



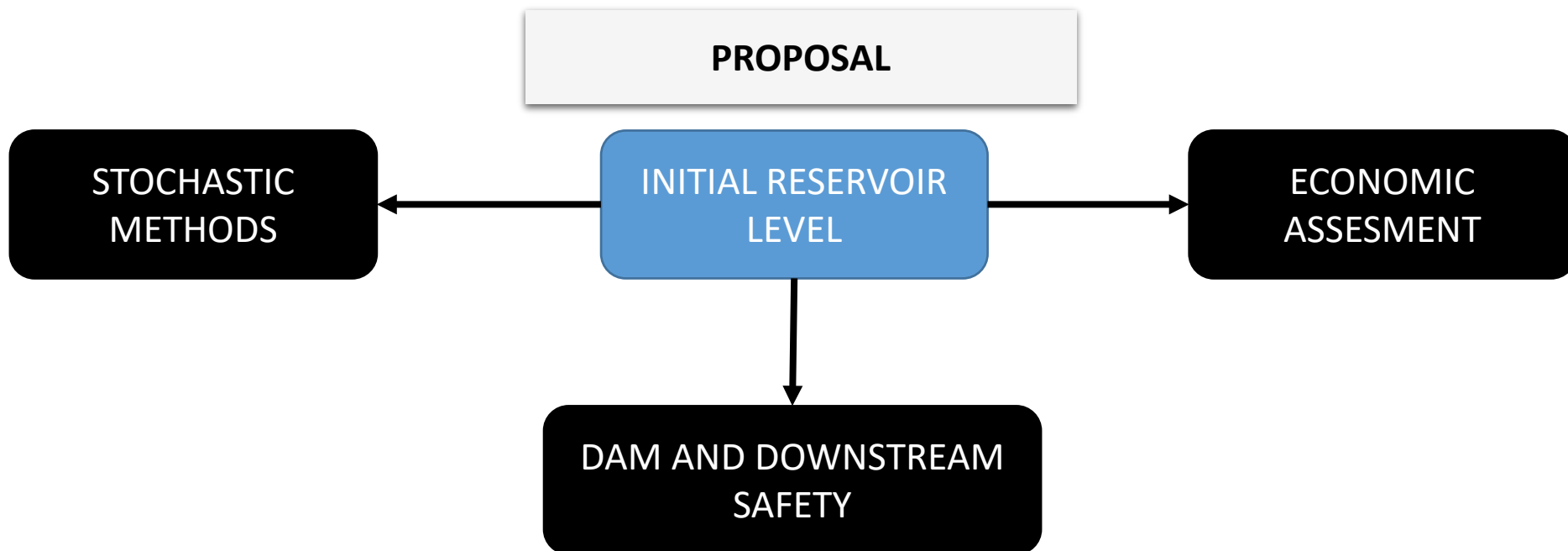
STOCHASTIC ASSESSMENT OF THE INFLUENCE OF RESERVOIR OPERATION IN HYDROLOGICAL DAM SAFETY THROUGH RISK INDEXES

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Introduction

- Failure of Large Dams is a concern in many countries.
- Dam risk assessment has evolved lately. Importance of initial reservoir level.
- Evolution of stochastic methodologies.



Materials and Methods

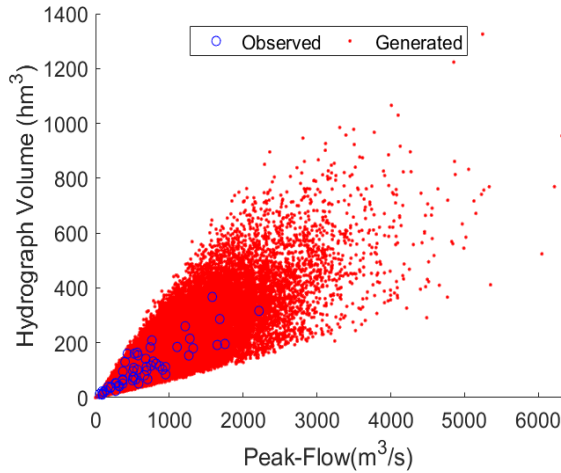
- Generation of synthetic inflow hydrographs.
- Stochastic initial reservoir level assignation.
- Reservoir-Dam system routing.
- Risk-Index analysis.

Applied to a concrete gravity multipurpose dam

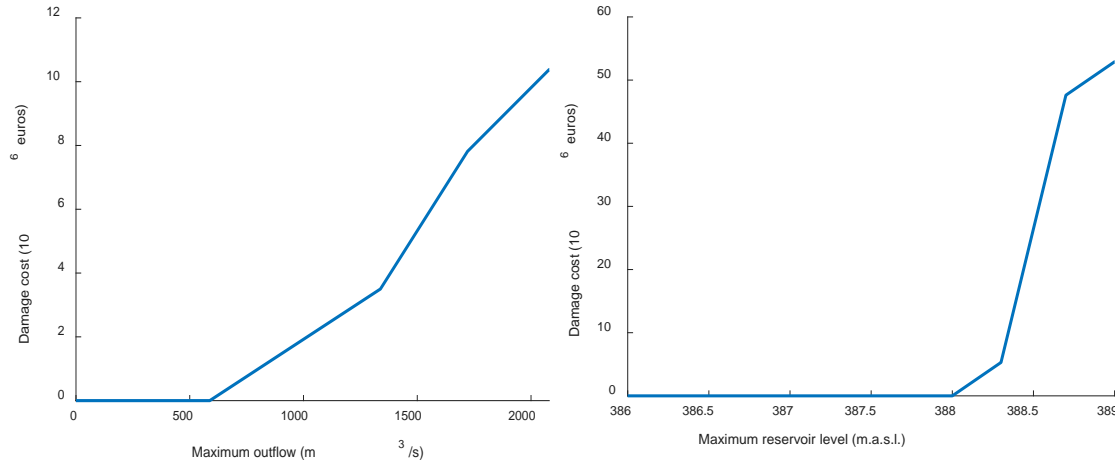
Reservoir Levels (m.a.s.l)		Maximum Outflow Capacity at Maximum Normal Level (MNL) (m ³ /s)	
Maximum Normal Level (MNL)	386	Gated-spillway	2200
Design flood level (DFL)	387		
Crest of dam (COD)	388	Bottom outlet	57

Results and Discussion

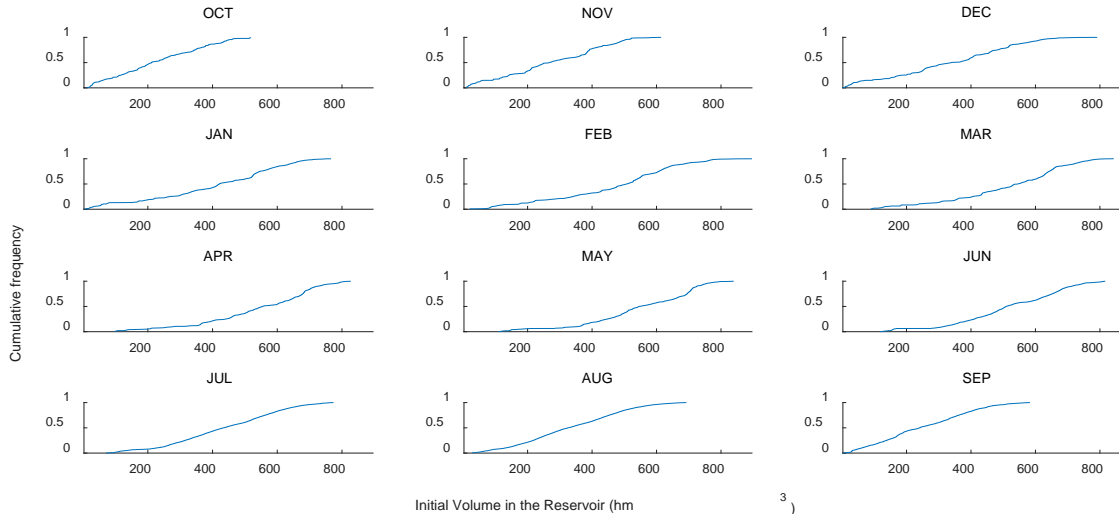
Hydrograph generation



Damage Curves



Initial Reservoir Level



Risk Index

Scenario 1 I_R (10^3 euros)
1445.6
Scenario 2 I_R (10^3 euros)
980.5
Scenario 3 I_R (10^3 euros)
93.0

Conclusions

- For the case study, considering the fluctuation of initial reservoir level provided a more realistic assessment of hydrological dam and downstream safety.
- The global risk index reduced its value up to 93 % if variable initial reservoir level is accounted, from 1445.6×10^3 to a value of 93.0×10^3 euros in the case study.

Acknowledgements

The authors would like to thank the funds from Fundación José Entrecanales Ibarra in the framework of the Program “Support program for research purposes”. The authors acknowledge the computer resources and technical assistance provided by the Centro de Supercomputación y Visualización de Madrid (CeSViMa) and the funds from Universidad Politécnica de Madrid in the framework of their Program “Ayudas para contratos predoctorales para la realización del doctorado en sus escuelas, facultad, centro e institutos de I+D+i” and in the framework of their Program “Ayudas a dirigidas a jóvenes investigadores doctores para fortalecer sus planes de investigación”.

Main References

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