SIAAP
Sanitation for Greater Paris

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The Seine river in Paris…


ROYAUME-UNI
BELGIQUE
ALLEMAGNE
Manche
50°N
Somme
Oise
Seine
Aisne
Marne
LU
Meuse
Moselle
Rhin
Seine
Vilaine
Mayenne
Sarthe
Loir
Loire
Cher
Saône
Doubs
SUISSE
Océan Atlantique
46°N
Loire
Allier
Saône
Rhône
Charente
Vienne
Isère
ITALIE
Dordogne
Golfe de Gascogne
Durance
Garonne
Rhône
M.
Golfe du Lion
Mer Méditerranée
0
100 km
ESPAGNE
A.
42°N
4°W
Méridien origine
4°E
42°N
9°E
France
Autres pays
Principaux cours d'eau
Cours d'eau secondaires
Abréviations :
A. : Andorre
LU. : Luxembourg
M. : Monaco

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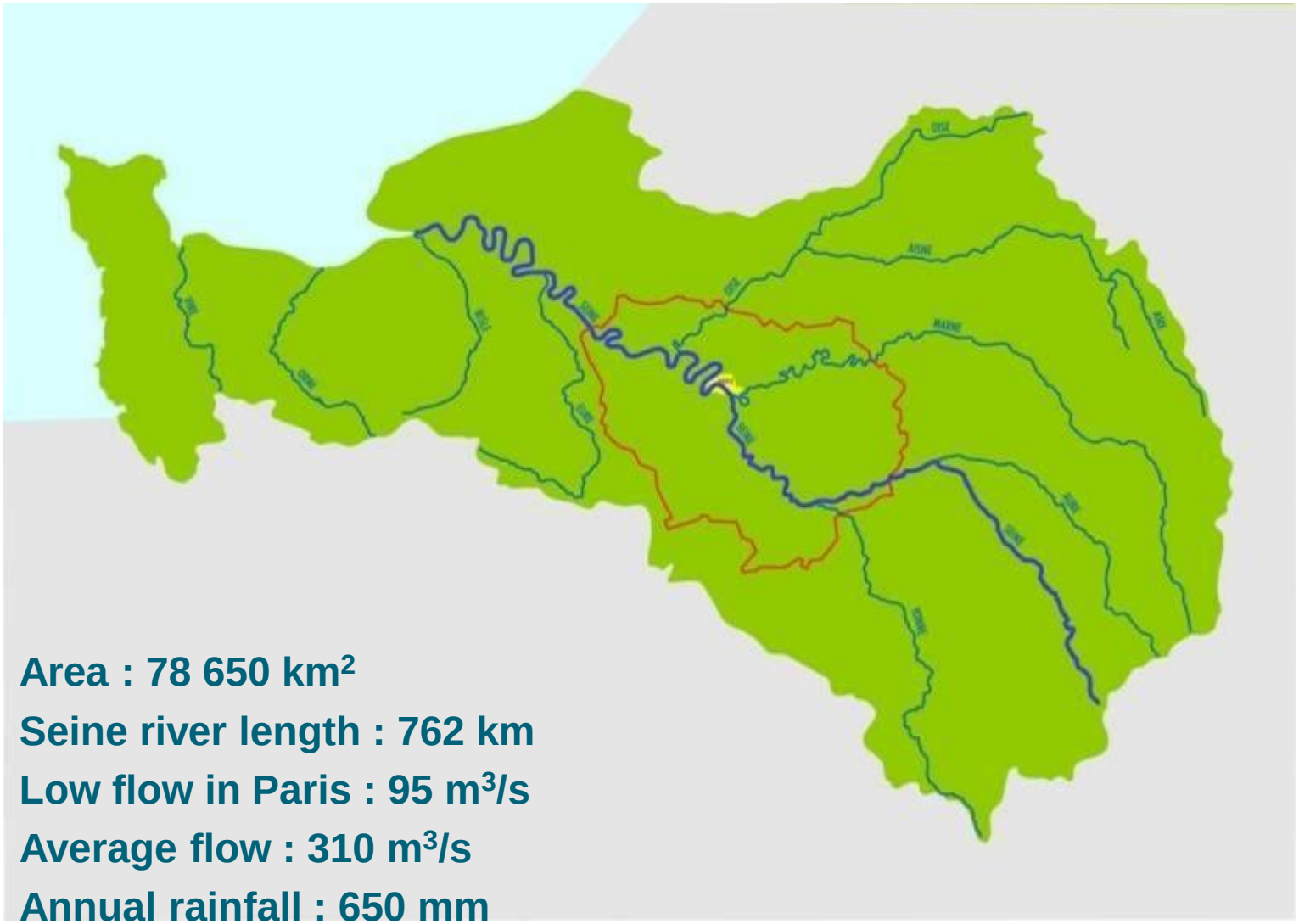
Seine River Catchment



Area : 78 650 km²

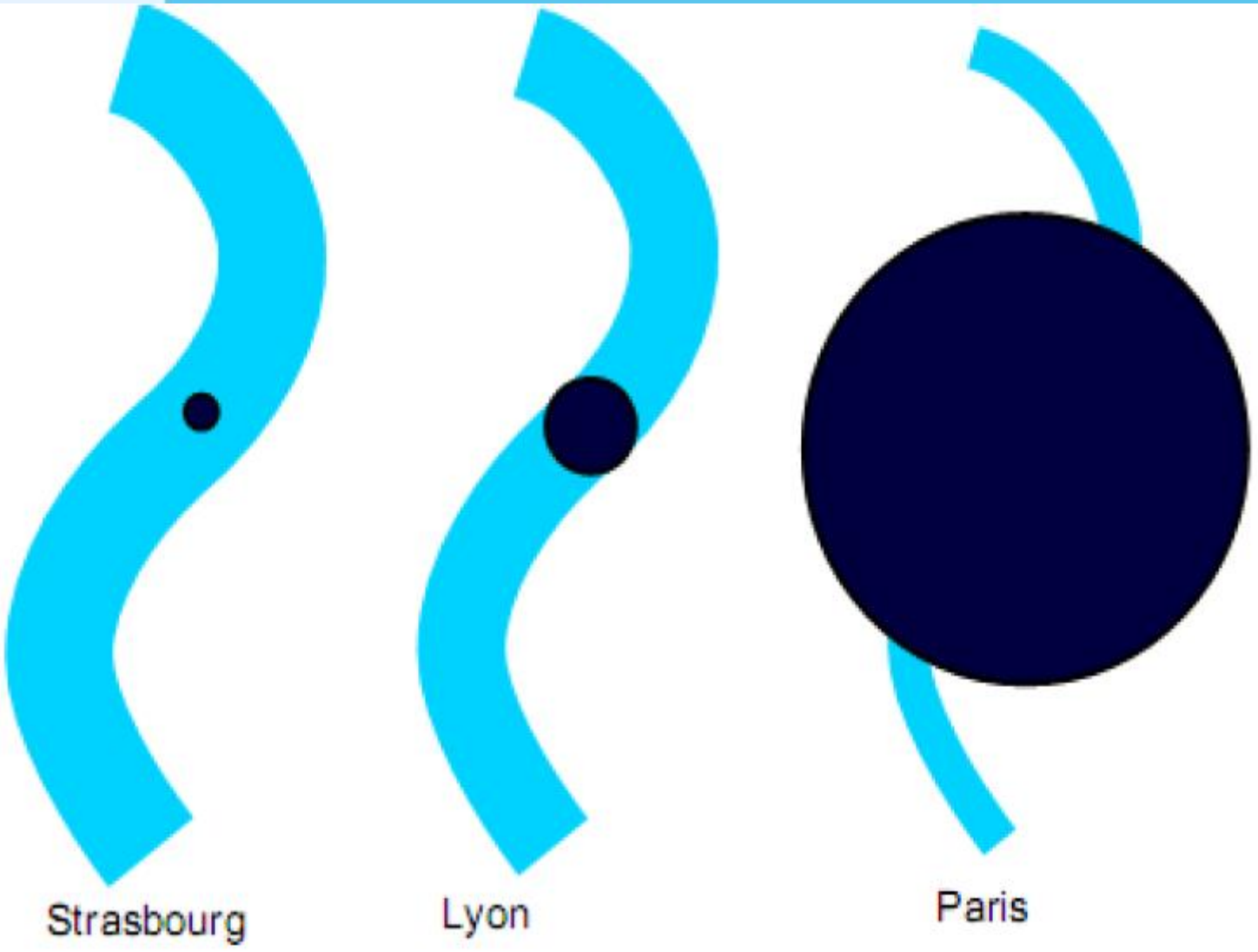
Seine river length : 762 km

Low flow in Paris : 95 m³/s

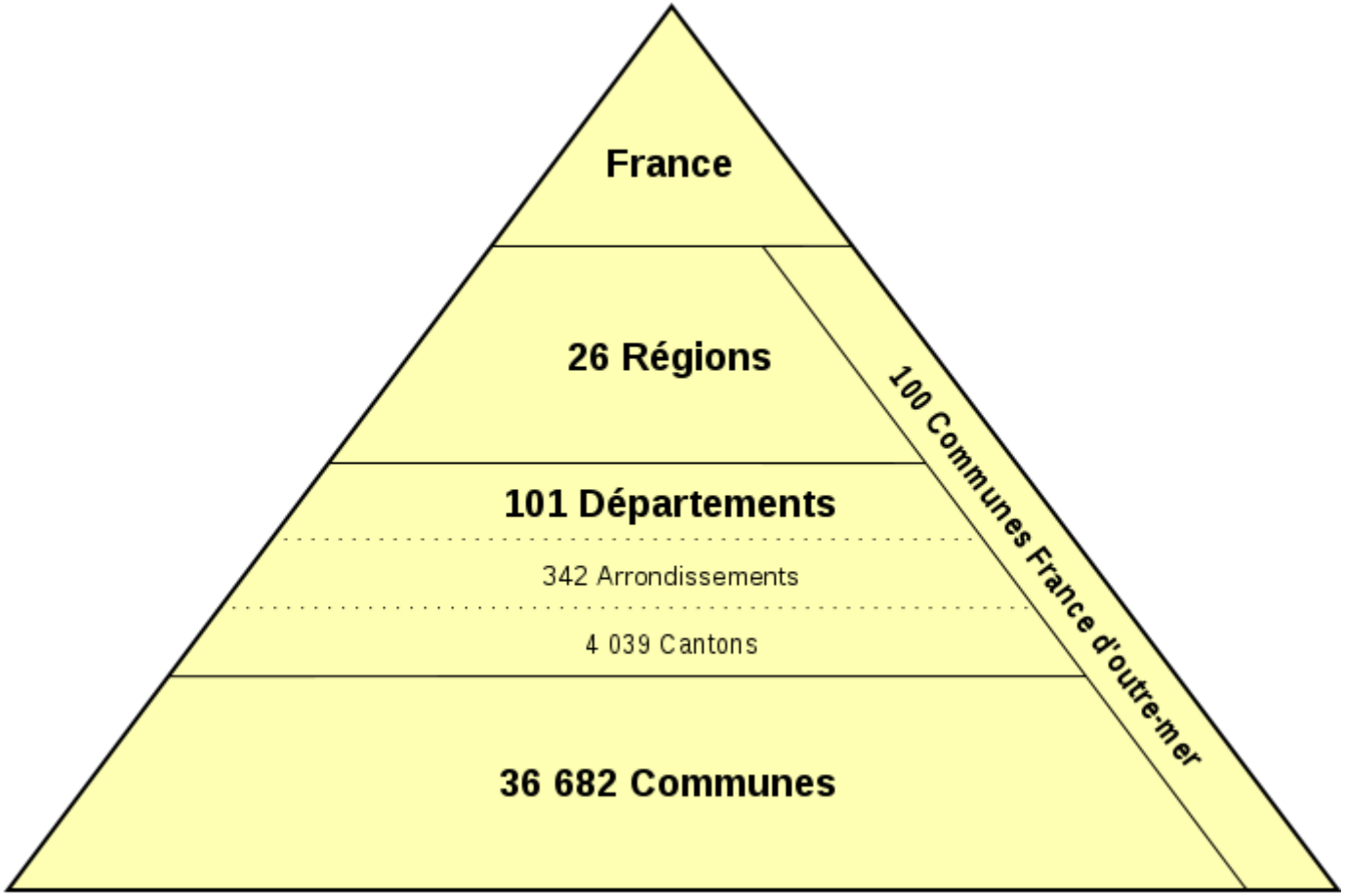
Average flow : 310 m³/s

Annual rainfall : 650 mm

A high anthropogenic pressure



Source : DRIEE


France
26 Régions
101 Départements
342 Arrondissements
4 039 Cantons
36 682 Communes
100 Communes France d'outre-mer

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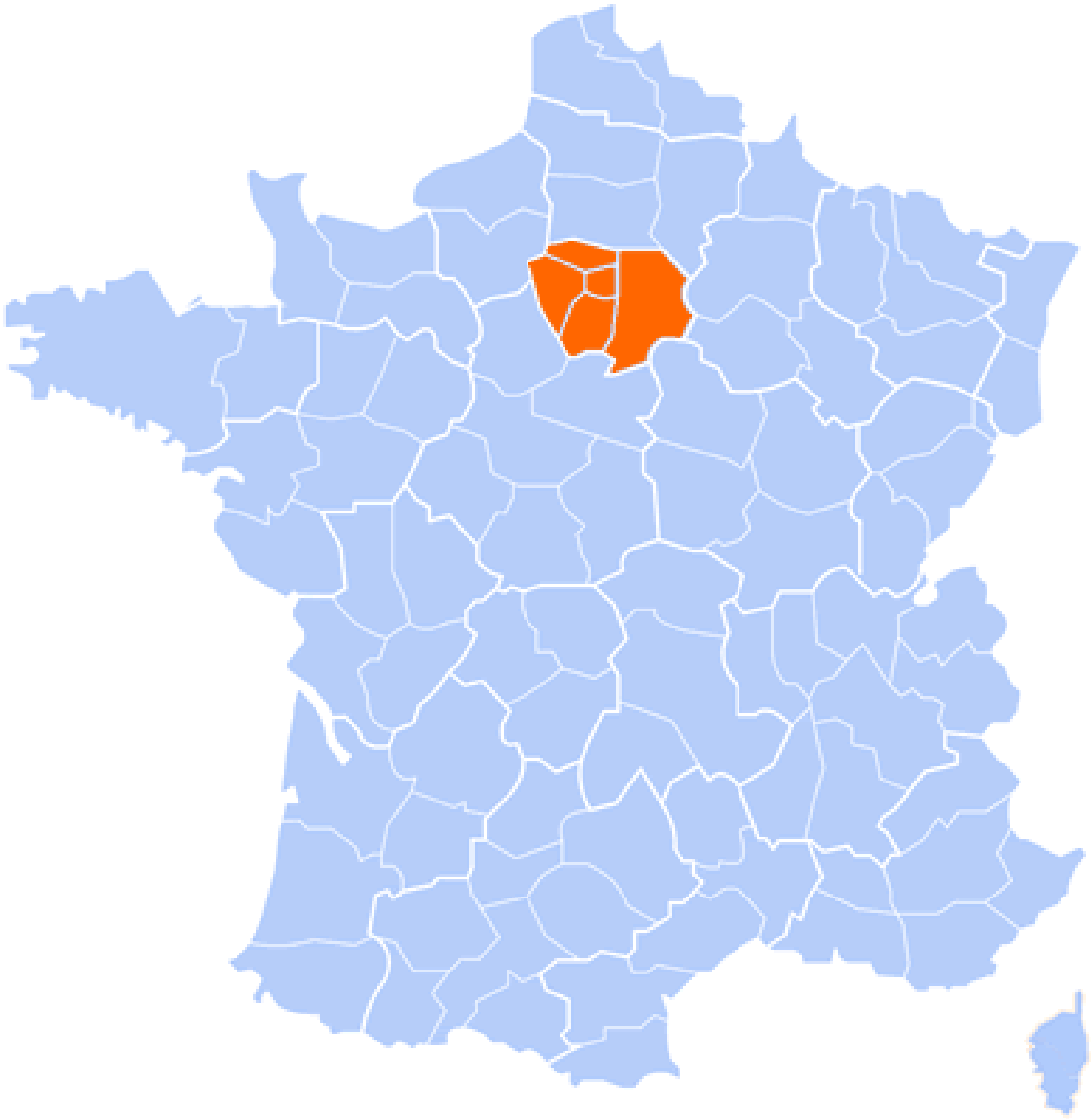
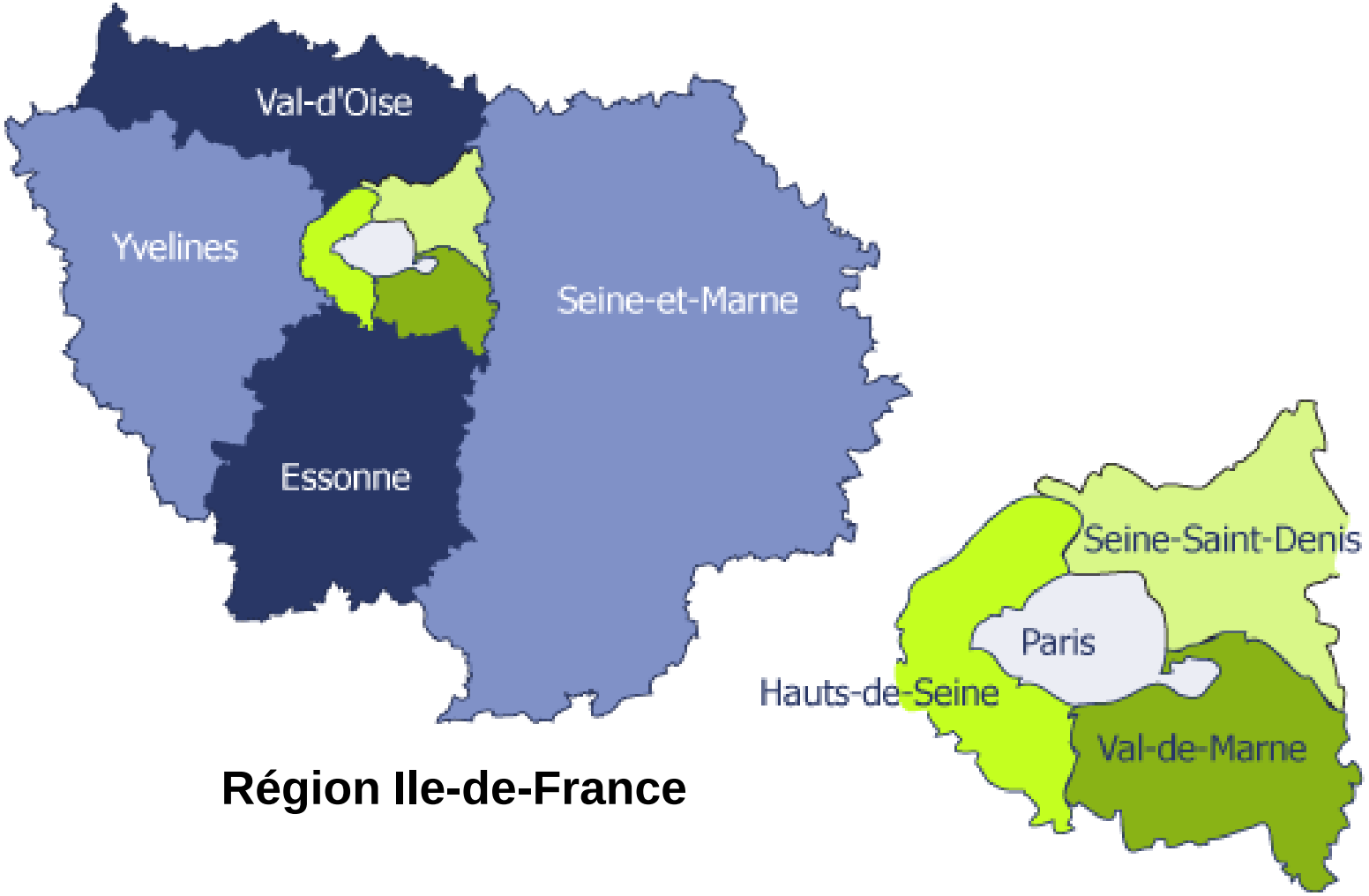
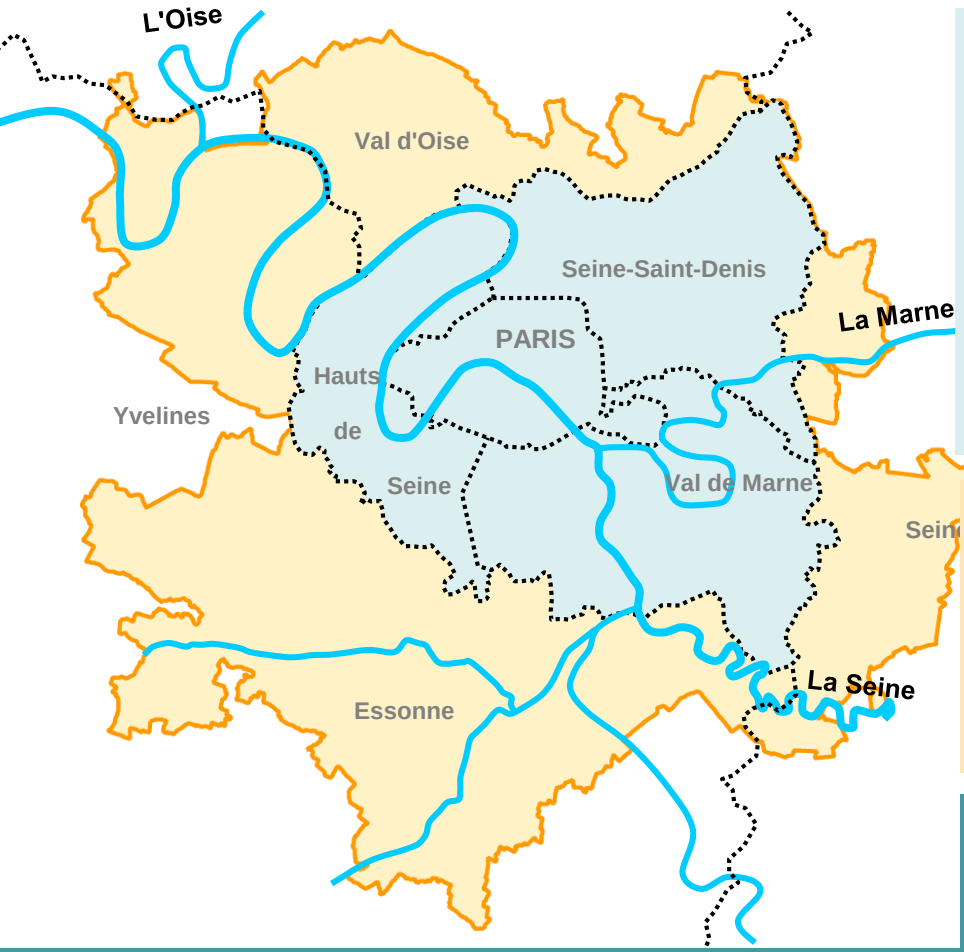




Région Ile-de-France

SIAAP presentation



The formally SIAAP

- 4 departments (administrative divisions of France)

The SIAAP Board (33 elected members)

- 124 municipalities
- 6.6 M inhabitants

Extended SIAAP limits

- 162 municipalities
- 2.3 M inhabitants

- 1980 km²
- 2 400 000 m³/d
- Mainly a combined sewer system
- Outer suburb : separate system

SIAAP :

- 286 municipalities
- 8,9 M connected inhabitants
- 400 industrial companies
- 15 000 km of municipal sewers

Financial Data

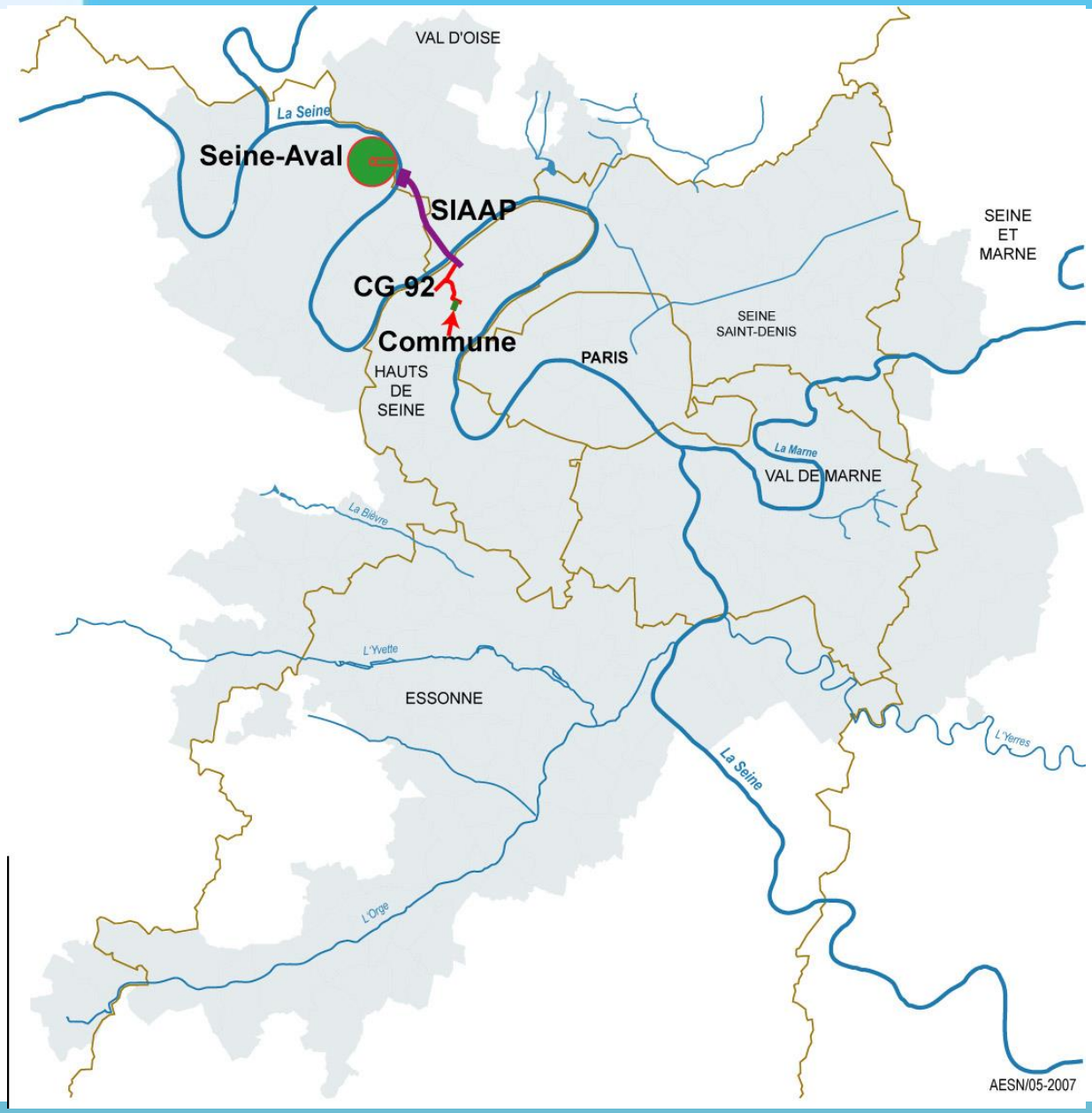
- **Global Budget (2014) : 1,25 billion €**
- **Operating expenses :**
  - **Opération (maintenance, energy, chemicals, etc.)**
  - **Wages (1770 employees)**
  - **Financial amortization**

- **Average Water Price : 3,56 €/m^3**
  - **1,41 €/m^3 for water supply**
  - **2,15 €/m^3 for sanitation with 0,764 €/m^3 for SIAAP**

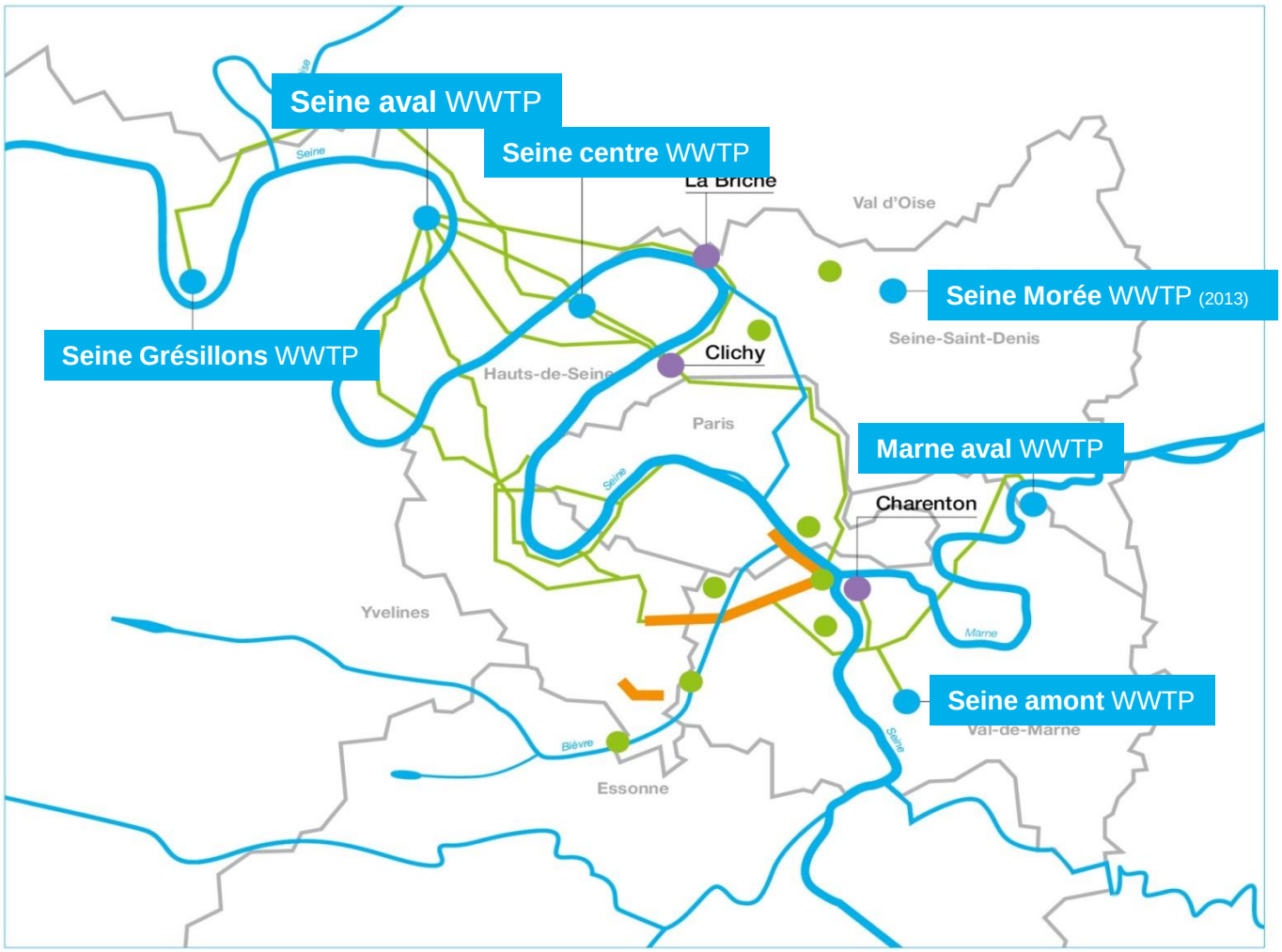
The Actors

- **Inhabitants, craftworks, industry :** **Pollutants producers**
- **Municipalities and/or Association of communes :** **Collection of waste water, police, town planning, building permits**
- **Association of communes, départements, SIAAP :** **Waste water tranportation**
- **SIAAP : waste water treatment**
- **State Authorities : regulation authority**
- **Water agency : financing projects, water management policy**

The route to the WWTP

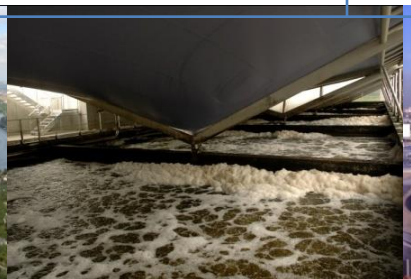


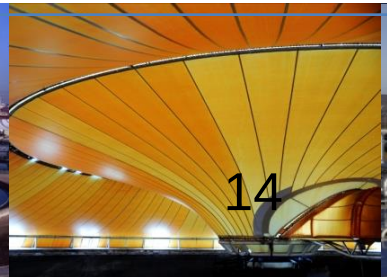
SIAAP's settlements



Main features of SIAAP'S WWTP

	Capacity for WFD (in PE)	Flow Dry weather/ Rain weather (en m^3/d)	Main features
Seine Aval	4 564 000 PE	1 500 000 / 2 900 000	Medium load activated sludge for carbon removal Biological Aerated Filter for nitrogen treatment Phosphorus removal : physico-chemical treatment Membrane Biological Reactor for sludge treatment effluent. Sludge treatment : anaerobic digestion, sludge sanitation and dehydratation
Seine Amont	2 618 00 PE	600 000 / 1 500 000	Conventional activated sludge and extended aeration Biological phosphorus removal & physico-chemical treatment Sludge treatment : anaerobic digestion and dryers
Seine Grésillons	1 149 000 PE	300 000 / 315 000	Primary treatment high speed physic-chemical settling Secondary treatment : Biological Aerated Filters Physico-chemical phosphorus removal. Sludge treatment: anaerobic digestion, dehydratation and thermic dryers.

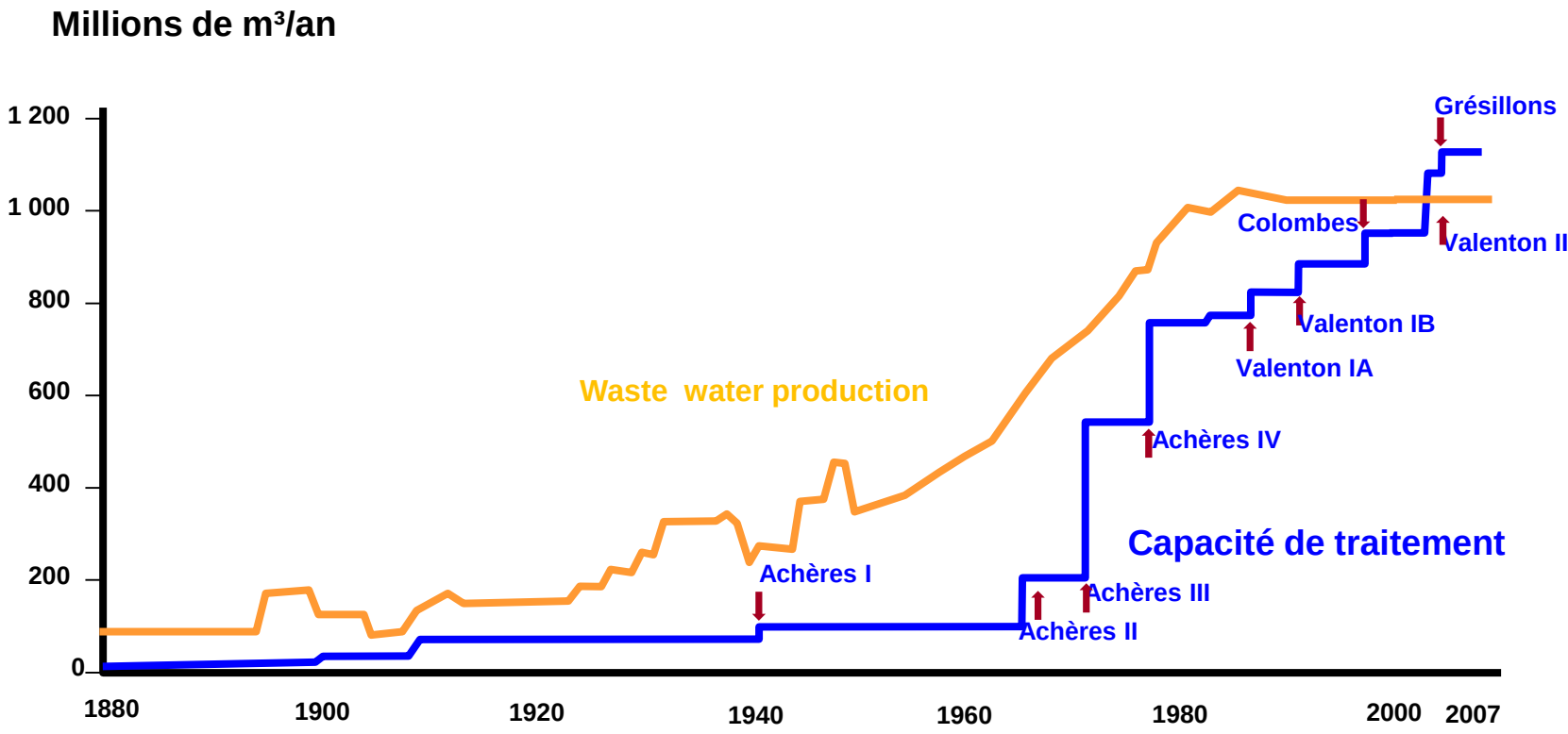



Main features of SIAAP'S WWTP

	Capacity or UWWD for WFD (in PE)	Flow Dry weather/ Rain weather (en m^3/d)	Main features
Seine Centre	982 000	240 000 / 404 800	Primary treatment high speed physico-chemical settling Biological aerated filters Physico-chemical phosphorus removal Sludge treatment : incineration
Marne Aval	500 000	75 000 / 125 000	Primary treatment high speed physico-chemical settling Biological aerated filters Physico-chemical phosphorus removal. Sludge treatment : incineration
Seine Morée	300 000	48 000 75 000	Primary treatment lamellar settling Secondary treatment : Membrane Biological Reactor Combined anaerobic digestion with organic domestic waste.



WWTP capacities evolution



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Main Sewers

- Length : 430 km
- Diameter : 2,5 to 6 meters
- Depth : 10 to 100 meters

Real Time Control : MAGES

- **Developped by the SIAAP and its partners**
- **Aims :**
  - Reduce stormwater spillages (not more than 2 spillages/year)
  - Optimize WWTP filling and emptying storage tanks
- **With :**
  - Rainfall forecasts
  - Numerical modelling

Storage facilities : 900 000 m3

- To prevent stormwater spillages
- Against floods and for stormwater pollution control

Seine river

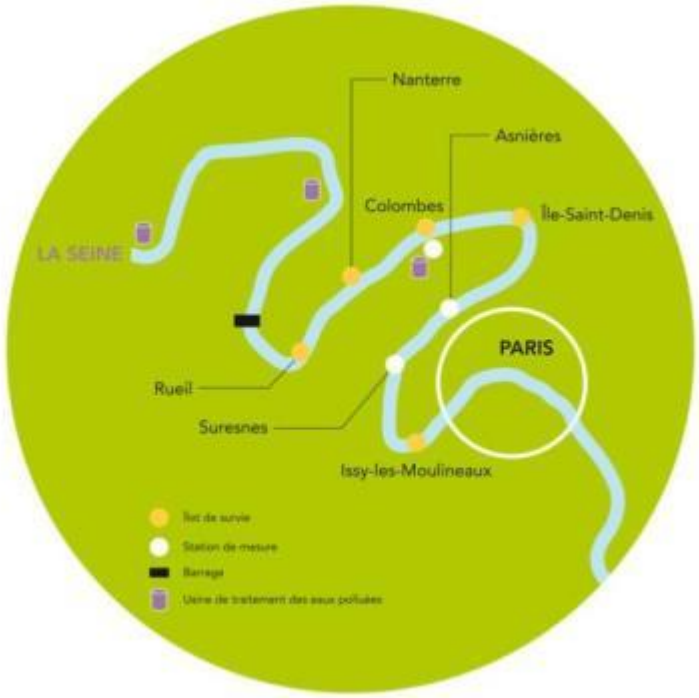
- **2 specific kinds of settlements :**

26 barriers for Wastes collection

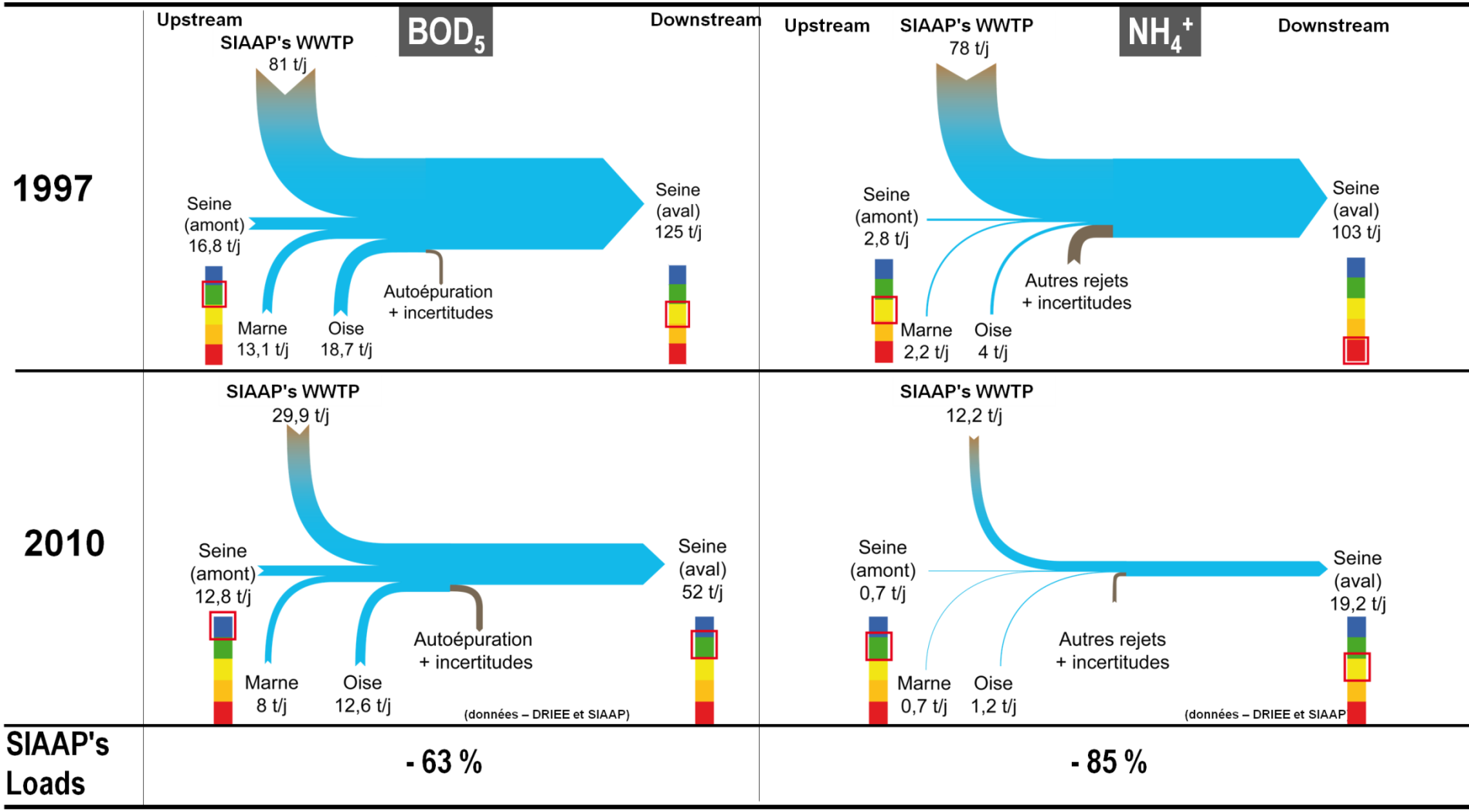
Videos-barrages flottants

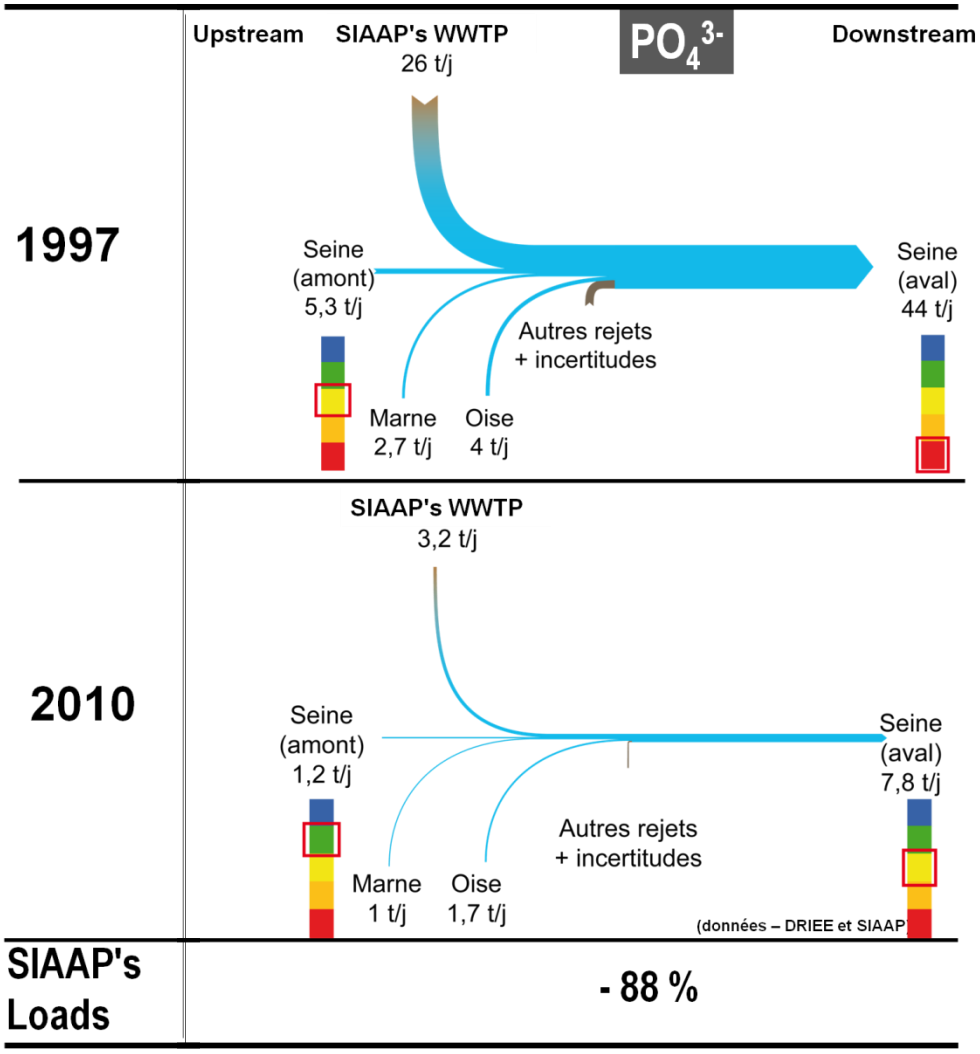
Videos - OxygenBubblers

5 oxygen Bublers:



Impact on receiving waters




Upstream
SIAAP's WWTP
26 t/j
PO_4^{3-}
Downstream
1997
Seine
(amont)
5,3 t/j
Autres rejets
+ incertitudes
Seine
(aval)
44 t/j
Marne
2,7 t/j
Oise
4 t/j
SIAAP's WWTP
3,2 t/j
2010
Seine
(amont)
1,2 t/j
Seine
(aval)
7,8 t/j
Autres rejets
+ incertitudes
Marne
1 t/j
Oise
1,7 t/j
(données – DRIEE et SIAAP
SIAAP's
Loads
- 88 %

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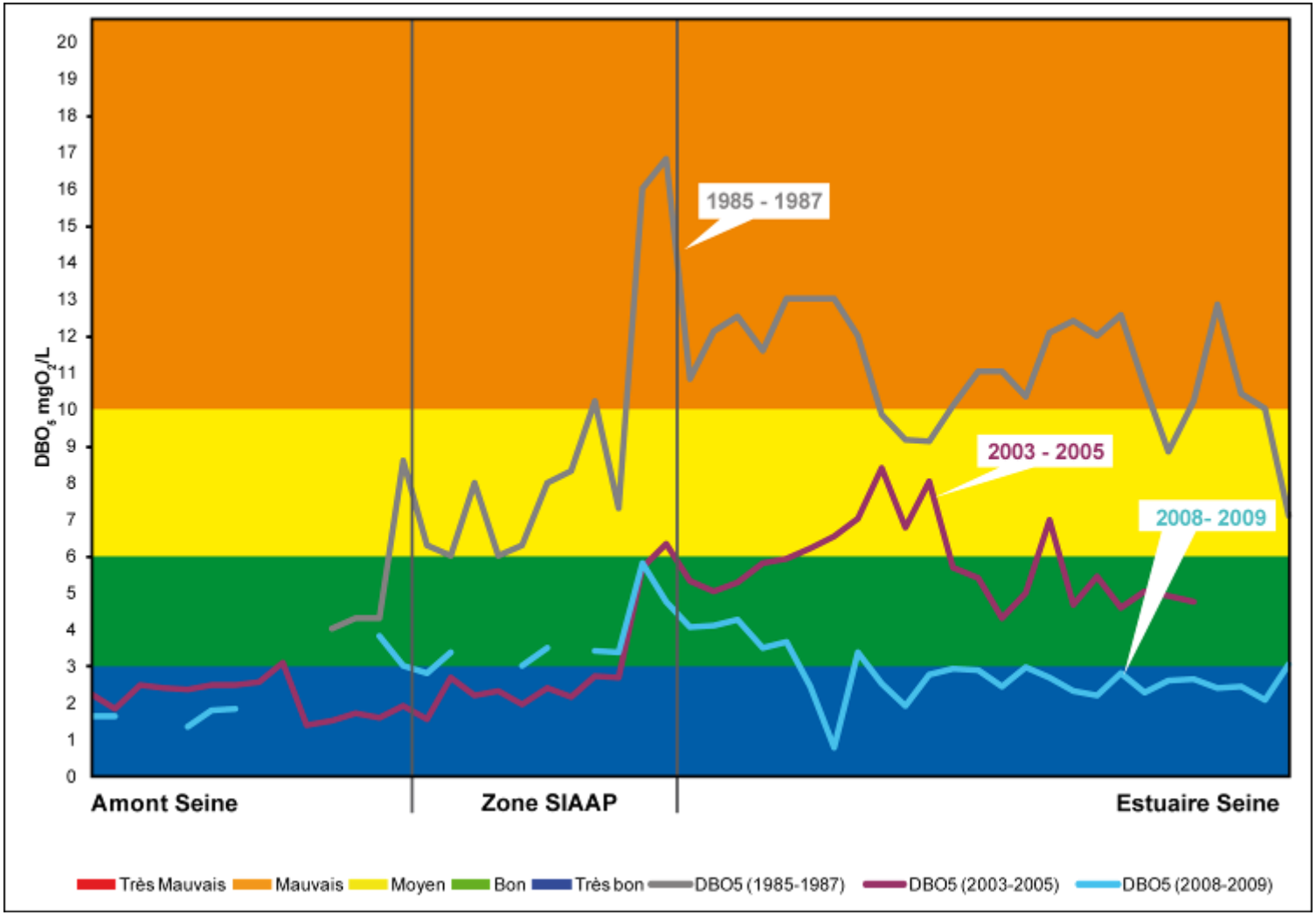
BOD 5



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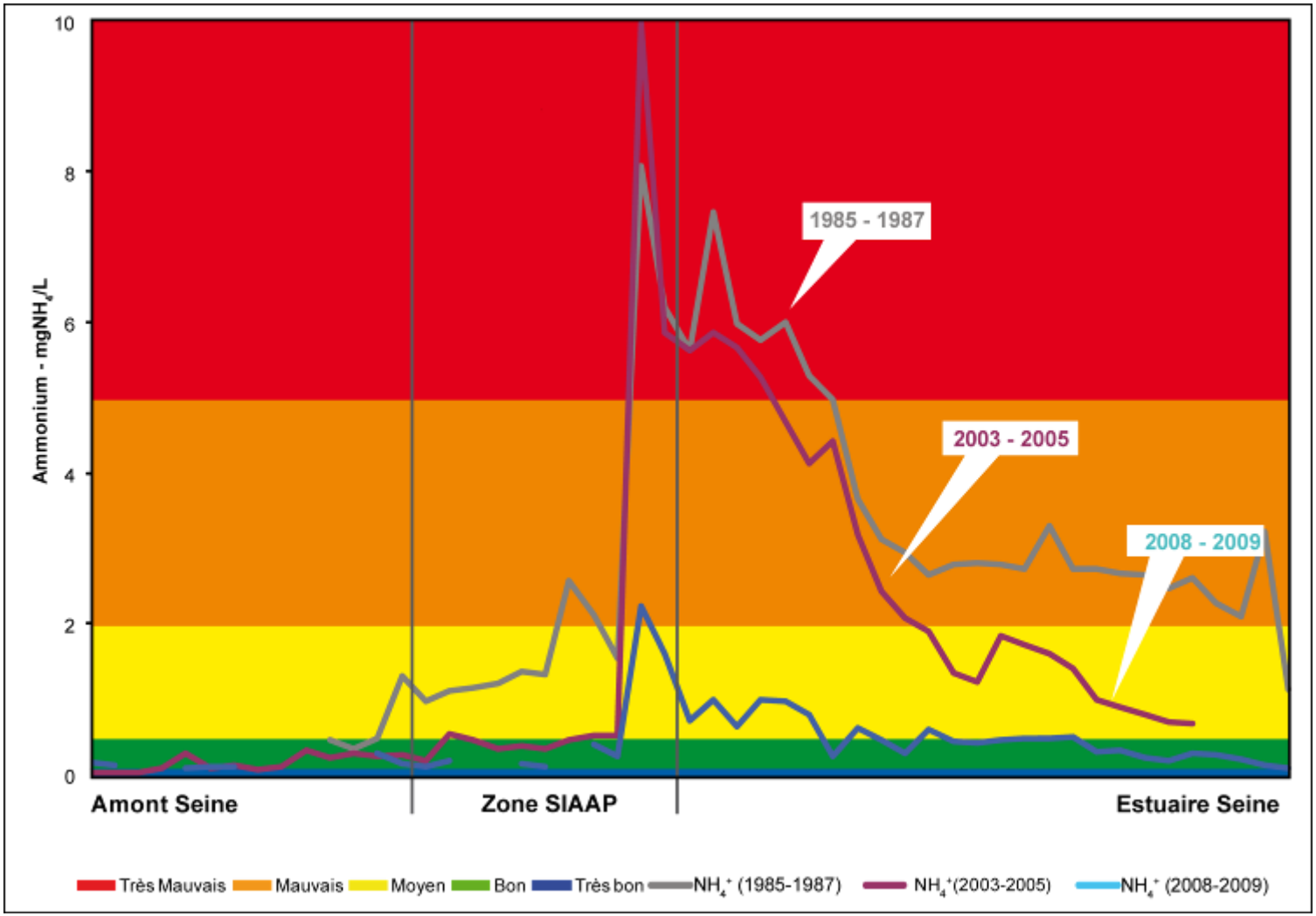
Ammonia



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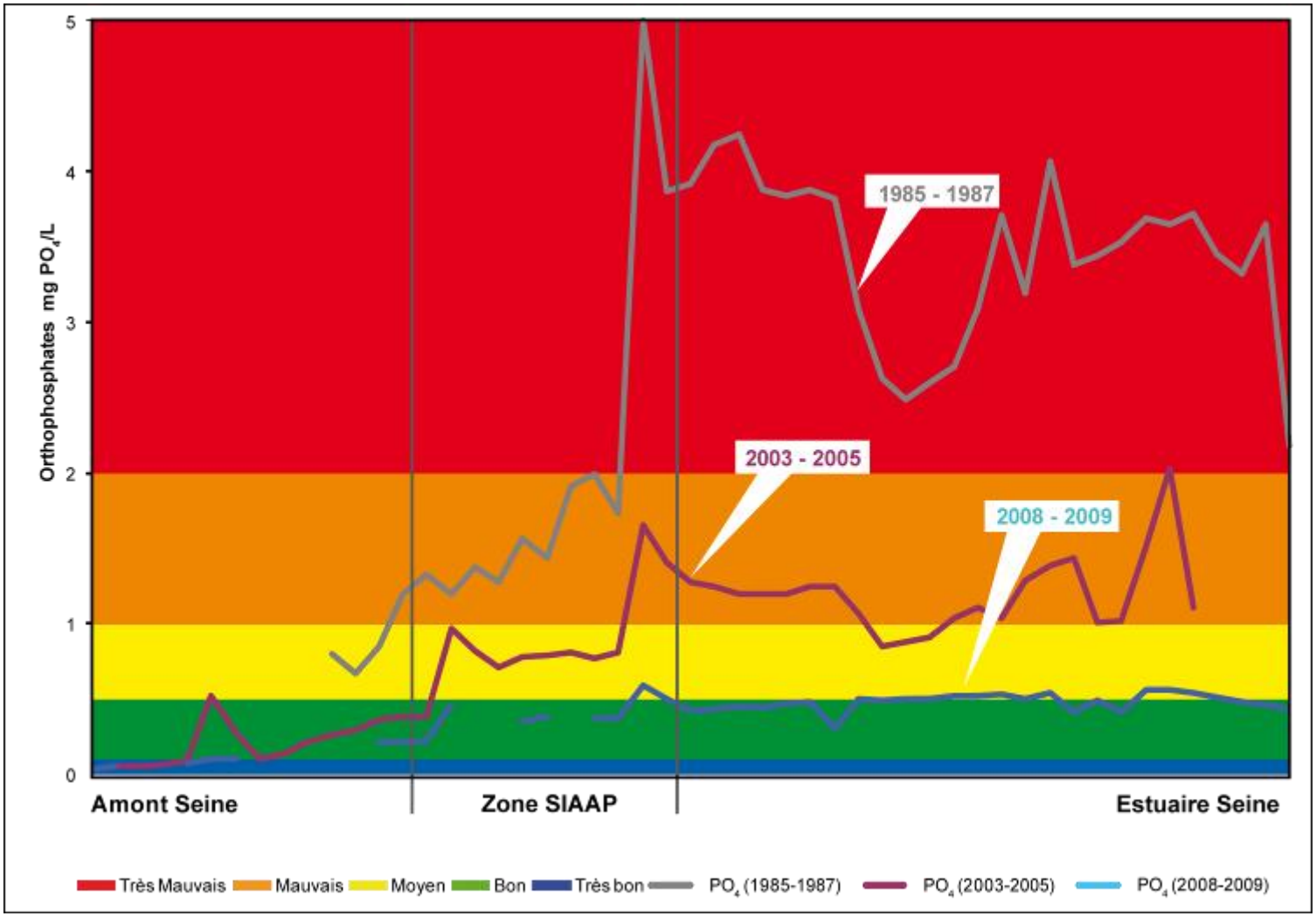
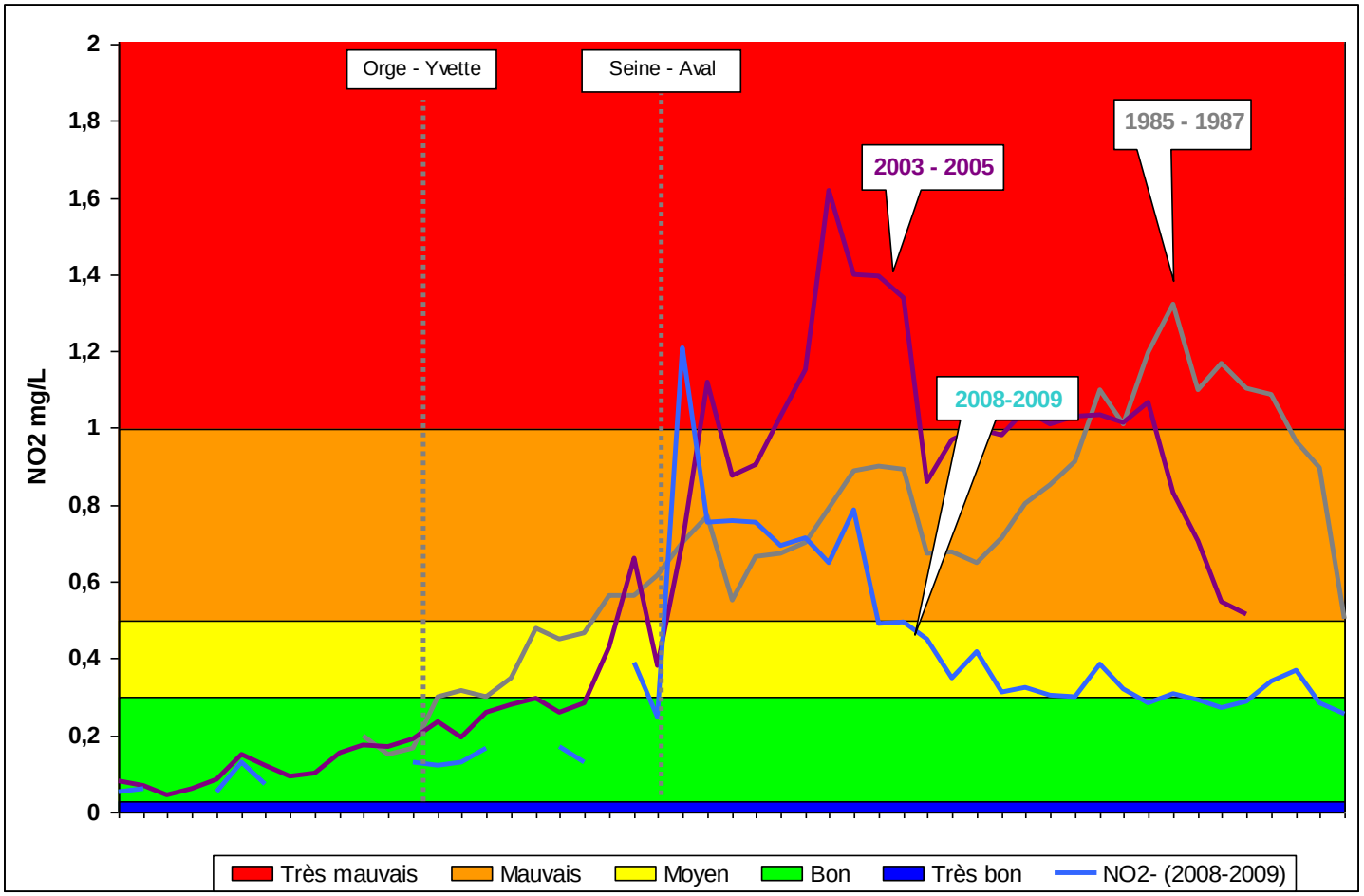
Phosphorus



Nitrite


Orge - Yvette
Seine - Aval
1985 - 1987
2003 - 2005
2008-2009
NO2 mg/L
2
1,8
1,6
1,4
1,2
1
0,8
0,6
0,4
0,2
0
Très mauvais
Mauvais
Moyen
Bon
Très bon
NO2- (2008-2009)

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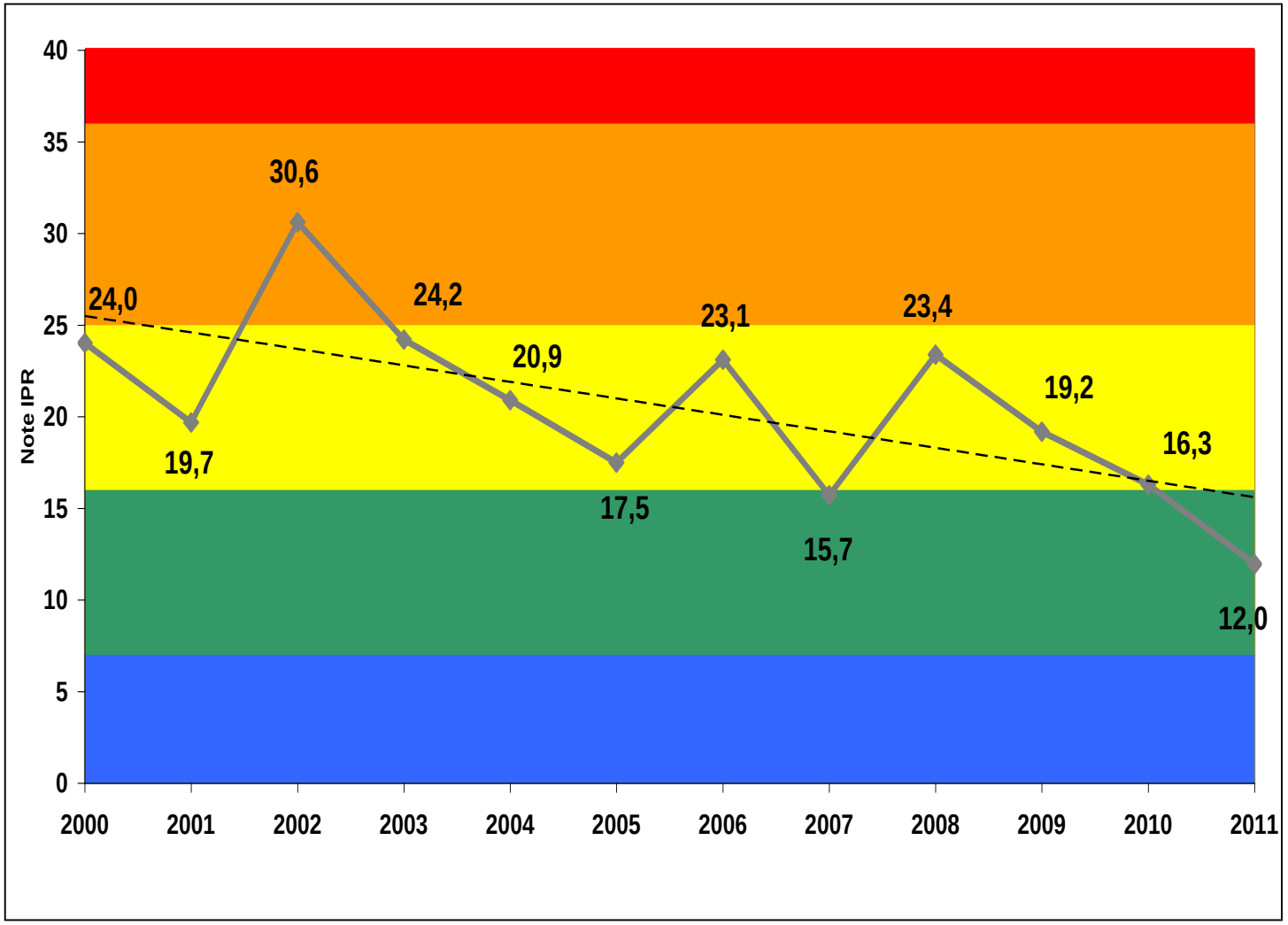
Fish index



Exceptionnal catches

Salmon 07/09/2008 at Maisons-Laffitte (78)

Salmon October 2008 at Suresnes (92)

Sea trout 26/07/2008 at Suresnes (92)

Thank for your attention

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