AFPCN/DKKV webinar
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Flood prevention and protection in Paris region
• **1 - Flood risk in Paris region is a major disaster risk**

• **2 - Some figures about Seine river basin**

• **3 - A complicated governance for flood management in Paris region**

• **4 - Flood protection and prevention in Paris region; many measures already implemented but work still in progress for a resilient city**

• **5 - Public awareness**
• The risk of Seine flooding in Paris region is a major one and the main nature-related disaster that could occur in mainland France (i.e. except overseas).

• In 2014 OECD assessed that a major event could affect up to 5 millions people and cost between 3 and 30 billions euros depending from the level of the flood.

• The last big flood occurred more than a century ago and the 2016 and 2018 recent floodings have confirmed the scale of these figures and supported a new prevention policy with the help of new legislation and progress in governance.

• Climate change shall increase drainage problems linked with more frequent and extreme urban storms.
A major Seine flood in the capital of France could affect directly or indirectly up to 5 millions people and thousands of businesses.

It could disrupt the continuity of the State, many institutions and critical infrastructures’ networks (electricity, water, sewage system, transport, communication,...)
1- Flood risk in Paris region is a major one – 3/4

1910 – Last major flood in Paris
1- Flood risk in Paris region is a major one – 4/4

Two recent floods far below 1910’s level:
• 6,10 m - June 2016
• 5,84 m - January 2018 (lowered by reservoirs)
2 - Some figures about Seine basin – 1/2

• Length: 776 km
• Catchment surface area: 73 700 km²
• Altitude of the spring: 471 m

• The Seine river in Paris
  ▪ Catchment surface area: 43 800 km²
  ▪ Altitude: 26 m
  ▪ Low water flow: 25 m³/s
  ▪ 1910 flood flow: 2 600 m³/s
  ▪ Mean flow: about 300 m³/s
• 12 millions inhabitants in Region-Ile-de-France

• **Urban concentration in the heart of the Seine catchment area**

• At confluency of several important rivers (Yonne, Marne, Oise and Seine)
The Paris region flood management governance is complicated and directly involves many stakeholders operating at a national, regional or local level:

- **SCHAPI** (national service for flood forecasting) operating Vigicrues website [https://www.vigicrues.gouv.fr](https://www.vigicrues.gouv.fr)
- **DRIEAT** (regional State service for DRR) [http://www.driee.ile-de-france.developpement-durable.gouv.fr/prevention-des-risques-d-inondations-r183.html](http://www.driee.ile-de-france.developpement-durable.gouv.fr/prevention-des-risques-d-inondations-r183.html)
- **Secrétariat général de la zone de défense** (regional State service for crisis management) [https://lannuaire.service-public.fr/ile-de-france/paris/sgami-75104-02](https://lannuaire.service-public.fr/ile-de-france/paris/sgami-75104-02)
- **Ville de Paris** for land use mapping, public awareness and local protection measures
- **Departments surrounding Paris** for public awareness and local measures
- **Métropole du grand Paris** for flood management (especially for local protections) [https://www.metropolegrandparis.fr/fr/GEMAPI](https://www.metropolegrandparis.fr/fr/GEMAPI)
- **EPTB Seine Grands Lacs** for reservoirs and basin management including increase of public awareness [https://www.seinegrandslacs.fr](https://www.seinegrandslacs.fr)
- **Utilities** (public transport, energy, telecommunication network, etc...)
- **Etc...**
With the help of Flood directive and OECD peer review recent progresses have been made:

- The Prefecture of the Region (in charge of prevention) and the Police Prefecture (in charge of crisis management) are working well together and have clarified and coordinated the organisation of the State’s actions and of the local authorities and utilities.

- A local flooding management strategy for Paris region has been approved in 2016.

- Implementation since 2014 of a multi-stakeholders Flood prevention action programme (PAPI).

- Sequana EU exercice in 2016 (3 months before the flood) successfully helped all the private and public stakeholders (87) to work together and to know each other.

- 2016 and 2018 floods have increased public and politicians awareness.
Since last century, many buildings were built in flood prone areas and many networks underground and it is now very difficult to « protect » them against flooding.

Reservoirs and local protections

Preparedness measures
Land use planning ; room for the river
More integrated actions adapted to climate change
Towards a resilient city

Many measures have already been implemented but work is still in progress!
Paris city developed a lot since last century and is today very vulnerable.
The city was developed underground and in flood prone areas.
A 20-year return period flood (as June 2016) causes damages of more than 1 billion euros showing that in the current situation (with reservoirs and local protections) a 100-year Seine river flood protection is unreachable in Paris; the operational short-term conclusion is that « you must live with flooding », avoid human casualties, reduce economic losses, increase city resilience and the storage capacity of upstream reservoirs (la Bassée).
4 - FOUR RESERVOIRS UPSTREAM
FOR FLOOD PROTECTION AND DROUGHT MANAGEMENT

**LAC-RÉSERVOIR MARNE**
- Superficie : 4 800 ha
- Capacité : 350 M de m³
- Mise en service : 1974

**LAC-RÉSERVOIR AUBE**
- Superficie : 2 320 ha
- Capacité : 170 M de m³
- Mise en service : 1990

**LAC-RÉSERVOIR PANNECIÈRE**
- Superficie : 520 ha
- Capacité : 80 M de m³
- Mise en service : 1949

**LAC-RÉSERVOIR SEINE**
- Superficie : 2 300 ha
- Capacité : 205 M de m³
- Mise en service : 1966

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Plaine de la Bassée aval, territoire du projet
4 - A new reservoir planned for flood protection
4 - Local protection
4 - Local protection

Removable flood protection of AFD

Inflatable flood protection of Radio House
4 - Local protection

Removable flood protection of an electric transformer

Protection of a subway entrance
Preparedness measures (e.g. SEQUANA or PLOUF)

Land use planning; room for the river in the city and in the upper part of the basin

More integrated actions adapted to climate change

Towards a resilient city
EU SEQUANA 2016 exercise
Co-financed by the European Union

ET SI LA SEINE SORTAIT DE SON LIT?
PLOUF 75
SAMEDI 14 JUIN 2014
BERGES DE SEINE
PORT DU GROS CAILLOU
75007 PARIS
© ALMA MARCEAU
RETROUVEZ-NOUS SUR WWW.PLOUF75.FR

PREPAREDNESS
A new relation between the river and the city is being developed, based on international experience; restoration of wetlands and of flood spreading areas are in progress in the upstream Paris; the 2024 Paris Olympic Games shall also be an opportunity with the building of eco-districts.
• Flood management is a part of the Integrated River Basin Management: flood and drought management are linked and must also include biodiversity preservation and restoration.

• Priorities in Paris region for flood prevention are:
  - resilience of critical infrastructures
  - reduction of economic losses
  - development of public awareness

In the climate change context, solidarities are going to be developed between Paris region and rural areas upstream.

Coordination between prevention and crisis management, and between all the stakeholders shall be also deepened.
To develop flood awareness is a very important and difficult issue in a city of 10 millions inhabitants where the last major flood occurred more than 100 years ago and must be a long lasting process supported by many stakeholders.

https://episeine.fr

3 D videos Institut Paris région
https://www.institutparisregion.fr
To know more about flood management in Paris region:


Thank you for your attention!