



Theme 4:
Exploitation des aménagements multi-usages
Operating multi-purpose facilities

Chaired by
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Challenges for multi purpose water resource operations

- Mitigating impact of global warming
- Ever increasing development and associated demands
- River basin management (National and international)
- Information and decision making
- Constraints on water resource development



Unique opportunities for multi purpose water resource operations

- Increased flexibility in designs and operations
 - Innovative concepts of hydropower infrastructure adaptation
 - Increasing storage by raising existing and building new reservoirs
 - Innovative solutions to protect fresh water ecosystems and restore river continuity for fish and other species
 - Provision of flexible energy supply also supporting food and water supply



Unique opportunities for multi purpose water resource operations continue

- Optimisation of operations and maintenance
 - Artificial intelligence to advance instrumentation and controls
 - Monitoring systems for predictive maintenance and optimised intervals
 - Resilience of electromechanical equipment
 - Resilience of infrastructure and operations
 - Integrated systems to meet multi-purpose objectives short and long term
 - Optimise the water resource



Unique opportunities for multi purpose water resource operations continue

- Developing new emerging concepts
 - Multipurpose PSP, sea water PSP, marine energy and hybrid power plants
- Environmentally compatible solutions
 - Flow regime management
 - Assessment of environmental flow release
 - Biodiversity protection
 - Improvement of stored water quality in reservoir





Theme 4: Operating multi-purpose facilities

18 papers from 5 countries

- 13 from France
- 2 from Iran
- 1 from Canada, Uganda, USA

Topics covered by the papers :

- **4A.** Hydrology for resource management at short and medium term 4 papers
- **4B.** Tools for operation related decision making including risk management 7 papers
- **4C.** Short, medium and long-term operation simulation and modelling 1 paper
- **4D.** Sharing criteria, trade-off between uses, operation compatibility of add. uses 4 papers
- **4E.** Performance evaluation of asset management methods 2 papers



Papers not presented today

François Lempérière (France)

The paper explores how water reservoirs could be combined to solar plants in sunny countries to allow the development of electrical renewable energy. Different way of energy storages using PSPs are presented with the implementation of twin dams in already equipped rivers or the construction of dams along cliffs.

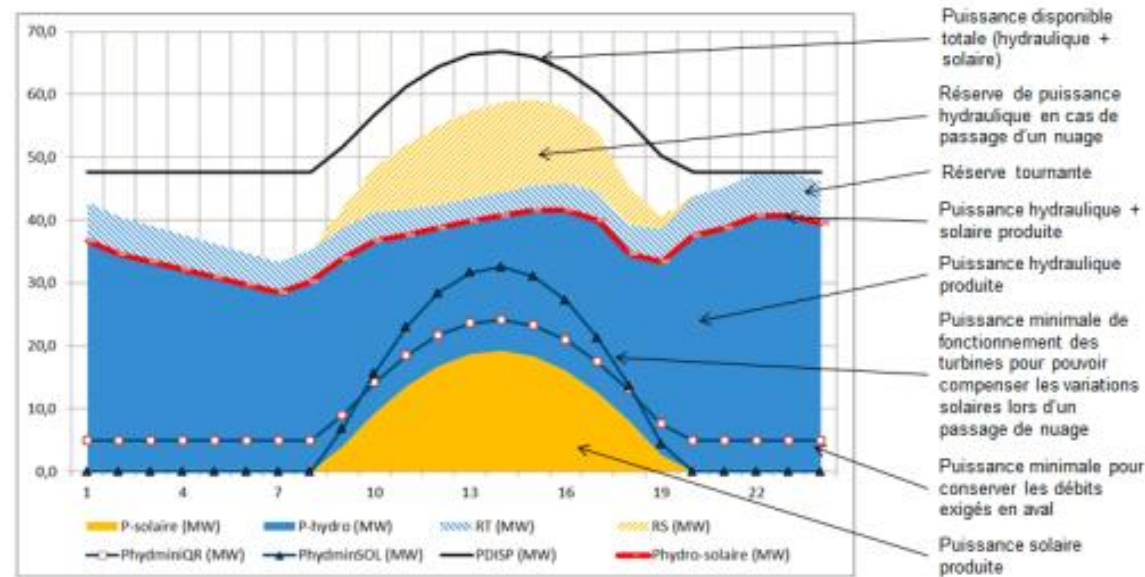
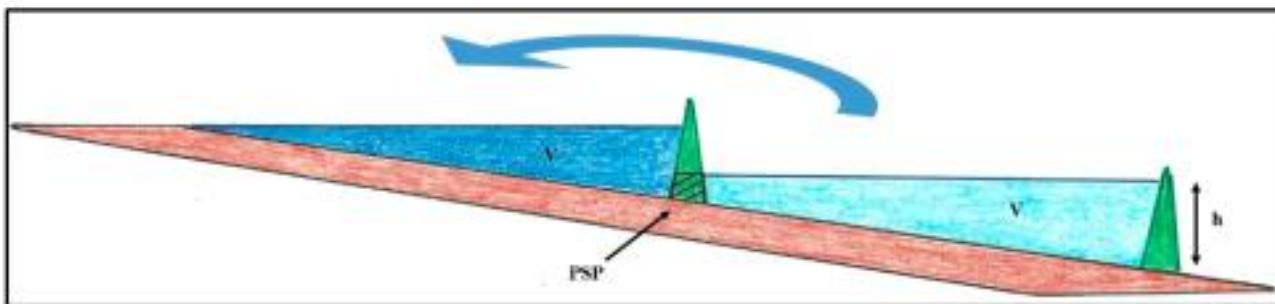


Fig. 3. Exemple des contraintes d'hybridation sur une journée - type [MW].

Marine Bernicot (France)

The paper presents a tool to optimize the coupling between hydro and solar electricity generation taking into account various parameters



Papers not presented today

Jean-Jacques Fry (France)

*Two papers describe how new reservoirs and **innovative use of current reservoirs** will be needed to develop the European Union project “Hydropower as a catalyst for the energy transition” in order for Europe to be the first carbon neutral continent by 2050. Among the multiple uses and benefits of water reservoir storage, the following are promoted: Sustainable transport on the large rivers, prevention of floods and droughts, tourism.*

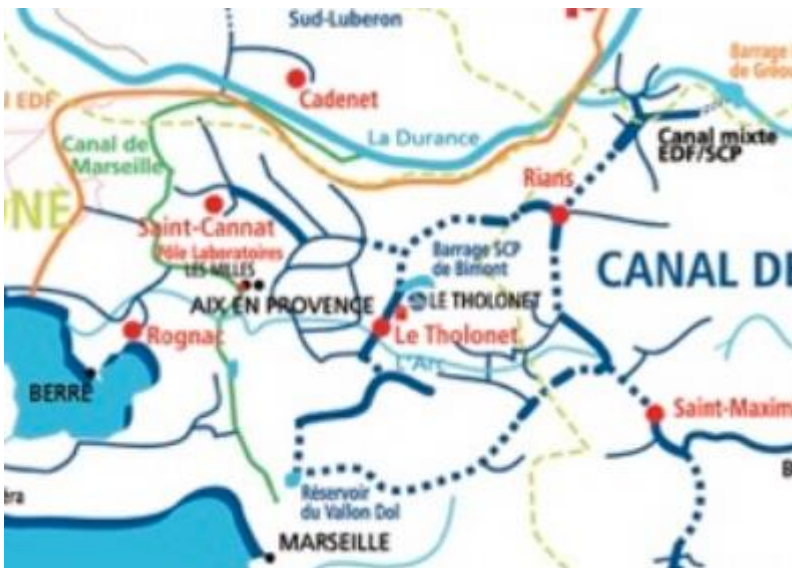
It is highlighted that best practices should be deployed to keep and promote the biodiversity of the freshwater ecosystems.



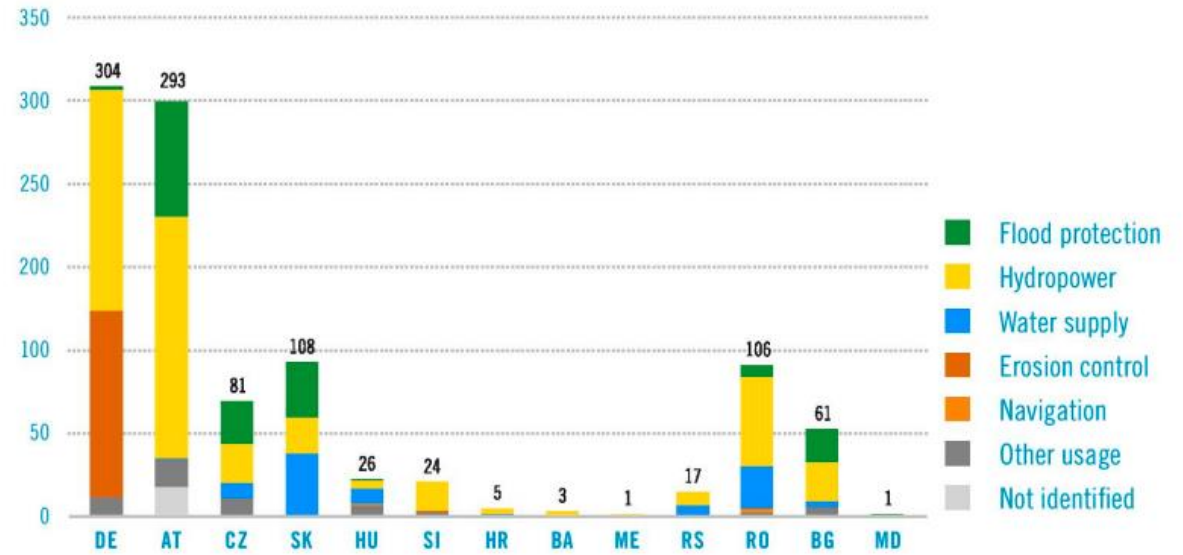
Papers not presented today

Annie Randrianasolo (France)

The paper presents the water sharing of the Durance-Verdon system with active concertation of two independent operators. It has been presented in the morning introduction.



May 30th, 2022



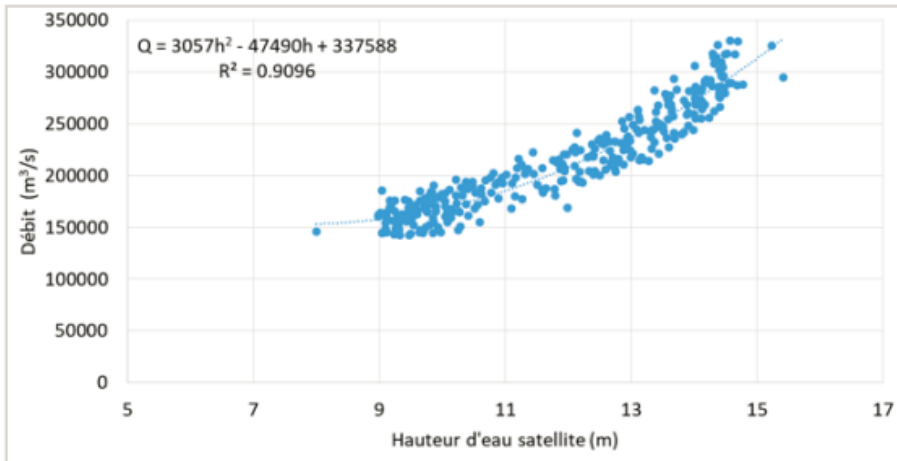
Faghihi Mohaddess Ali (France)

The paper presents a comparison of the water management for 3 wide national and international basins. It emphasizes the need of integrated water resources management plan associated to implementation of large cooperation. It has been presented in November 2021

Papers not presented today

Yoann Aubert (France)

The paper presents the current possibilities and limitations of using satellite data to optimize the monitoring of water resources with examples on Amazone river catchment area.



Vincent Jouve (France)

The paper presents the multi-purpose water transfer project that include 5 reservoirs and 8 pumping stations to allow water supply and irrigation in Algeria

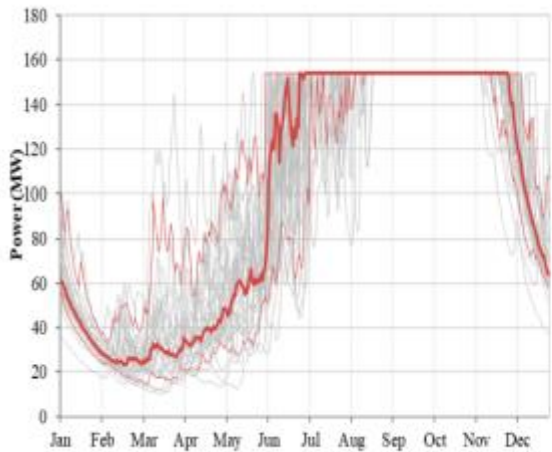


Papers not presented today

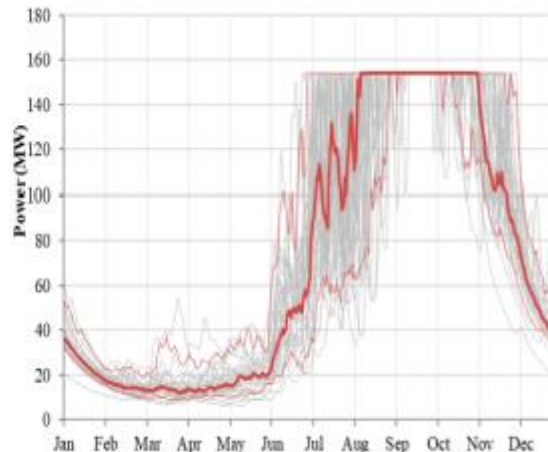
Pierre Yves Bourgin (France)

The paper describes a partial application of the IHA guide on climatic resilience on a dam in Liberia.

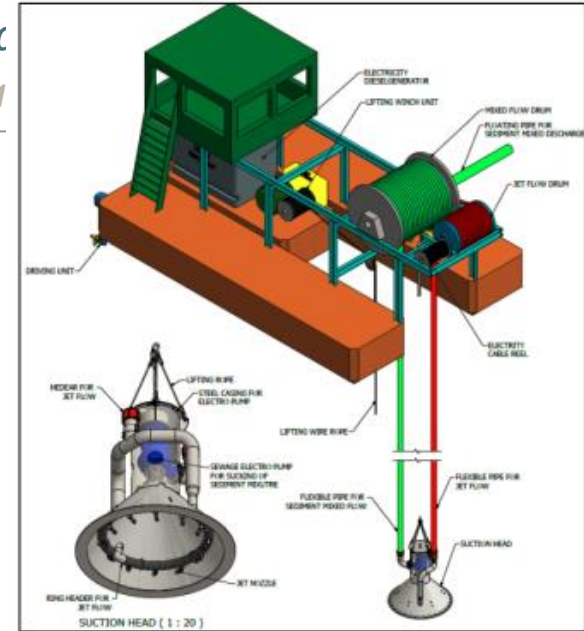
It is presented in the theme 3 session.



2020



Scenario +2°C, -20% rainfall



Ali Ahmad Kianmehr (Iran)

The paper focuses on the management of sediment in reservoirs in order to keep sustainable water resources. It describes an innovative system (applied research in progress) to remove them by suction and jet flow



Programme

- Quels barrages pour l'Afrique sahélienne ?
What dams for Sahelian Africa?
 - Leçons tirées de la gestion des évènements climatiques extrêmes - Le cas du lac Victoria et de la cascade du Nil Blanc
Lessons learnt from dealing with climatic extreme events - A case of L. Victoria and the White Nile Cascade
 - Projet hydroélectrique Red Rock – Nouveau développement hydroélectrique à un barrage anti-crue existant
Red Rock Hydroelectric Project – New hydro development at an existing
- **Michel Lino**, Arnaud de Bonviller, Luc Deroo, France
 - **Wilberforce Manirakiza**, E. Tumwesigye, K. Otim, M. Akurut, H.E. Mutikanga, Uganda
 - **Rachael Bisnett**, Nathaniel Grossmann, Thomas Andrews, Darren Milanowicz, Hannah Maas, USA





Programme cont.

- Comment concilier multi-usages de l'eau et bon état des milieux aquatiques ? L'exemple du Verdon

How can be combined the multiple uses of water and the good ecological state of aquatic environments? The example of the Verdon flood control dam

- **Corinne Guin, Olivier Savoye,**
Vincent Kuleza, France

- Système intégré de gestion de réservoirs à usage multiple au Sri Lanka

Integrated System for Multi-Usage Reservoir Management in Sri Lanka

- **Francois Welt,** Semiu Lawal,
Nimanthi Manjula, Sandun
Galappathi , Sri Lanka



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Thank you
Merci de votre attention

