Dam removal in Europe

When dams becomes old

by Roberto Epple , European Rivers Network (ERN)

Vézins Dam (Sélune River, Normandie, France to be dismantled (36m / 278 m)

Europe:
5,000 large dams
(mostly Run of Hydropower stations + reservoirs)

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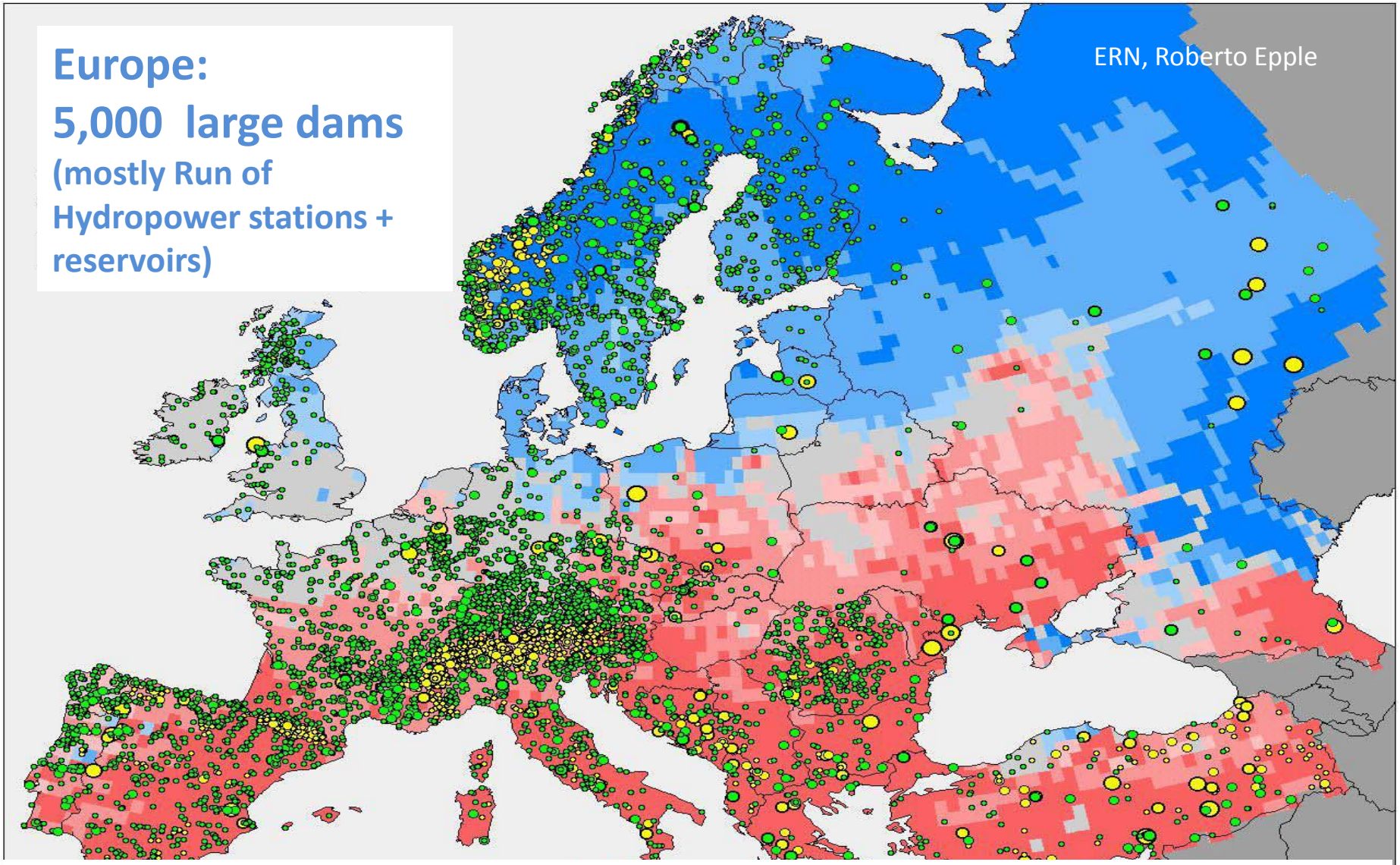


Change in discharge volume in %

decreases *small changes* *increases*

. . . - 25 - 10 - 5 + 5 + 10 + 25 . . .

Run-of-River Station

0.004 MW

3600 MW

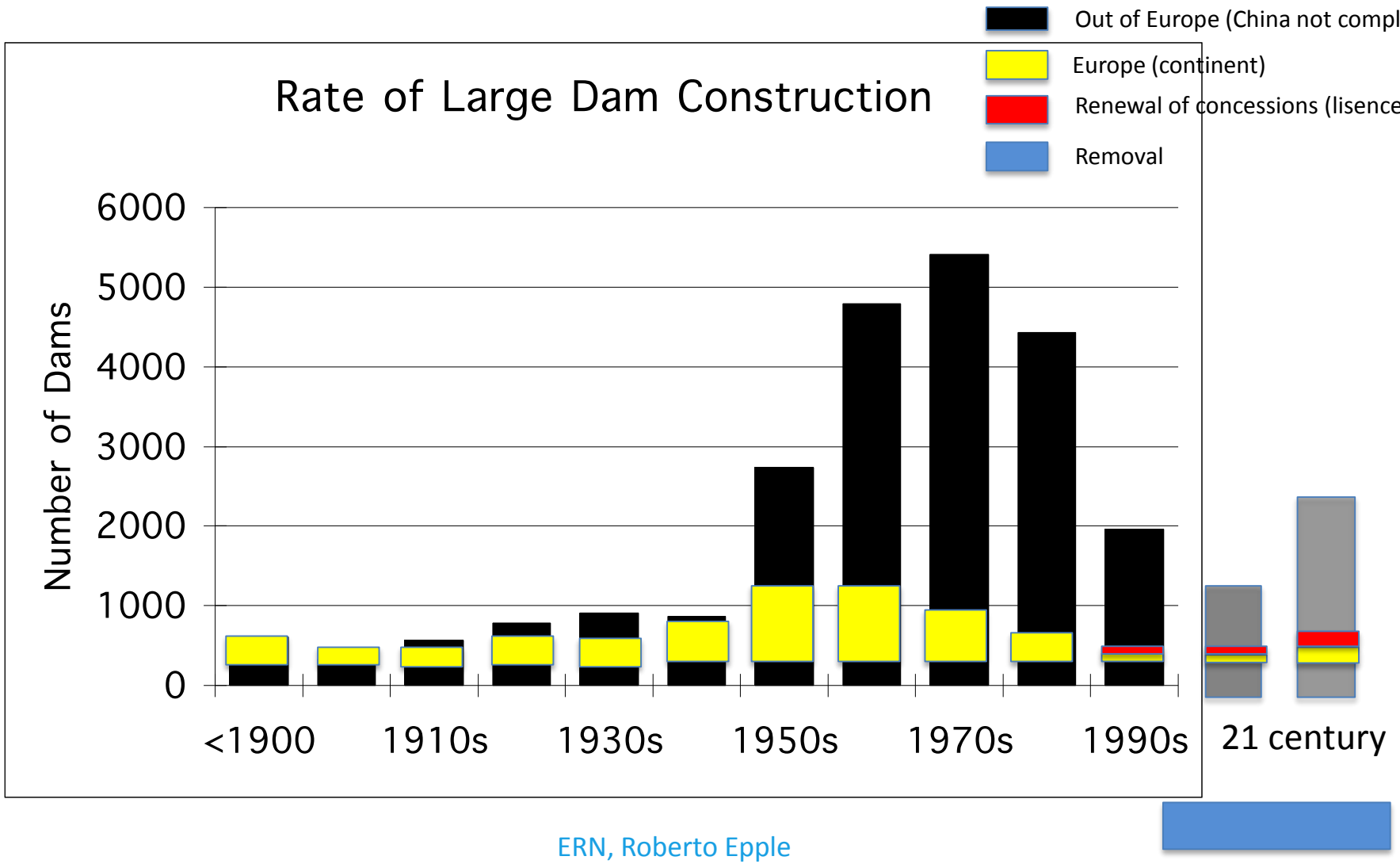
Reservoir

0.004 MW

3600 MW

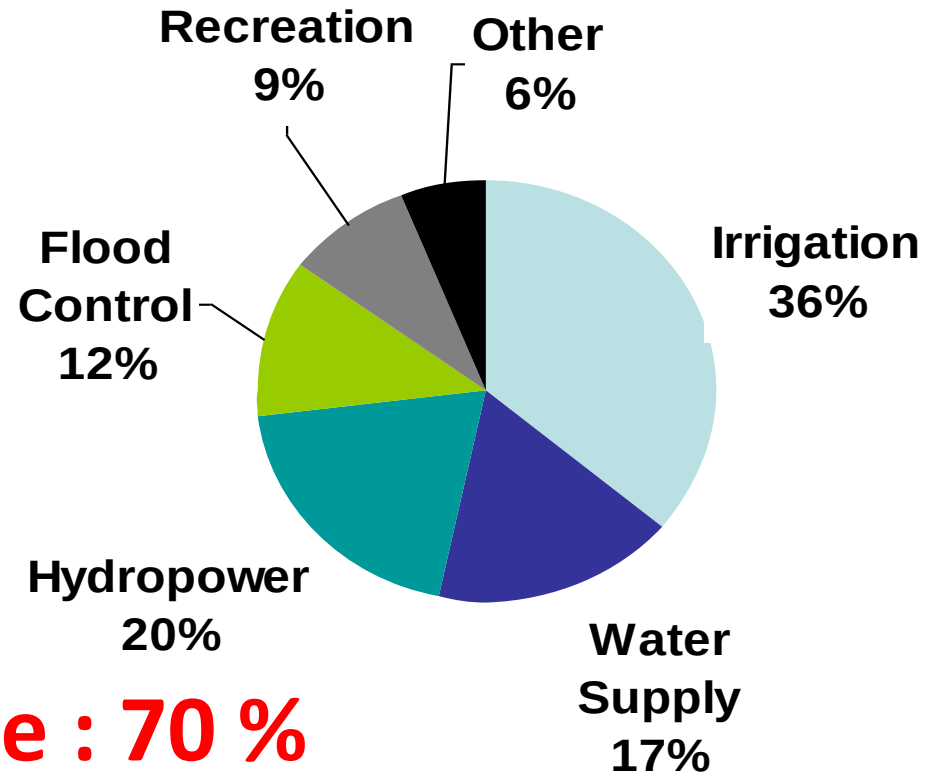
2016 : Worldwide more then 50,000 large dams (> 15 m high)

(Europe : 5,000)



Use of dams worldwide

Dams provide services



Europe : 70 %

Hydropower

Dams have severe negative environmental and social impacts

Interruption of the ecological continuity :

- Blocking the Fish migration
- Loss of Biodiversity
- Lack of sediment downstream of dams
- deepening of the river bed, ground water level sinks
- increasing flood impact downstream
- disconnection of lateral water body

Example: Rhine River: No more salmon wild salmon, Speed of water flow between Basel and Karlsruhe has doubled, Water retention is reduced

Increasing Erosion of the coastline

Example : strongly damned Rhone River :
Loss of 2 - 10 m land/year along the Camargue coastline (Rhone Delta)
Saint Marie de la Mere will become an island (Lack sediments - rising sea level)
Ebro River Delta

Increasing water temperature in the reservoirs an the rivers

- eutrophication impacting water quality and ecosystems

Displacing Millions of humans worldwide

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Flooded Village, Yeza Reservoir in Spain.

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Primary Reasons for Dam Removal

1) **Ecological Restoration**
   - **Restoration of resident and migratory fish passage**
   - **Improved water quality (DO/temperature)**
   - **Natural sediment release and transport**
   - **Restoration of riverine vs. reservoir environment**
2) **Safety Concerns**
   - **Eliminate threat of dam failure**
   - **Eliminate potential loss of life**
3) **Economic Reasons**
   - **Eliminate dam owner liability**
   - **Cost-Effective**

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1802 Puentes Dam, Spain (Murcia) 608 victimes,
1864 le Dale Dyke en Grande-Bretagne (Sheffield), 240 victimes
1928 Gleno Dam, Italie, 500 victimes
1959 Malpasse (Fréjus) France, 423 victimes
1983 Vajont Dam, Italie, 1 900 victimes

Total of 3,651 victimes in Europe (major catastrophe only)
25,000 victimes worldwide (without China with may be 100-300 000 v.)

Dam de-commissioning Chronology

First Removal of large dams

1996-98 France:

Kemansquillec dam, Léguer River, Bretagne (Côte d'Armor), 15 m

Saint Etienne de Vigan Dam 17m (Loire Allier)

Maison Rouge Dam 4-6 m, 200m long (Loire Vienne)

1999 USA:

Edwards Dam, Kennebec River, Maine

Ward Paper Mill Dam, Prairie River, Wisconsin

All of them for salmon restauration and safety reasons

Salmo salar

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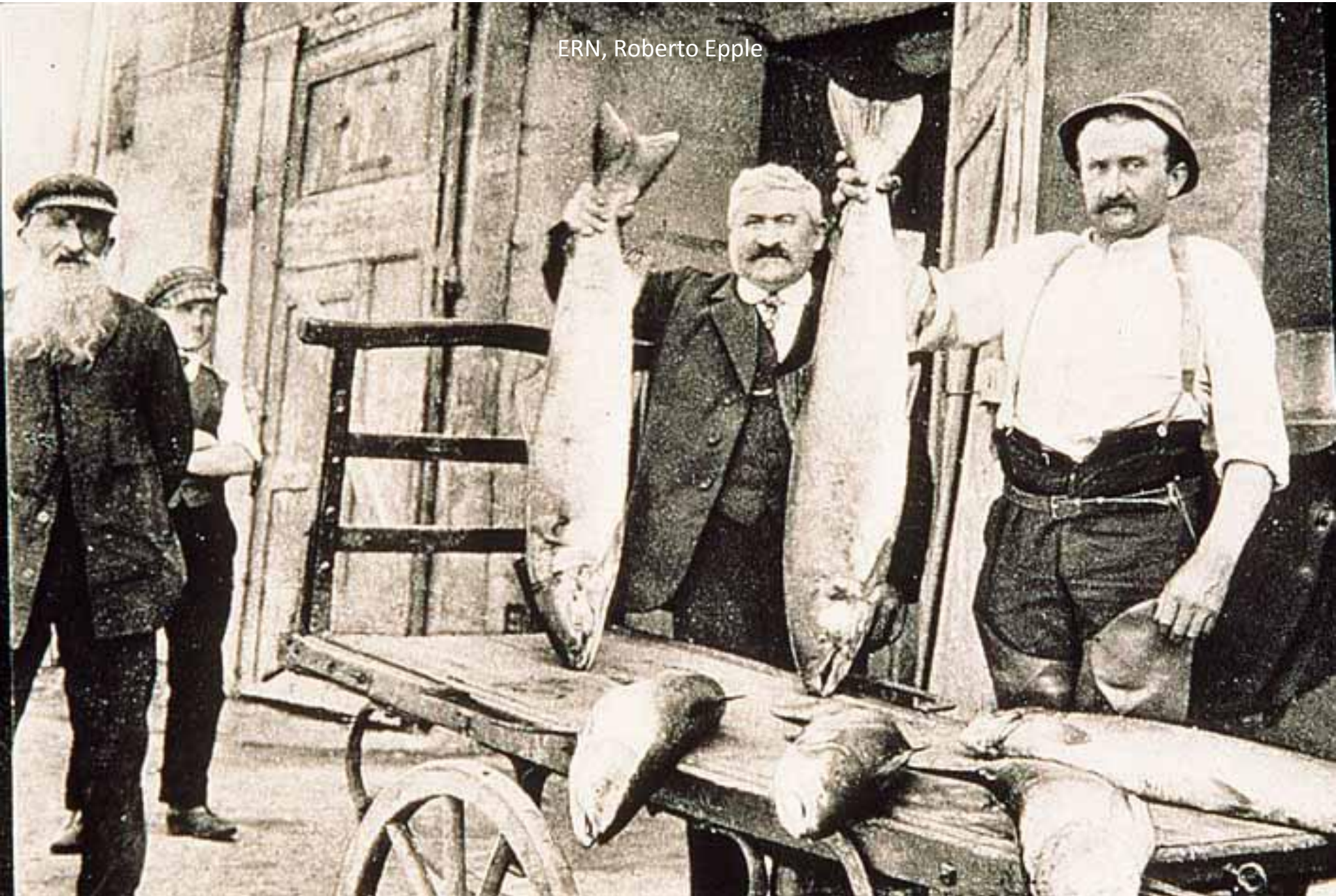
Upper Loire River (Brioude, France) 100,000 salmon in 1905



First removed large European dam (17m)

Saint Etienne de Vigan dam, Allier River (Loire tributary), Copyright SOS Loire Vivante – ERN

25 June 1997 17:00h.

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Minutes later

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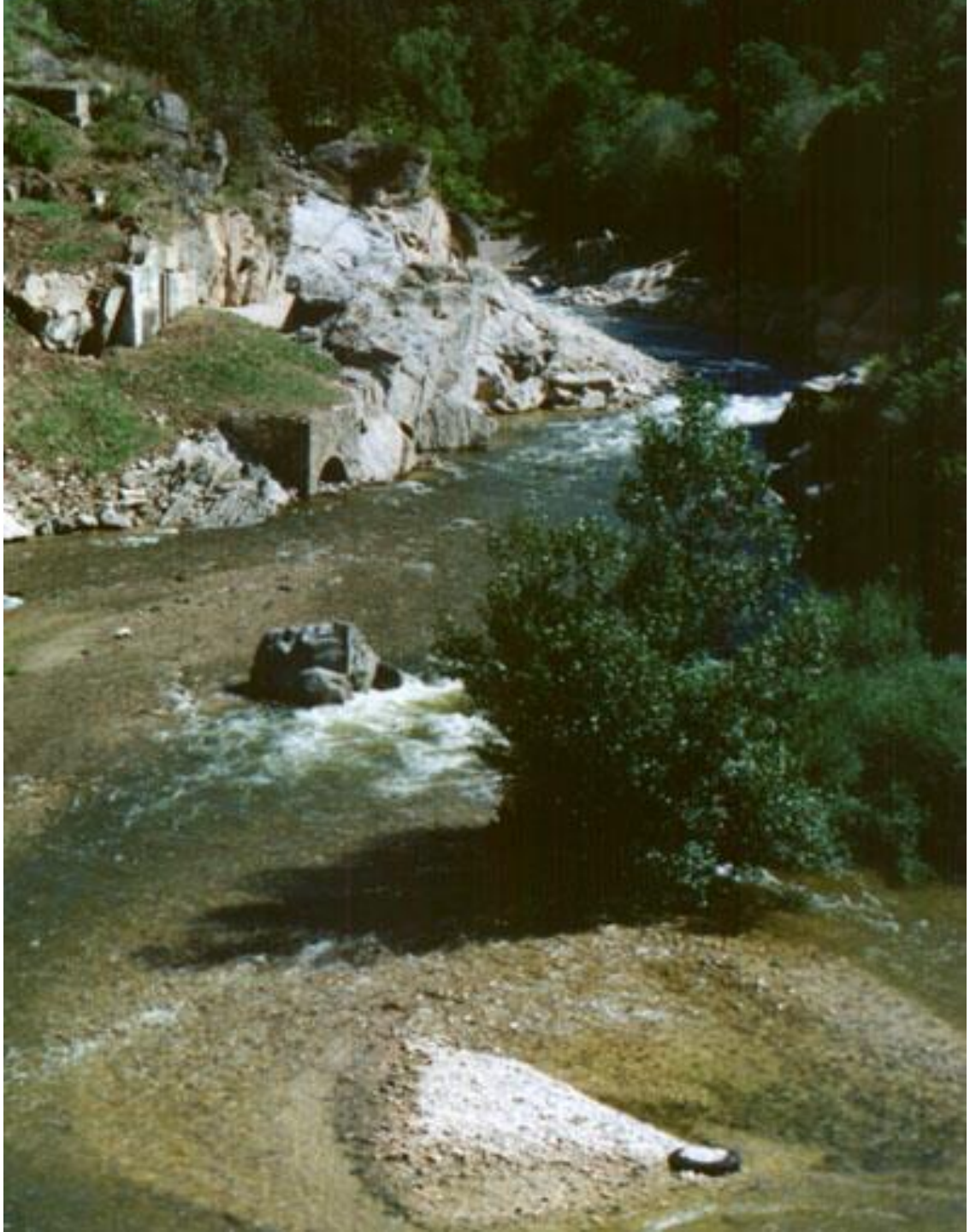
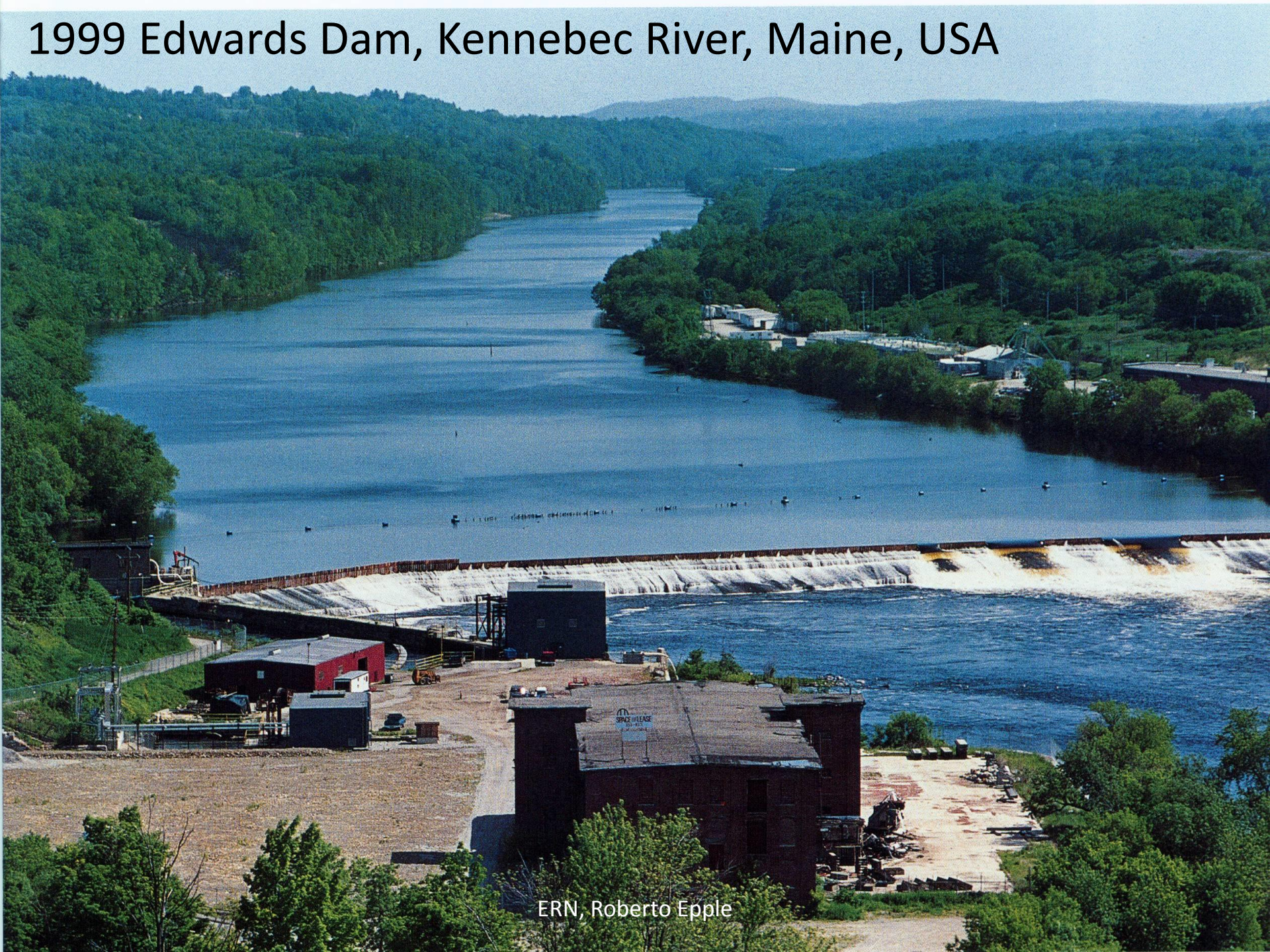


6 months later

1999 Edwards Dam, Kennebec River, Maine, USA



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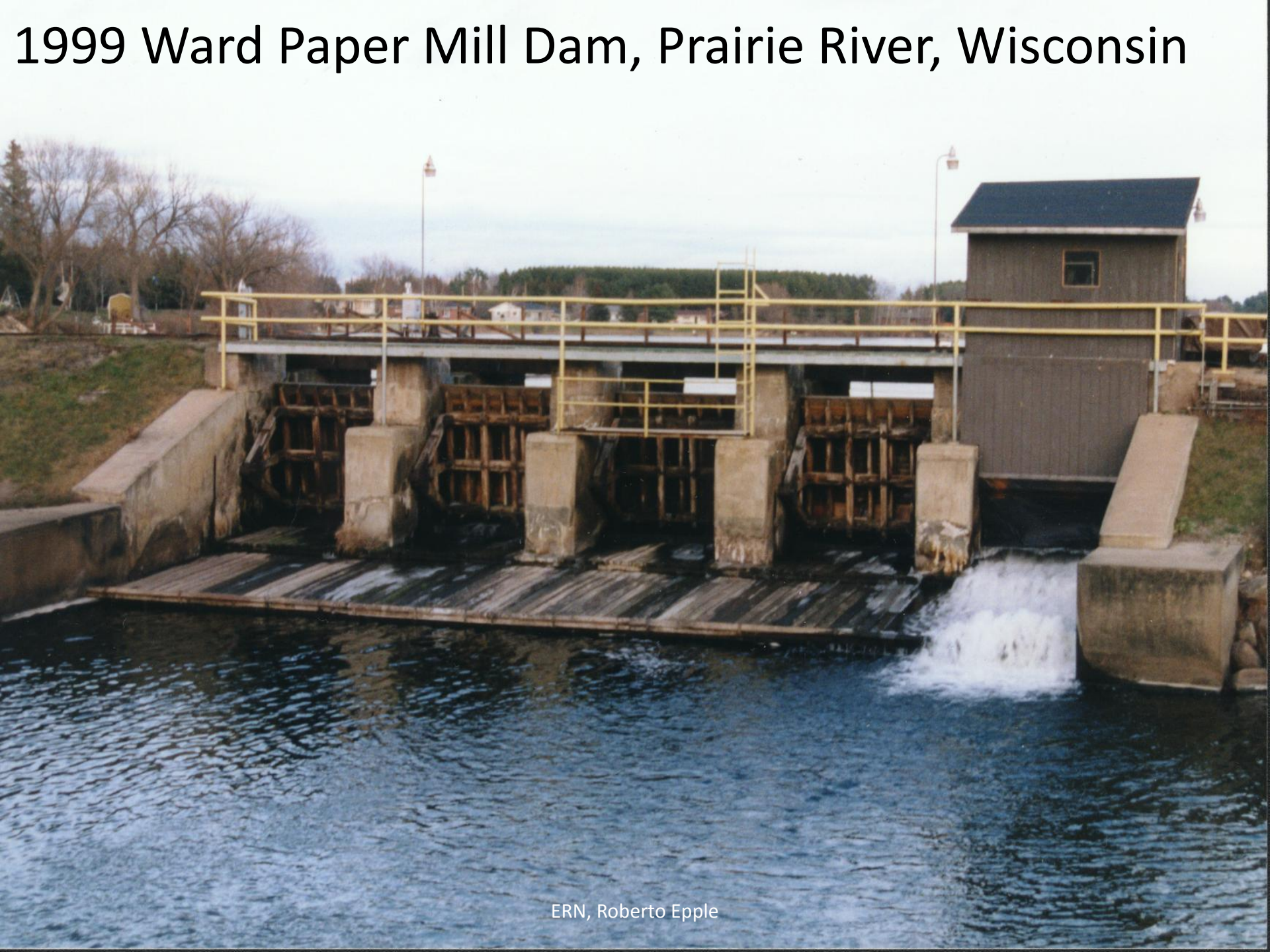
1999 Ward Paper Mill Dam, Prairie River, Wisconsin



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2000 Launch of the EU Water Frame Directive
(boosting the work on the ecological continuity)

2000 - 2017 In whole Europe around 40 large dams are removed, especially in Spain, Sweden, France). In 2015 France decides to redesign a large dam (including a partial removal)

2008 Dam removal as a solution to restore rivers is presented and discussed during the Zaragoza World Exhibition in Spain

2008 Important national plans are launched to remove small obstacles (ex. France : 2,700 obstacles)

2015 Estimated 3,500 small obstacles have been removed in Europe

2016 Launch of the European Dam Removal Mouvement

Next step in France : the 36 m high Vézin Dam

Vézins Dam (Sélune River, Normandie, France, to be dismantled (36m / 278 m)

Soon in France :

After a 25 year long fight by Loire vivante/ERN :

The partial demolition of the Poutès Dam (Upper Allier, Loire River Basin, France) is planned in 2017

Partial removal :

- from 20m to 3.8m hight
- Construction of a fully removable gate
- Fish ladders and equipment for the downstream migration

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De-damming is a powerful tool for river restauration!

Let’s do it !