



Water Management in drought periods

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FRANCE



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MINISTÈRE
DE L'ÉCOLOGIE
ET DU
DÉVELOPPEMENT DURABLE



- French hydrological resources
- Water withdrawals and consumptions
- French water policy and organization
- How we assess and measure droughts
- Withdrawals regulation during drought crisis



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A privileged country

4 main rivers

- Garonne,
- Loire,
- Rhône,
- Seine.

Presence of borderline rivers

- Rhin
- Meuse
- Escaut
- ...





- **Precipitations** : 450 km³/year
(billions m³)

- **Effective precipitations** :
191 km³ / year

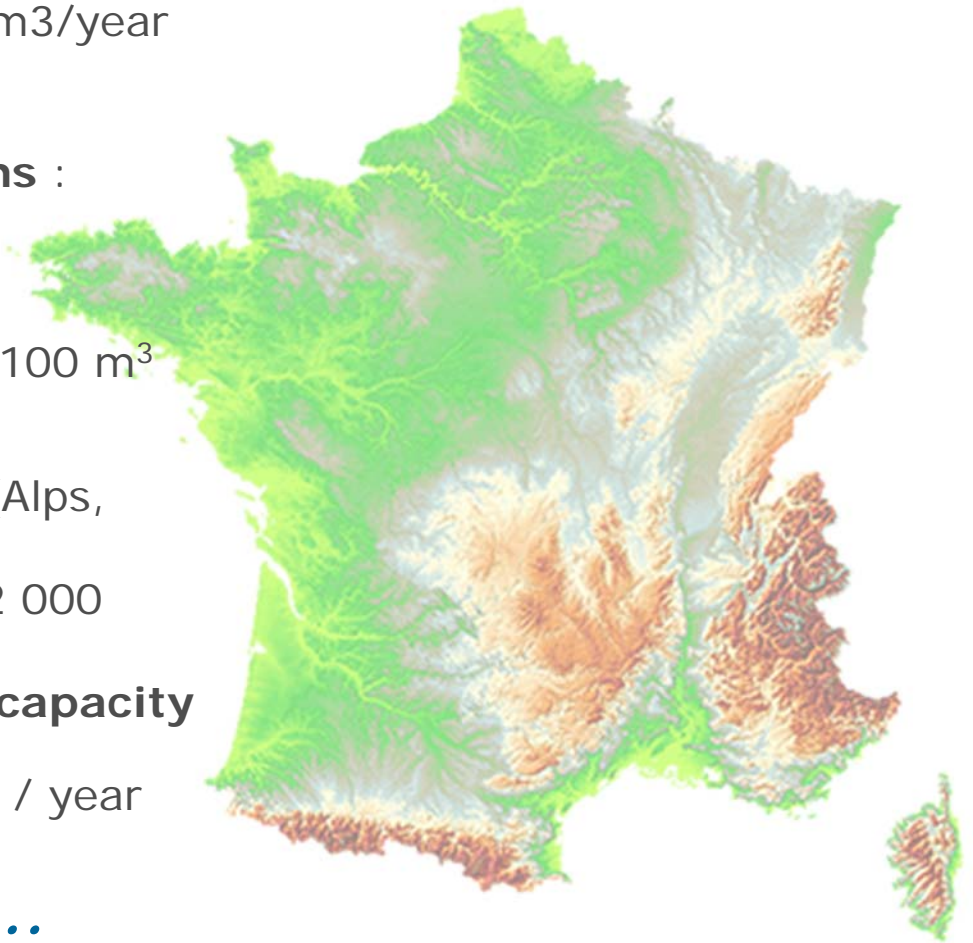
- **Potential resource**: 3 100 m³
per year per inhabitant

- Large mountain ranges (Alps,
Pyrenees) and presence
of sizeable groundwater 2 000
km³

⇒ **Large storage capacity**

- **Withdrawals** : 34 km³ / year

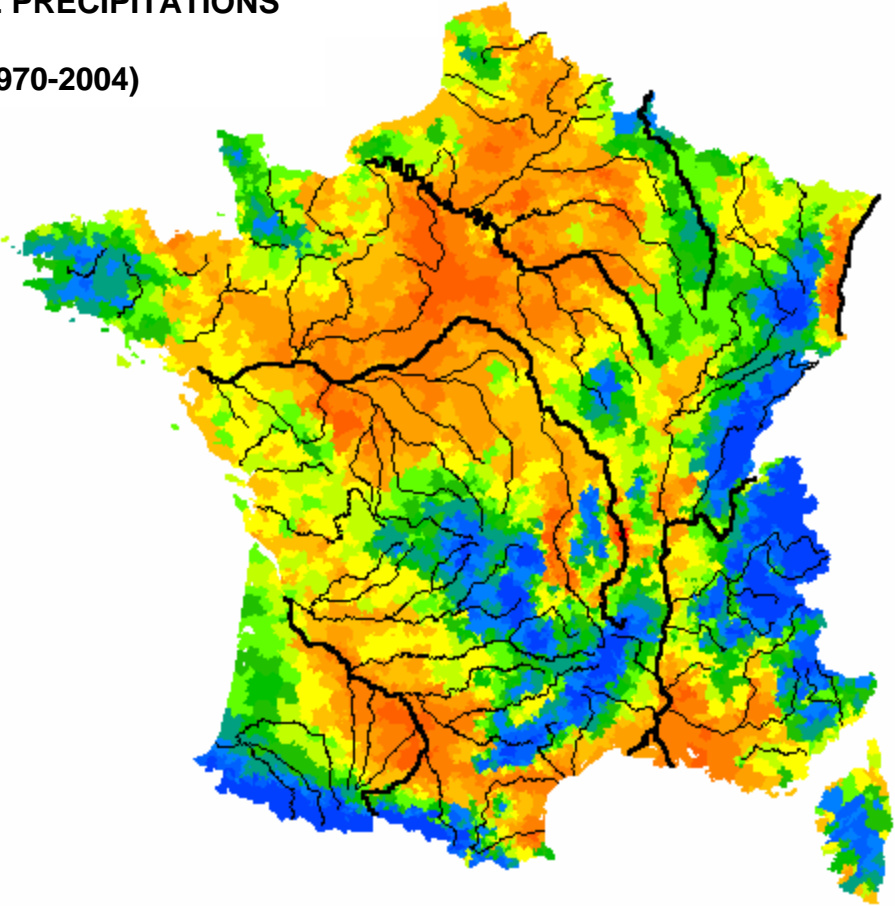
But...



Spatial variability

EFFECTIVE PRECIPITATIONS

(1970-2004)



lame d'eau
(en mm)

1 - 50
50 - 100
100 - 150
150 - 200
200 - 250
250 - 300
300 - 350
350 - 400
400 - 450
450 - 500
500 - 600
600 - 750
750 - 1000
1 000 - 1 500
1 500 - 2 000

CARTE ÉTABLIE A LA DIRECTION DE L'EAU, SD-EAP, BUREAU DE LA CONNAISSANCE DES MILIEUX AQUATIQUES par J.C.SCHÉRER, le 7.8.2002

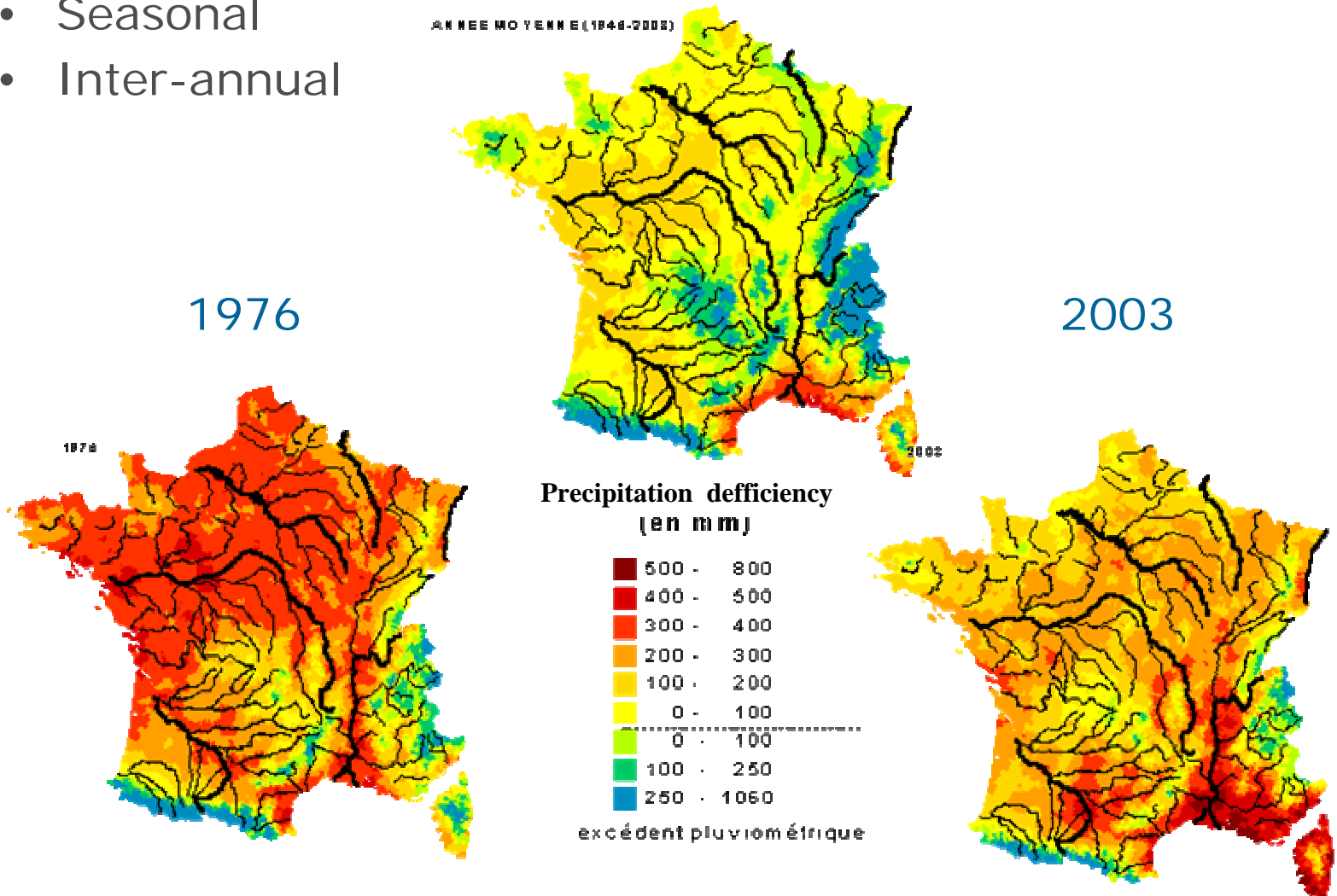



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Temporal variability

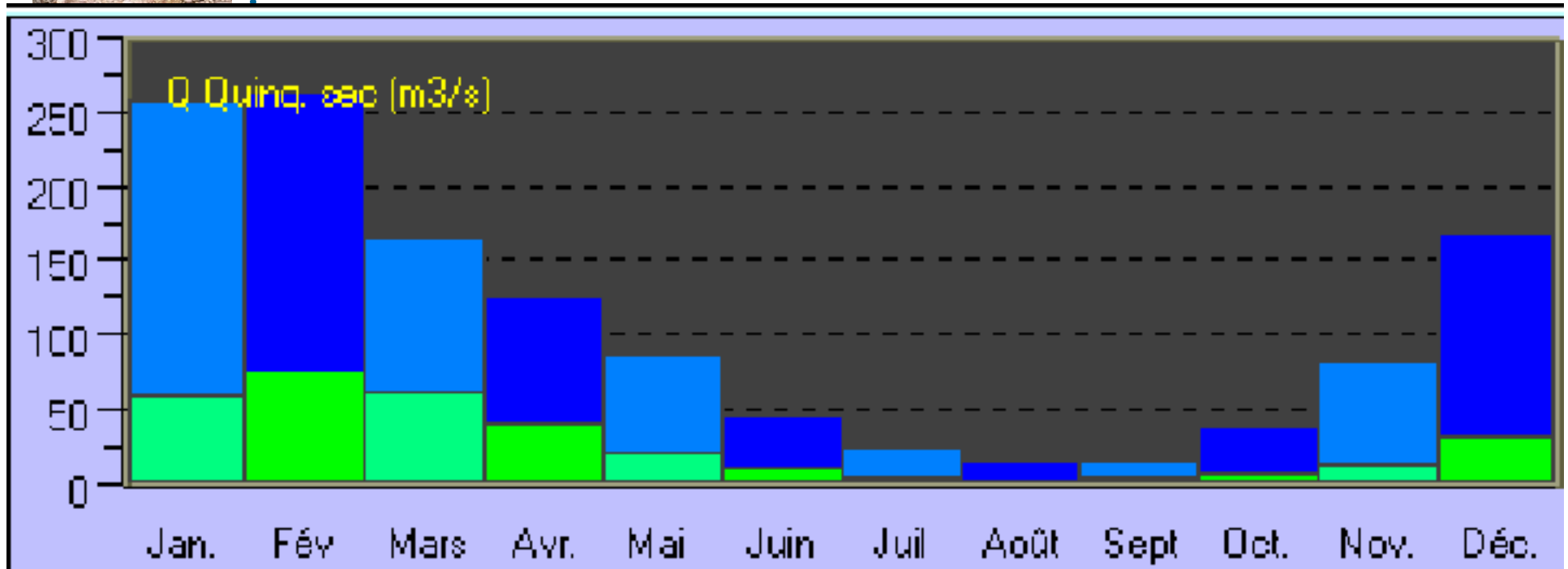
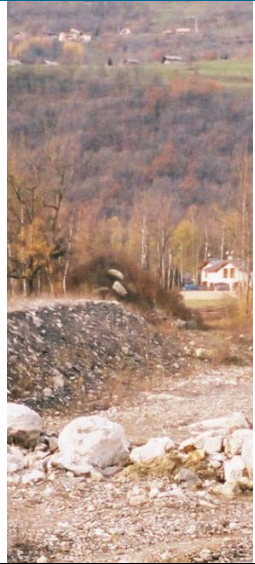
- Seasonal
- Inter-annual



Watercourses regime

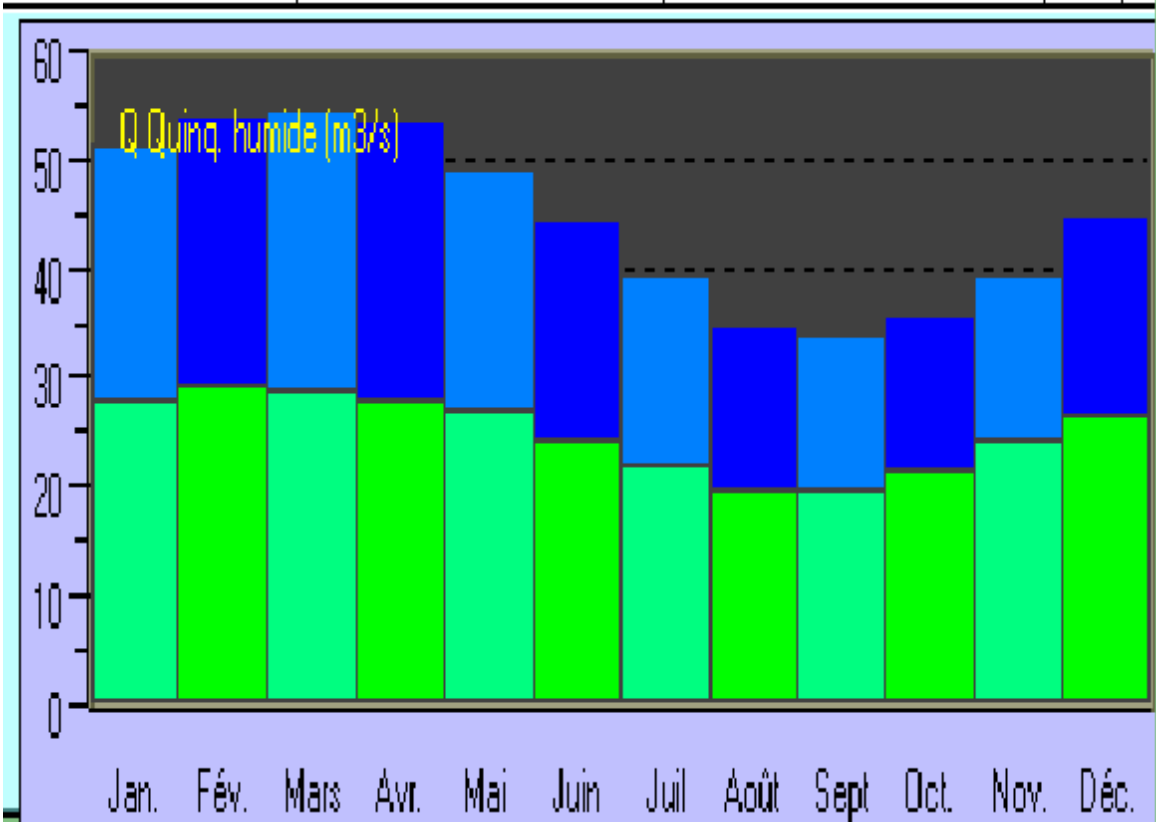
Less watercourses sustained: increase minimum low water and bigger variability between dry and humid years

Vilaine River



Watercourses regime

Watercourse with important groundwater relation



Somme River



Groundwater behaviour

ADES bank
(since may 2003)

STATION DE MESURE DE L'ETAT QUANTITATIF DES EAUX SOUTERRAINES

Code de la station : 10345X0199/F

Consulter les 1432 mesures Dessiner la courbe Historique modes de mesure

Historique modes de dépouillement Retourner à la carte

LOCALISATION

Département : HAUTE-GARONNE (31)
 Commune : SAINT-ELIX-LE-CHATEAU
 Lieu-dit : PLACE DE L'ECOLE

XL
YL
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SYSTEMES AQUIFERES OBSERVES
Indéterminé

Graphe chronique Graphe statistiques Table statistique

Date

Sans Zoom
Zoom -
Zoom +
Légende
Grille verticale
Grille horizontale
Profondeur
Interruption

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• Main human work to share water

- Canals
- Aqueducts
- Dams
- Groundwater recharge

...



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Water withdrawals

- Four main uses : industry (including energy), water supply, irrigation and environment
- Withdrawals and consumptions, periods
- Irrigation keys



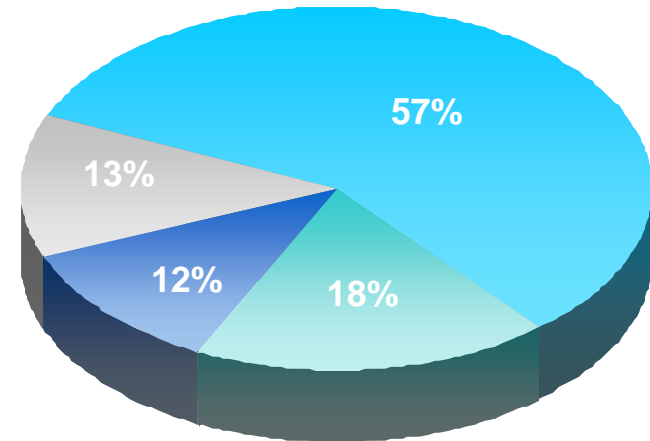
Overabstraction areas





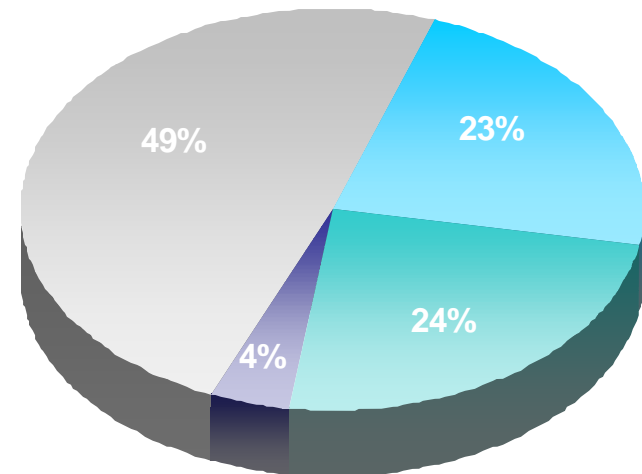
Withdrawals

- Distributions publiques 18 %
- Industries (hors réseau public) 13 %
- Irrigation, Agriculture 12 %
- Centrales électriques, thermiques et nucléaires 57 %



Consumptions

- Distributions publiques 25 %
 - Industries (hors réseau public) 4 %
 - Irrigation, Agriculture 49 %
 - Centrales électriques, thermiques et nucléaires 22 %
- During 4 month from may to august

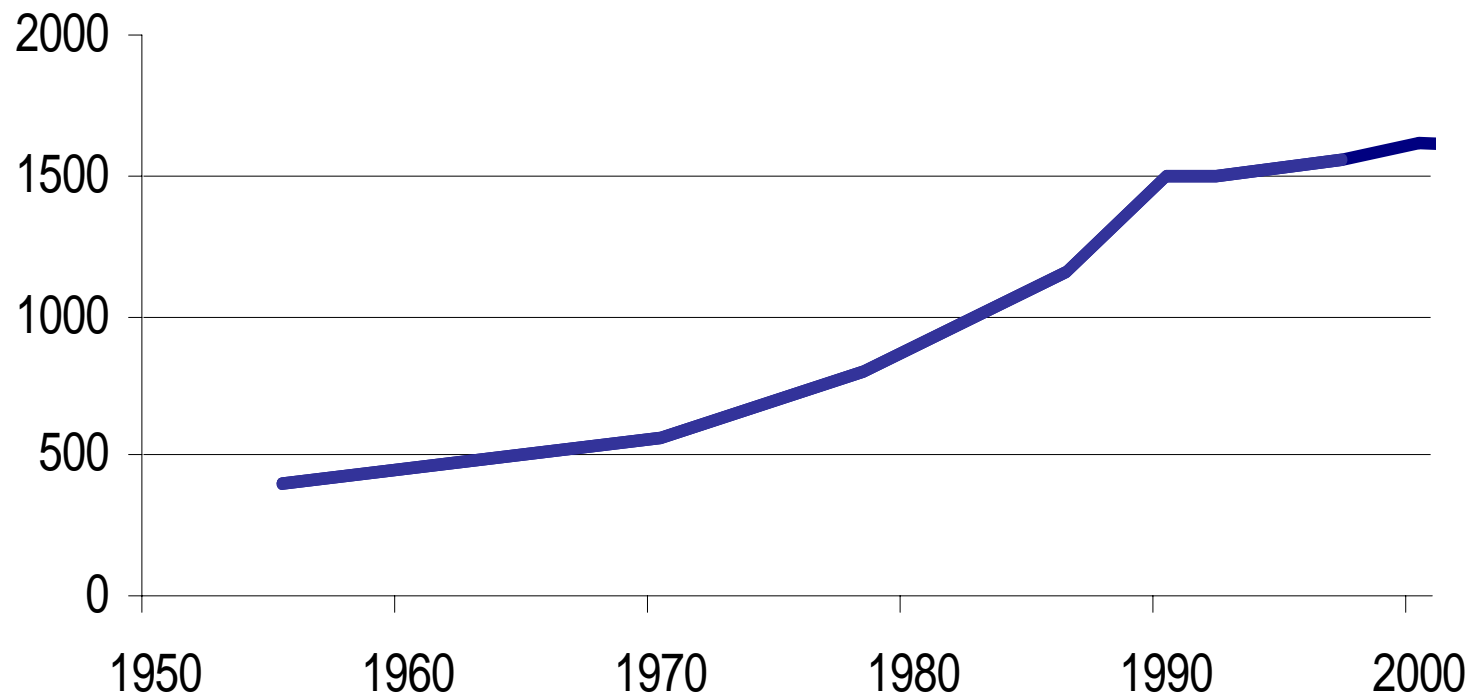


Irrigated surfaces are up 66 %
between 1988 to 1997

60 % of irrigated surfaces engaged with corn



Irrigated surfaces (thousands of ha)

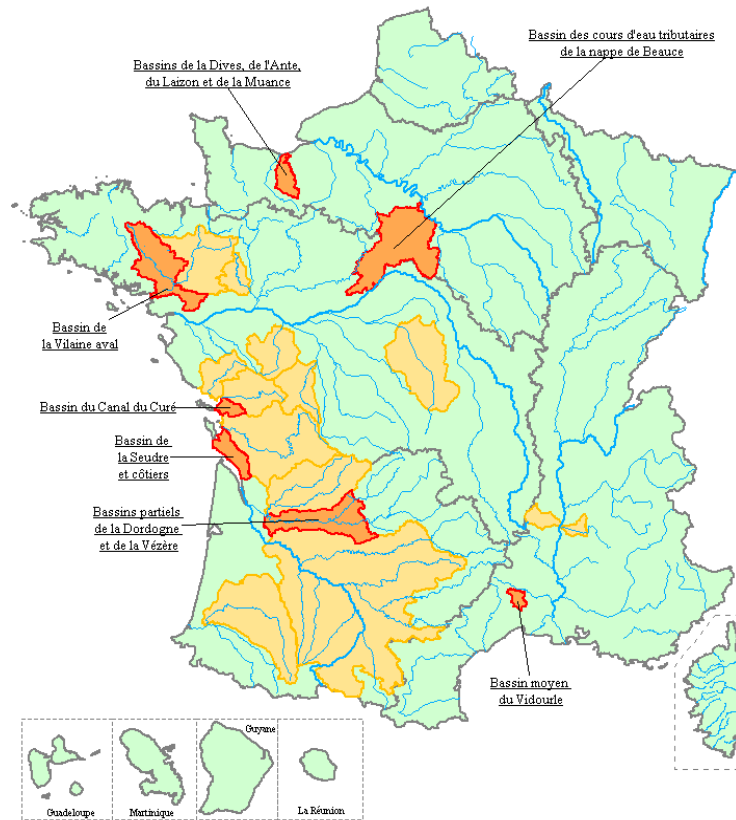


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Overabstraction areas which increase drought effects



Zones de Répartition des Eaux proposées
A Les bassins hydrographiques

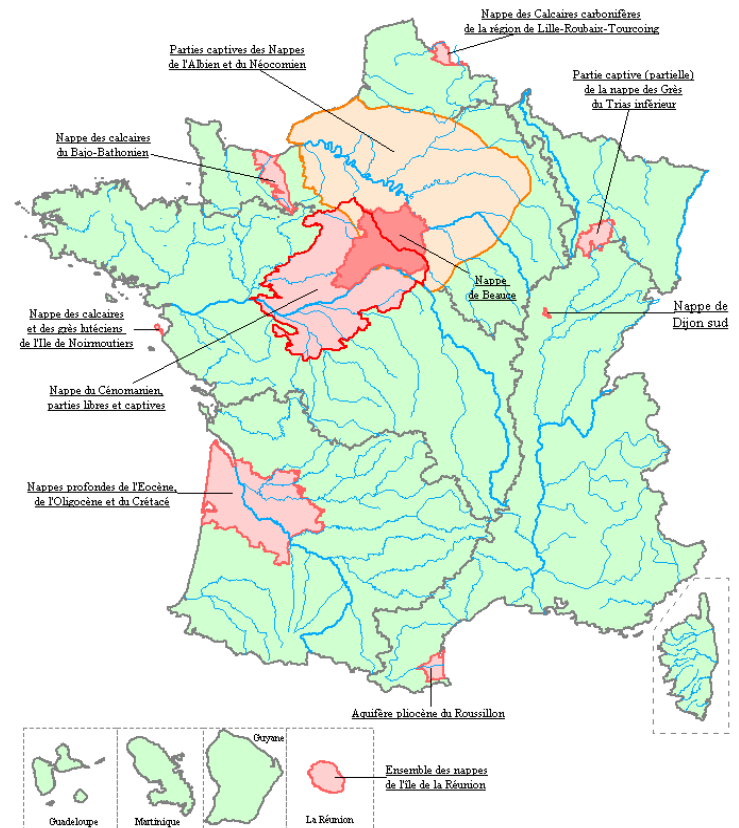


- Bassins hydrographiques proposés
- Zones de Répartition des Eaux existantes

Direction de l'Eau - Bureau de la Connaissance des Milieux Aquatiques - Mai 2001



Zones de Répartition des Eaux proposées
B Les systèmes aquifères



- Systèmes aquifères proposés

Direction de l'Eau - Bureau de la Connaissance des Milieux Aquatiques - Mai 2001





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Decentralised management and local decision-making

- 95 French department + 4 French Overseas Departments + 6 French Overseas Territories
- 26 regions
- 36 560 communes (plus 114 in the Overseas Departments and 80 in the Overseas Territories)



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Different levels and organization



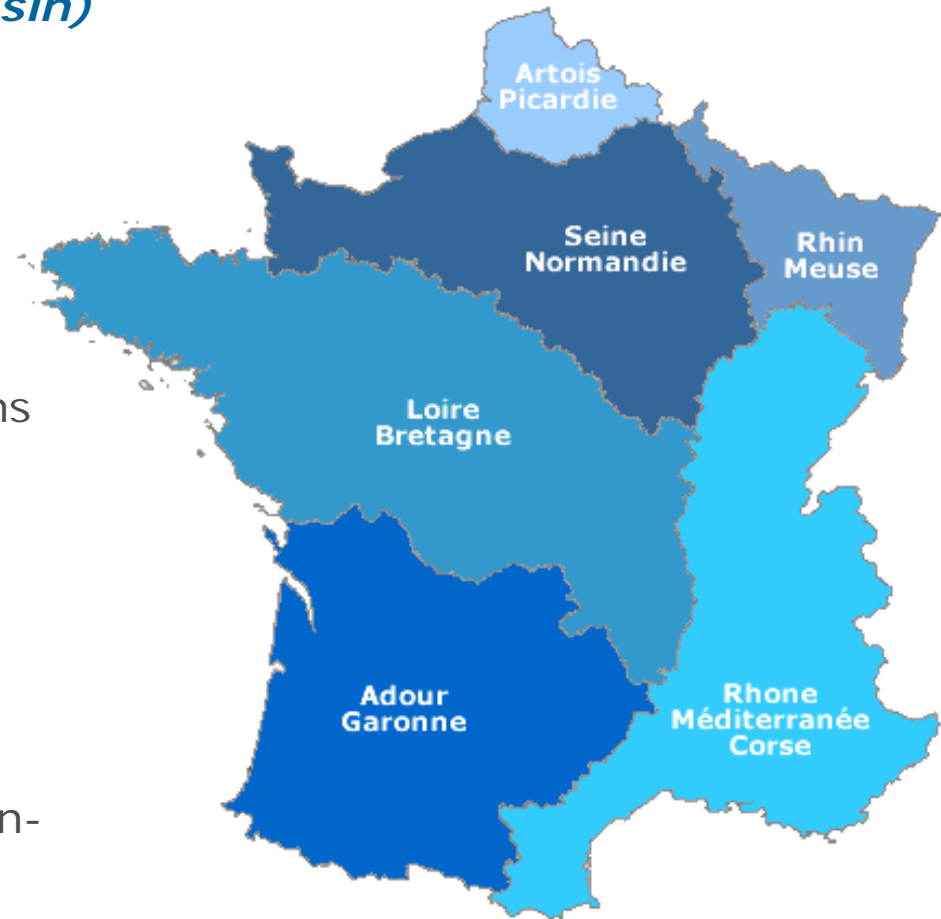
A territory adapted to water resource management : a drainage area (basin)

Drainage areas:

- natural geographical division,
- different from administrative divisions

6 drainage areas

- Adour - Garonne,
- Artois-Picardie,
- Loire-Brittany,
- Rhine-Meuse,
- Rhône-Méditerranéen-Corsica
- Seine-Normandy.



Different levels and organization

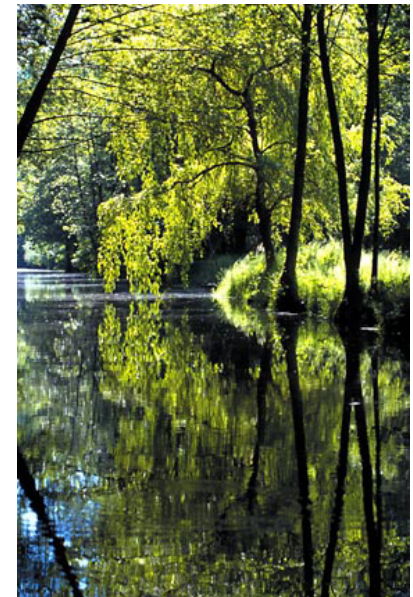




Law n°92-3 of January 3, 1992 concerning water

« **Water** is part of our **nation's common heritage**. It is in the **public interest** to protect, enhance and develop usable water resources while maintaining the natural environmental balance. The **use of water belongs to everyone within** the scope of existing laws and regulations as well as previously established rights ».

- preserve aquatic ecosystems and wetlands,
- protect and restore the quality of surface and underground water,
- **protect, enhance and develop water resources** in order to satisfy the requirements of public health, business and leisure activities.



Cemagref





Water management

- Set up an **authorisation declaration system** for installations, works, construction and activities with an impact on water resources
- Administrative **overabstracted areas**
- **Planning** : a tool enabling the main water users to consult with the state in setting objectives to improve water resources
 - SDAGE : Guideline for water management at the basin level
 - SAGE : Guideline for water management at the sub-basin level
- Participation of elected officials and users, informing public
- **Strengthen water police**
 - The water police includes several state departments, grouped together within the MISE (Interdepartmental water services mission),
 - Leading the water police and coordinating Interdepartmental Water Services Mission by the Regional Environment Department (DIREN) at the regional level
- **Increase sanctions** for water resource damage.
- During drought crisis, allow prefects to take restrictions or suspension measures for withdrawals



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A national drought action plan

10 actions to anticipate and improve drought management.

Among them :

- a. Monitore hydrological situation
- b. Anticipate for efficient measures
 - => strenghten of drought management plan in each basin
 - => consolidate upstream / downstream solidarity
- c. Improve crisis management
- d. Reduce overabstracted areas (water law reform)





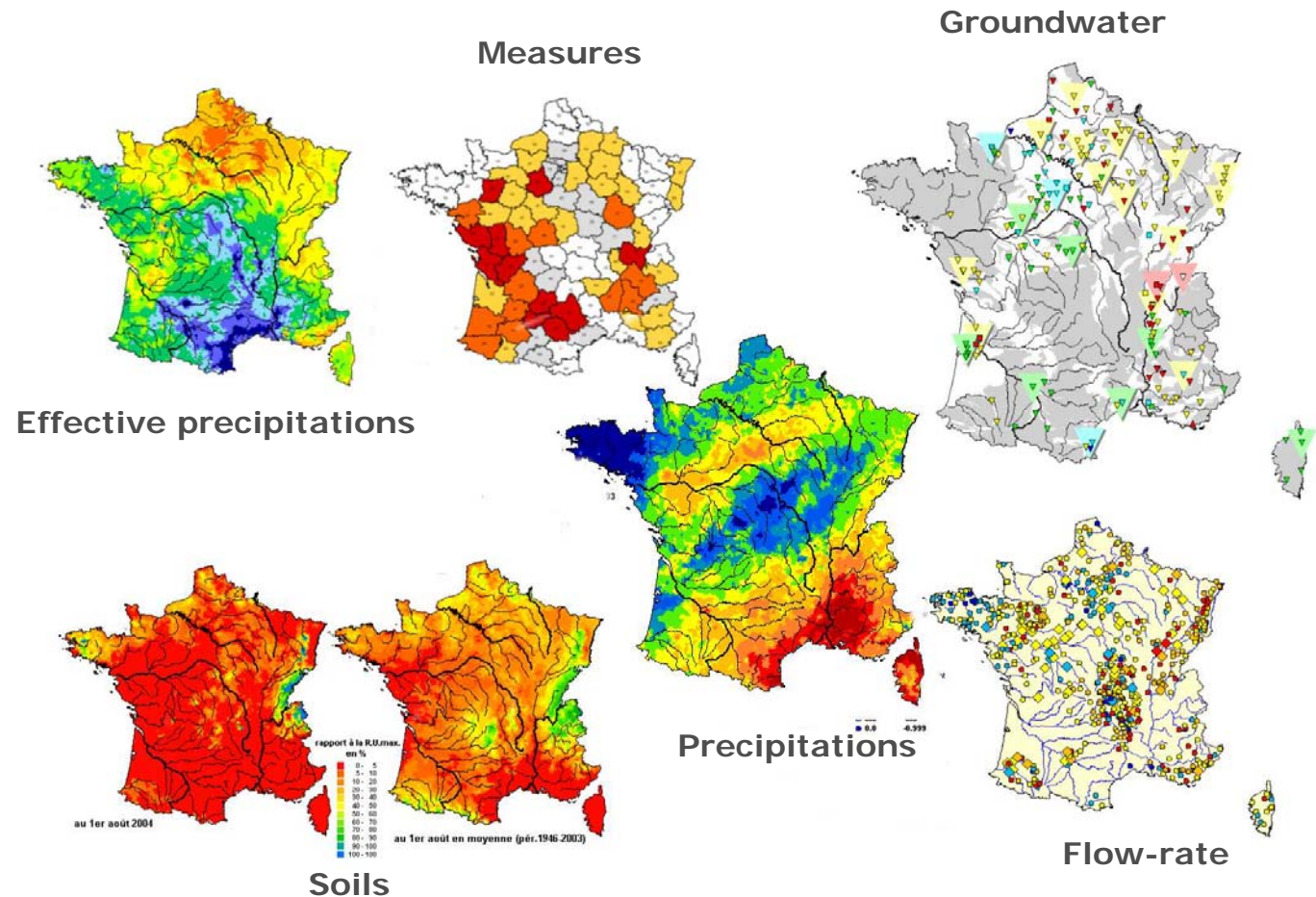
Monitoring

- Rain gauging
 - 5.000 rain gauges managed by Météo France
- Piezometric monitoring
 - 2.000 piezometers managed by water agency, State services or local authorities
 - a national data bank
- Hydrology monitoring
 - 3.500 data acquisition station
 - a national data bank



A monthly national hydrological report

To follow hydrology evolution, to assess and measure eventual droughts : www.rnde.tm.fr





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Before drought crisis periods = Anticipation

- Alert indicators
- Scenarios
- Follow-up Committee
- Communication
- Drought management plan by framework decrees

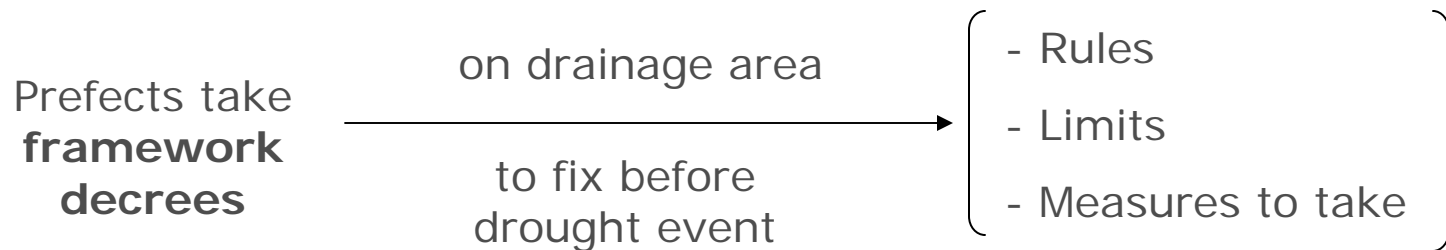


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Before drought crisis periods = Anticipation

Prefects as drainage area coordinators drive and coordinate state policy in control and management of basin water resources



Objective :

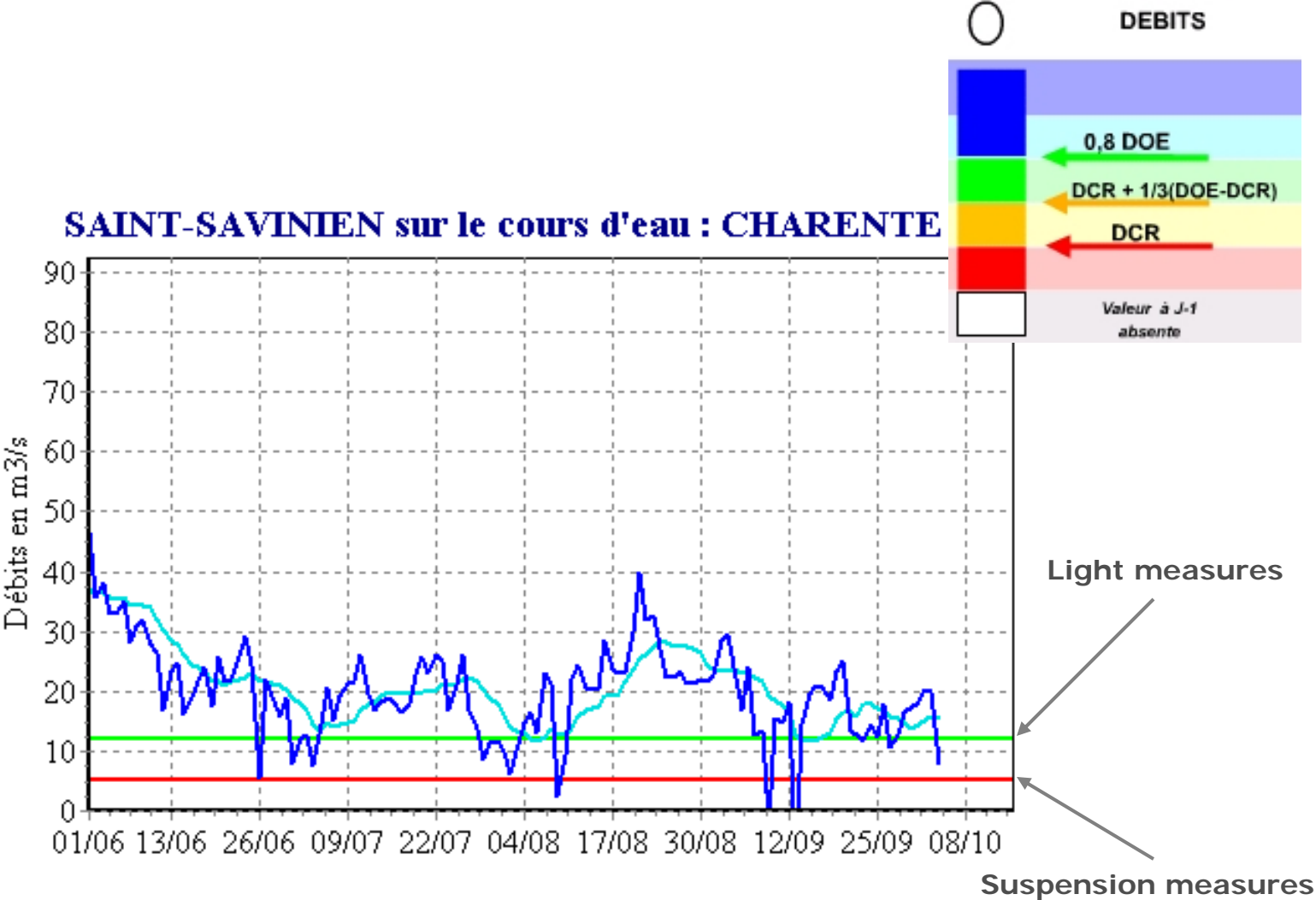
- Garantee uniqueness and coherence of state action
- Consolidate basin coordination
- Garantee upstream / downstream solidarity
- Make crisis management easier
- Garantee the principle of fairness between users



Flow-rate levels to applicate restriction measures



SAINT-SAVINIEN sur le cours d'eau : CHARENTE



Piezometric levels to applicate restriction measures



Piezomètres de:
Epieds-en-Beauce; Ouzouer-le-Marché; Fains-la-Folie; Trancrainville; Ruan; St-Léger-des-Aubées; Andonville; Mairvilliers; Batilly en Gâtinais

DIREN Cent
11/03/20





During drought crisis periods

- Overcome of informations and datas circulation
 - Crisis committees (national, drainage areas, regionals)
 - Communication
 - Restrictions or suspension measures by prefect decrees in application of framework decree
- (example : 50 % reduction of volumes attributed to irrigation)










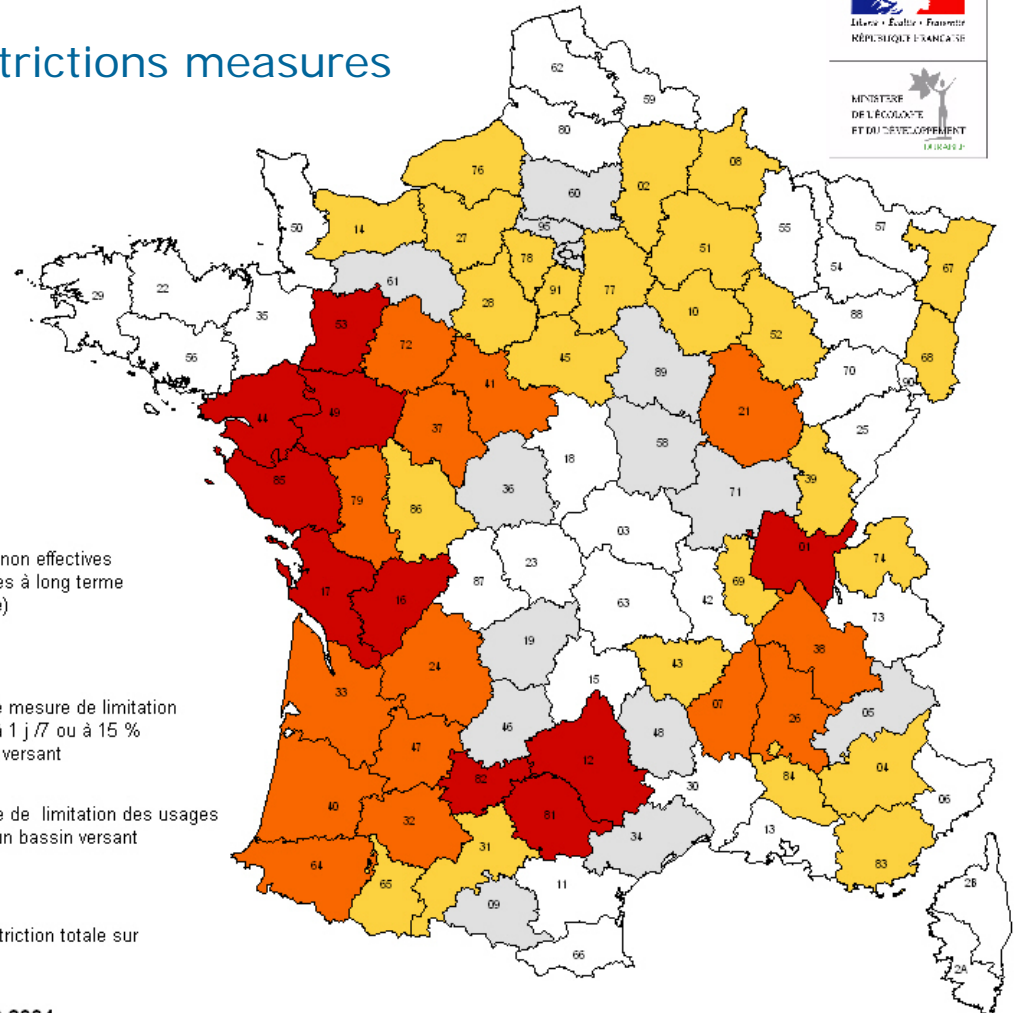
20th august 2004

49 departments takes restrictions measures



Etat des arrêtés de limitations des usages :

- Néant**  Aucun arrêté
- Mesures planifiées**  Mesures de limitation des usages non effectives mais des mesures ont été planifiées à long terme en cas de nécessité (arrêtés cadre)
- Mesures effectives**
 -  Niveau 1 - mesures limitées : toute mesure de limitation des usages inférieures ou égales à 1 j/7 ou à 15 % du volume sur au moins un bassin versant
 -  Niveau 2 - mesures fortes : mesure de limitation des usages supérieures à 1 j/7 sur au moins un bassin versant mais inférieures à 7 j/7
 -  Niveau 3 - restrictions totales : restriction totale sur au moins un bassin versant



CARTE ÉTABLIE A LA DIRECTION DE L'EAU le 20.08.2004

