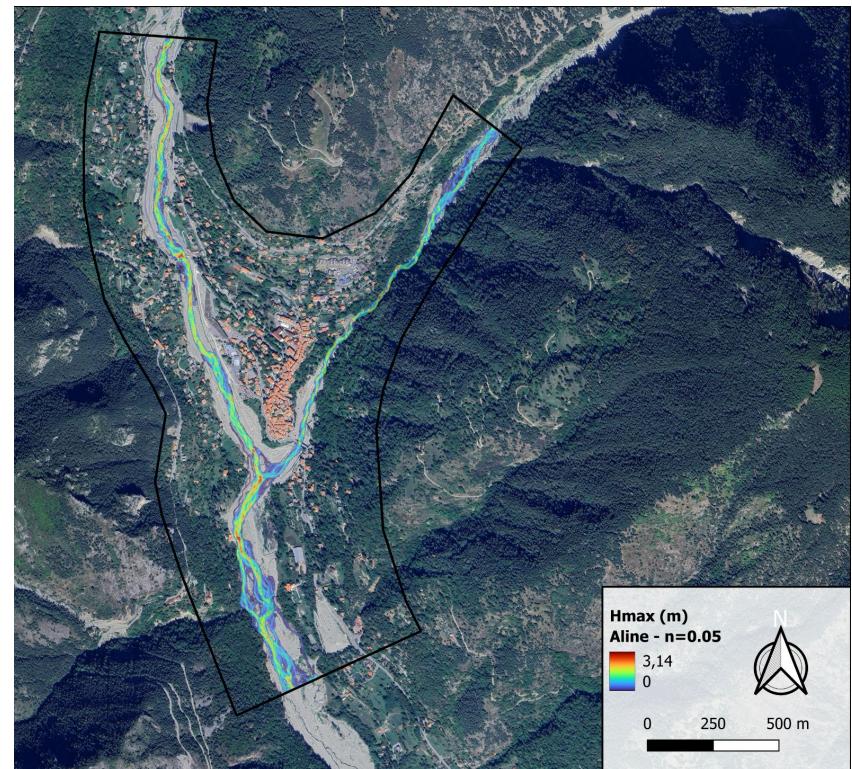
- Projected changes of precipitation are applied to ALINE storm according to scenario SSP1-2.6 and SSP5-8.5.
- Discharge at Saint Martin de Vesubie is simulated with the projected precipitation for hydraulics modelling.



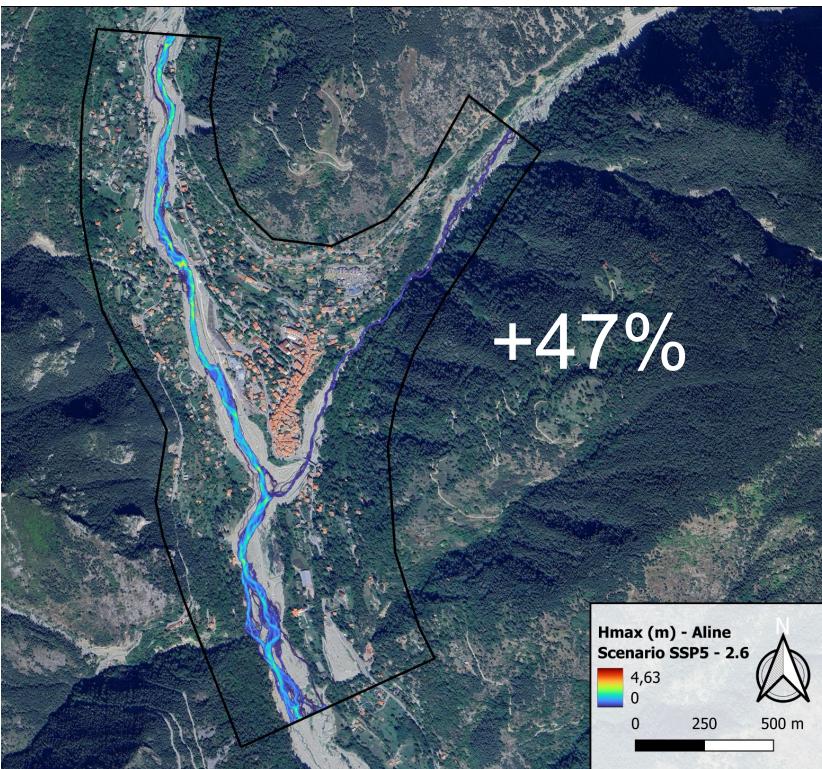


5. Hydraulic model results (max water depth)

Actual state

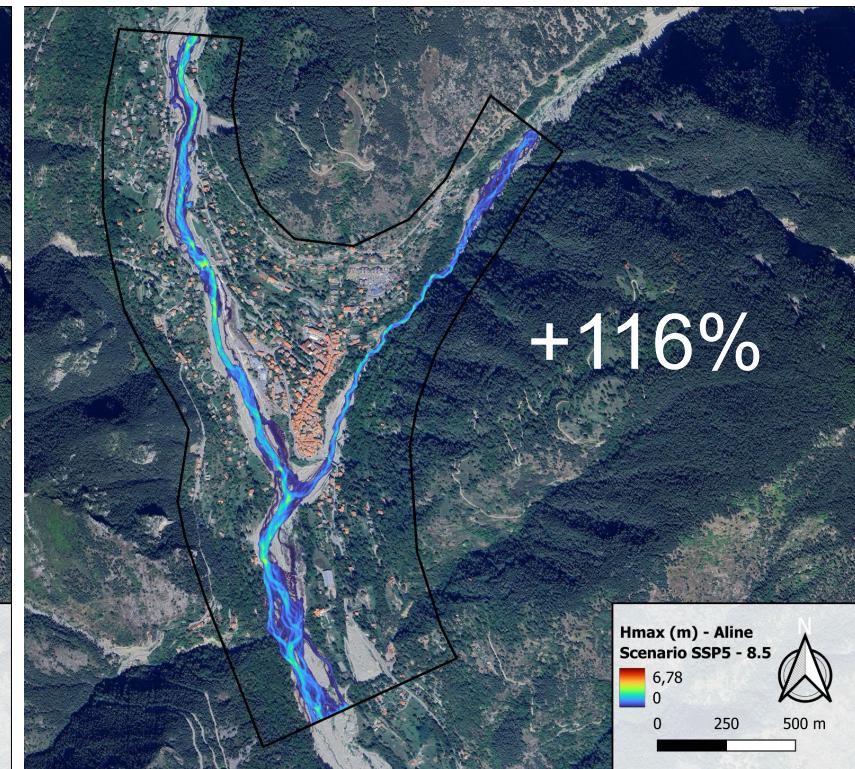


Optimist scenario (2050)



+47%

Pessimist scenario (2050)

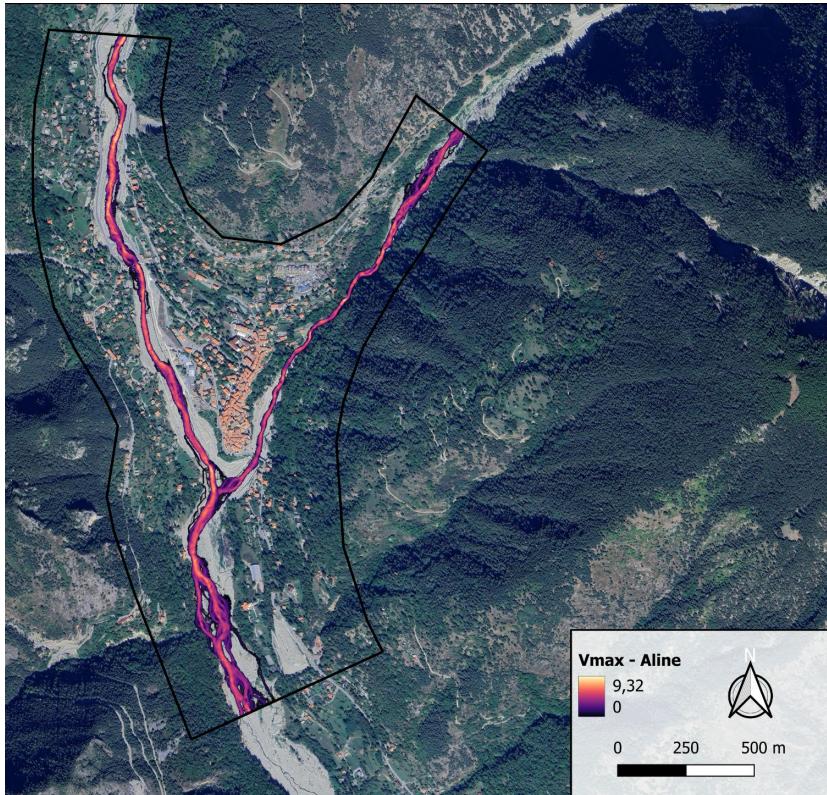


+116%

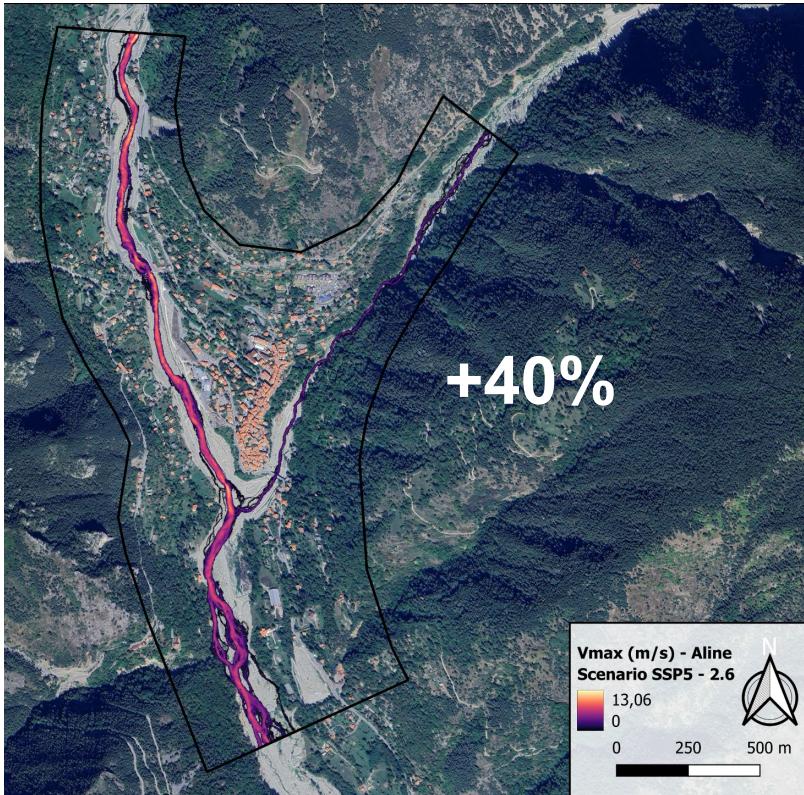


6. Hydraulic model results (max velocity)

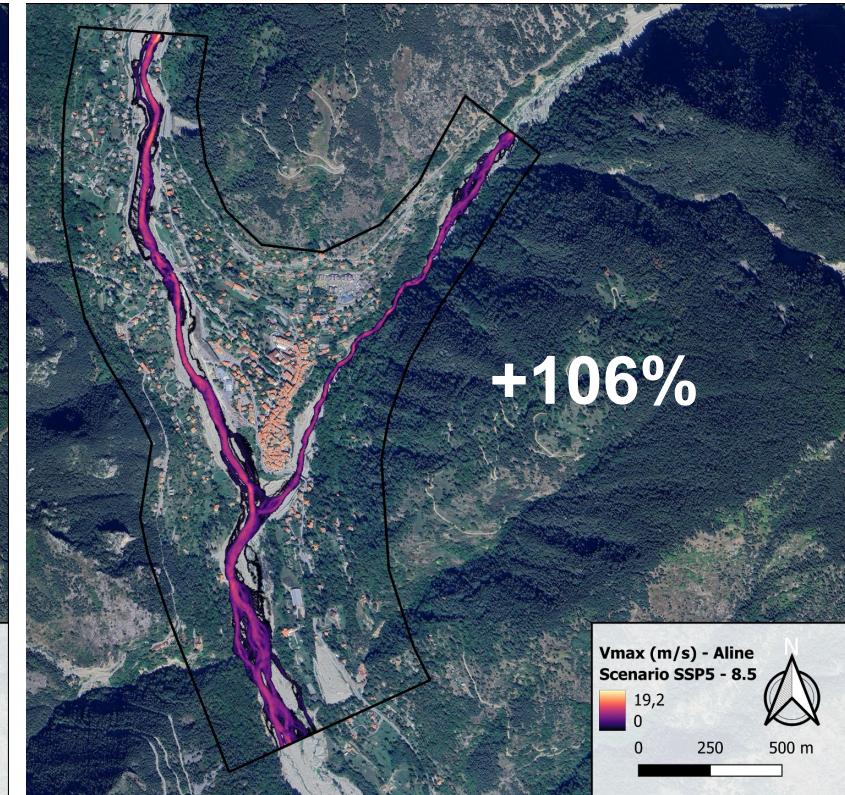
Actual state



Optimist scenario (2050)



Pessimist scenario (2050)



7. Conclusion:



Where to relocate the WWTP?

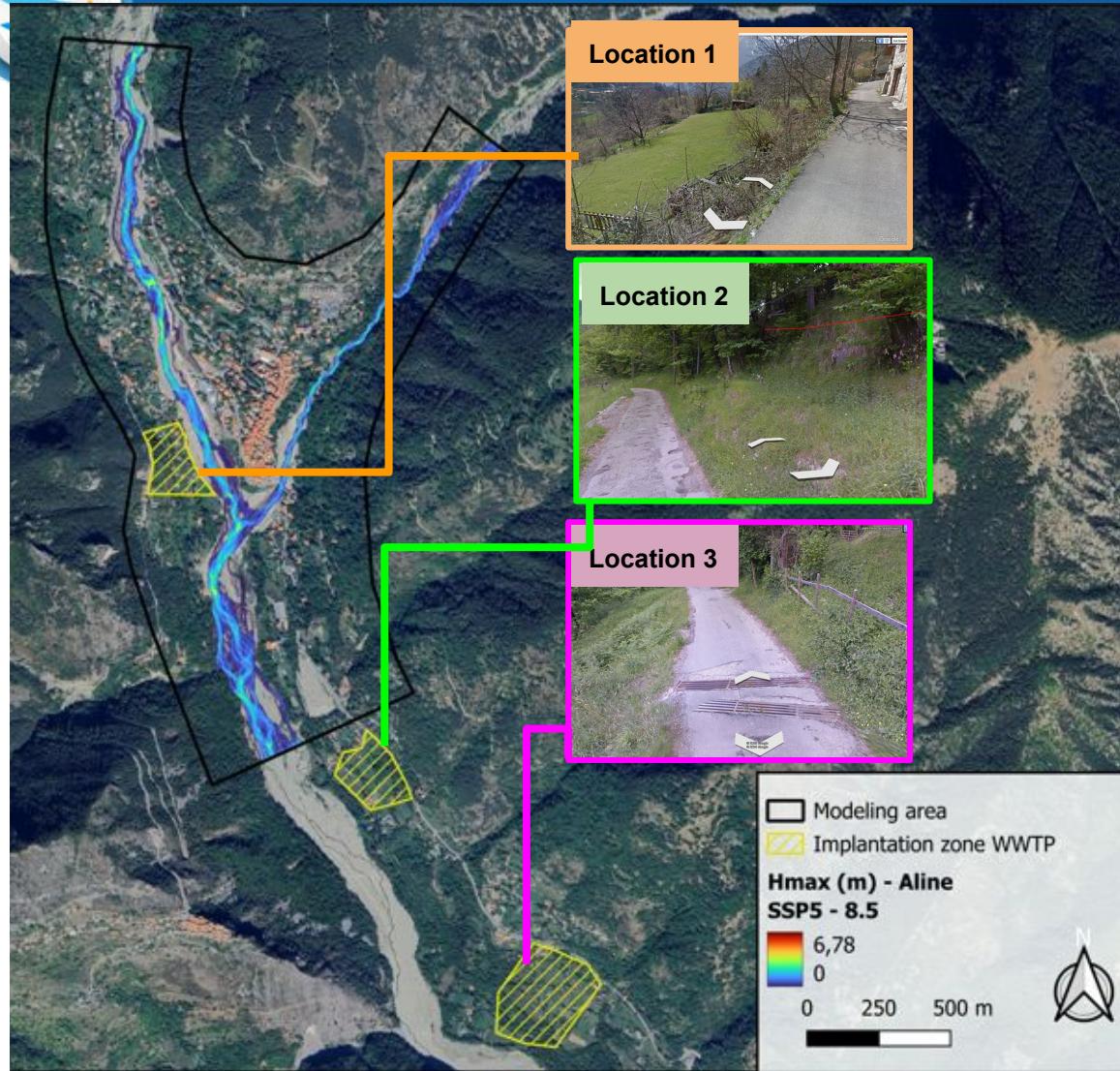
Site Selection Considerations:

- **Modelling Results**
- **Elevation**
- **Accessibility**
- **Landuse**
- **Other Site Conditions**

Criteria:	Location 1	Location 2	Location 3
Elevation	946m	890m	835m
Accessibility	ok	ok	ok
Land Uses	Urban development, residential	Urban development, residential	For agricultural needs, Protected area, urban development
	1. Majority are Rendisol type of soil		
Other site conditions	2. Concerned Stakeholders: -Gubernatis Palace -Chapel of the Holy Cross -Notre-Dame-de l'Assomption Church -Chapel of Mercy or Black Penitents		2. Very far from the existing urbanized area (about 2km)

Recommended is Location 2.

7. Conclusion: Proposed Locations



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Further steps:

- Perform modelling further downstream
- Complete site reconnaissance
- Conduct specific site investigation/studies.
- Consider potential flooding impact in design

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Thank you for your attention

Any questions?

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Appendix

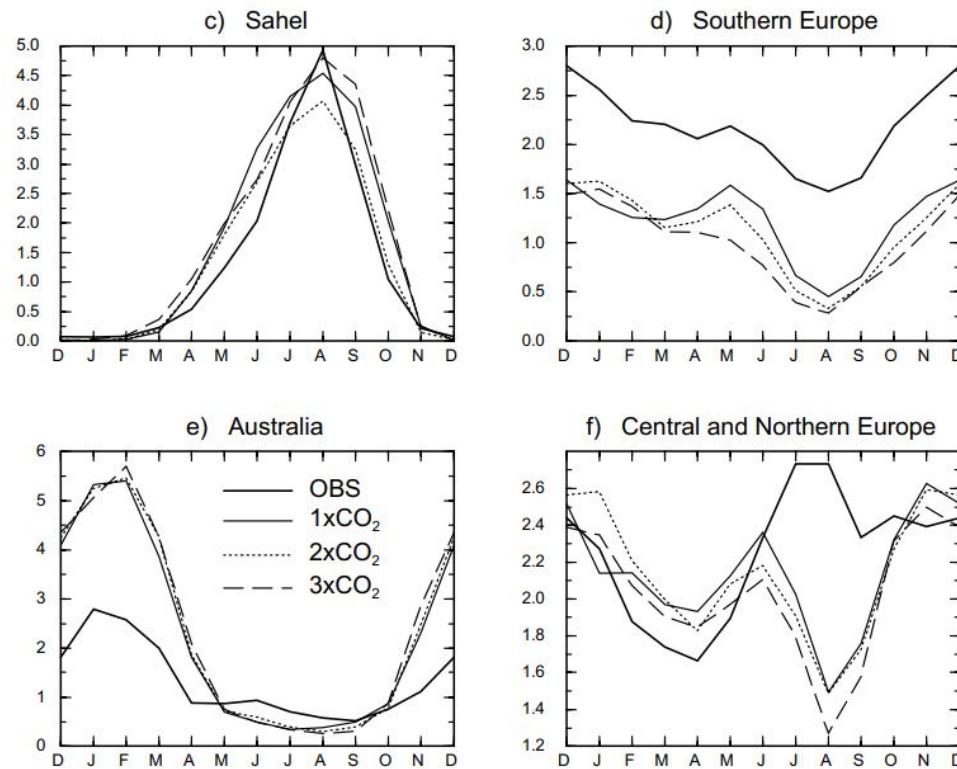


Figure 6. The annual cycle of the precipitation (mm/day) for the observation (bold solid) and the 1xCO₂ (thin solid), 2xCO₂ (dotted) and 3xCO₂ (dashed) integrations for Central North America (a), Southern Asia (b), the Sahel region (c), Southern Europe (d), Australia (e), and Central and Northern Europe (f) (after Cubasch et al., 1995).

Différence du cumul des précipitations (en %) - projection 2071-2100 par rapport à la période 1976-2005
Scénario avec émissions modérées (RCP 4.5)

