The french Guiana Amazonian Park

Contributions to scientific knowledge about water and aquatic ecosystems

(Oyapock & Maroni basins - south of french Guiana)

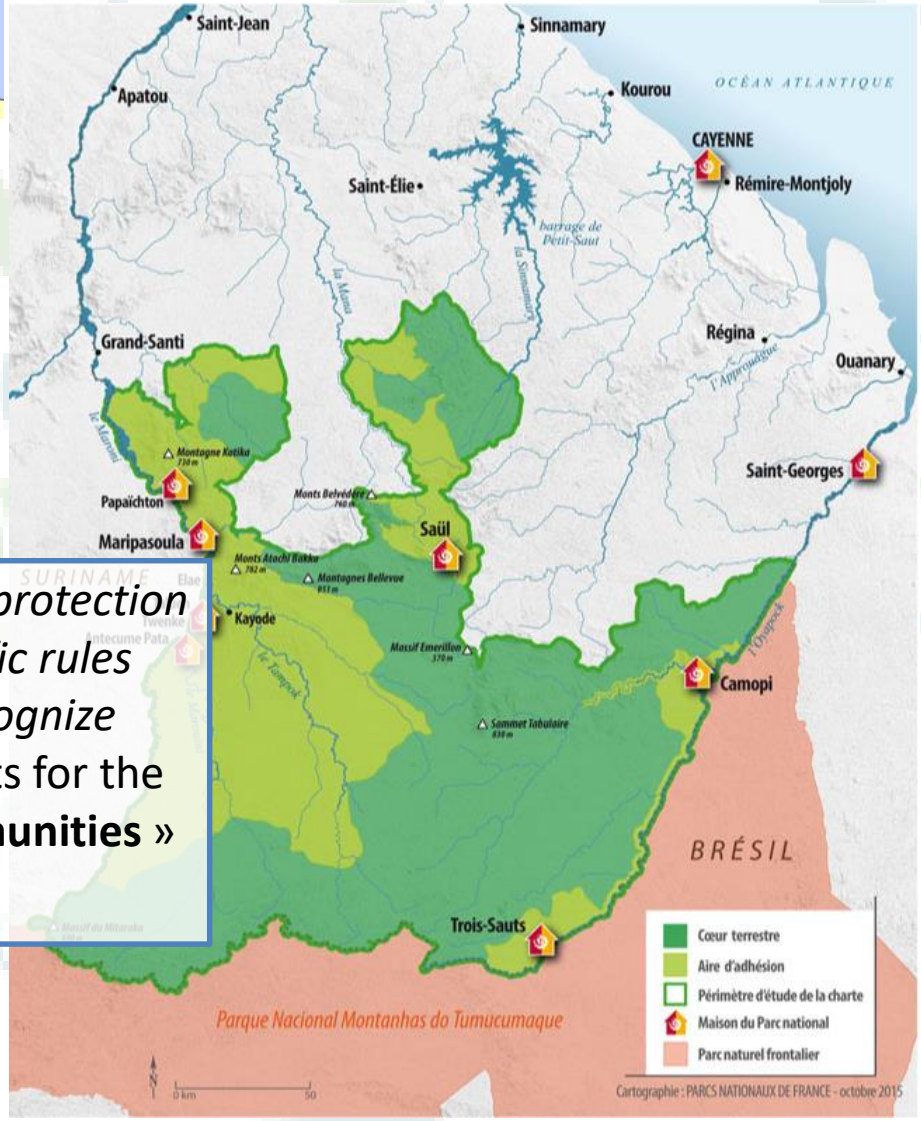
Pascal Vardon – 26/11/2019

BIO-PLATEAUX

Balance between conservation & sustainable development

- created in 2007
- 3,4 million ha
- 20 000 inhabitants

Core area



Buffer area

Under common Law

Priority : sustainable development

Environment protection with specific rules which recognize specific rights for the « **local communities** »

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Office de l'eau de la Guyane

Office International de l'Eau

Stakes related to water basins in the south of French Guiana: The national park stuggles against illegal goldmining

- **Illegal goldmining has been a plague before the creation of the national Park and still is.**

- Deforestation
- Destruction of aquatic habitats
- Water pollution (mercury, turbidity...)
- Sanitary risks (malaria...) for local communities
- Violence, insecurity
- Inhabitants lifestyle disrutpions

The national park stuggles against illegal goldmining

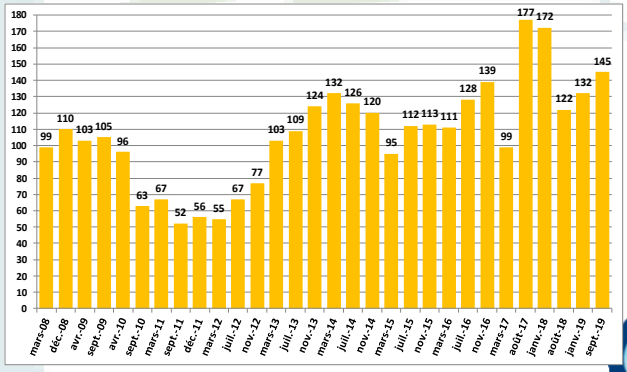
- **The national Park is invested in the struggle against illegal goldmining and in its monitoring**

- Participation in the campaigns of destruction of illegal sites

→ 15 sworn agents (armed)

- Counting of illegal sites in the NP (helicopter) twice a year

→ 145 illegal sites in sept. 2019



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The national park contributes to the monitoring of aquatic ecosystems

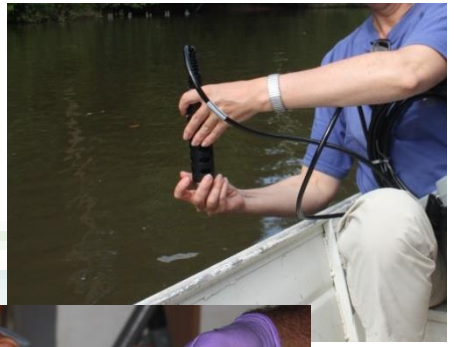
- **Monitoring of the quality of water**

-Turbidity : Network in French Guiana

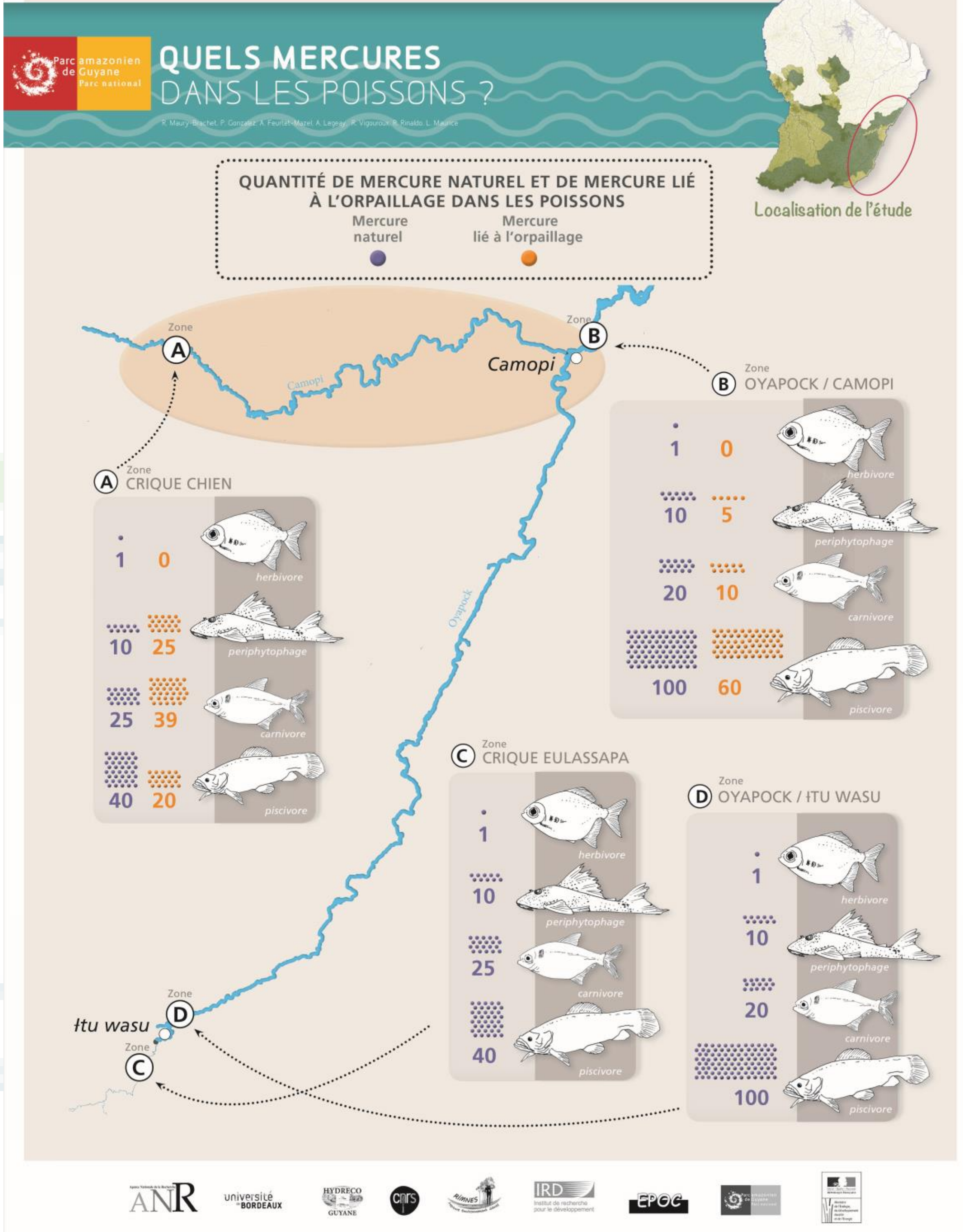
- Mercury : RIMNES* program (Oyapock river) revealed that :

  - **30 to 70% of the mercury found in fishes** harvested nearby mined areas **come from illegal mining**
  - 30 % of the mercury found in the sediments come from illegal mining

A similar program will be held on the Maroni river where people are 2 to 4 times more impregnated in mercury.



* RIMNES Program has been held from 2012 to 2015 by IRD, CNRS Bordeaux, Université de Bordeaux, Parc amazonien de Guyane and funded by the Agence Nationale de la Recherche

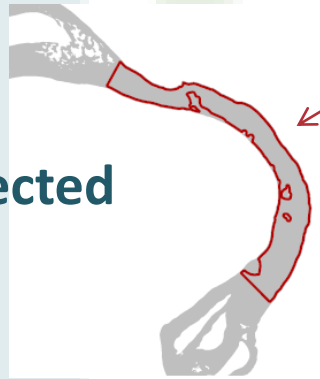


Parc amazonien de Guyane Parc national
QUELS MERCURES
DANS LES POISSONS ?
R. Maury-Brachet, P. Gonzalez, A. Feurtet-Mazel, A. Legeay, R. Vigouroux, R. Rinaldo, L. Maurice
Localisation de l'étude
QUANTITÉ DE MERCURE NATUREL ET DE MERCURE LIÉ À L'ORPAILLAGE DANS LES POISSONS
Mercure naturel
Mercure lié à l'orpaillage
Zone A
Zone B
Camopi
Camopi
Oyapock
Zone A CRIQUE CHIEN
1 0 herbivore
10 25 periphytophage
25 39 carnivore
40 20 piscivore
Zone B OYAPOCK / CAMOPI
1 0 herbivore
10 5 periphytophage
20 10 carnivore
100 60 piscivore
Zone C CRIQUE EULASSAPA
1 herbivore
10 periphytophage
25 carnivore
40 piscivore
Zone D OYAPOCK / ƚTU WASU
1 herbivore
10 periphytophage
20 carnivore
100 piscivore
Zone D
ƚtu wasu
Zone C
ANR
université BORDEAUX
HYDRECO GUYANE
cnrs
IRD Institut de recherche pour le développement
EPOC

Focus on the observatory of turbidity of the upper Maroni river implemented by the national park

- **Objectives**

- Analyse and make visible the consequences of goldmining
- Compare the levels of turbidity : between the french and the surinamese bank / between the upper and lower part of the main rivers which flow into the Maroni/Lawa
- Allow any citizen to have easy access to this data



Step 1 : 14 “sites” have been selected

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Step 2 : downloading and treatment of Sentinel 2 images

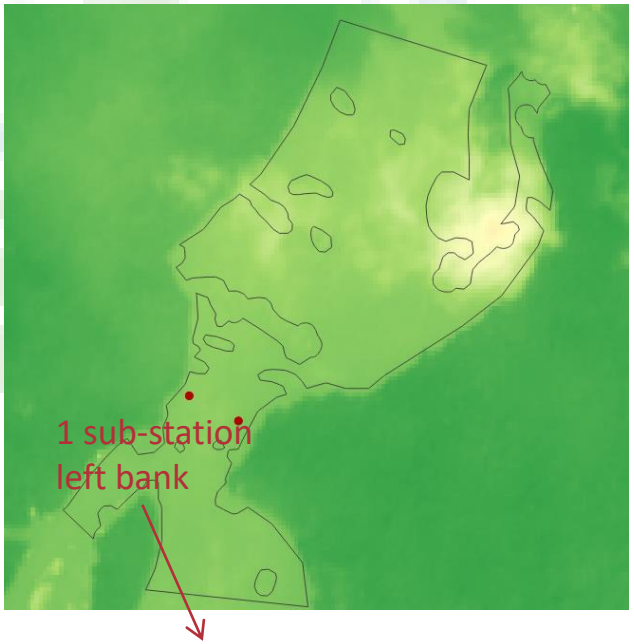
→ 102 Sentinel 2 images treated (january 2017 – october 2019)

Use of the algorithm developed by BRGM to determine turbidity out of satelite images

Step 3 : Positioning of “turbidity” stations

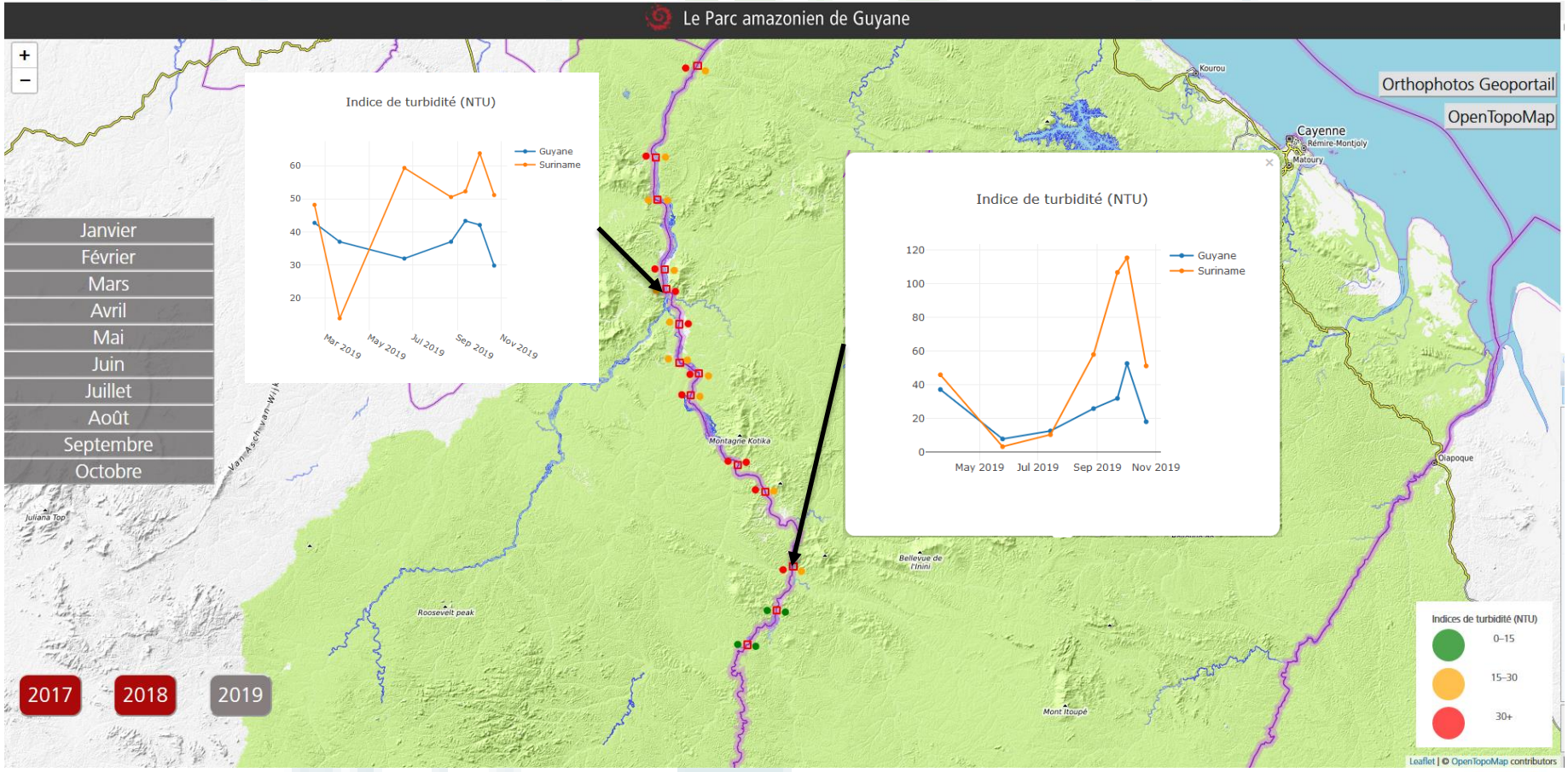
Step 4 : Retrieval of turbidity index for each station and each image

Step 5 : Data dissemination



Web-based interface on the National Park website

- http://carto.parc-amazonien-guyane.fr/carto-turbidite/



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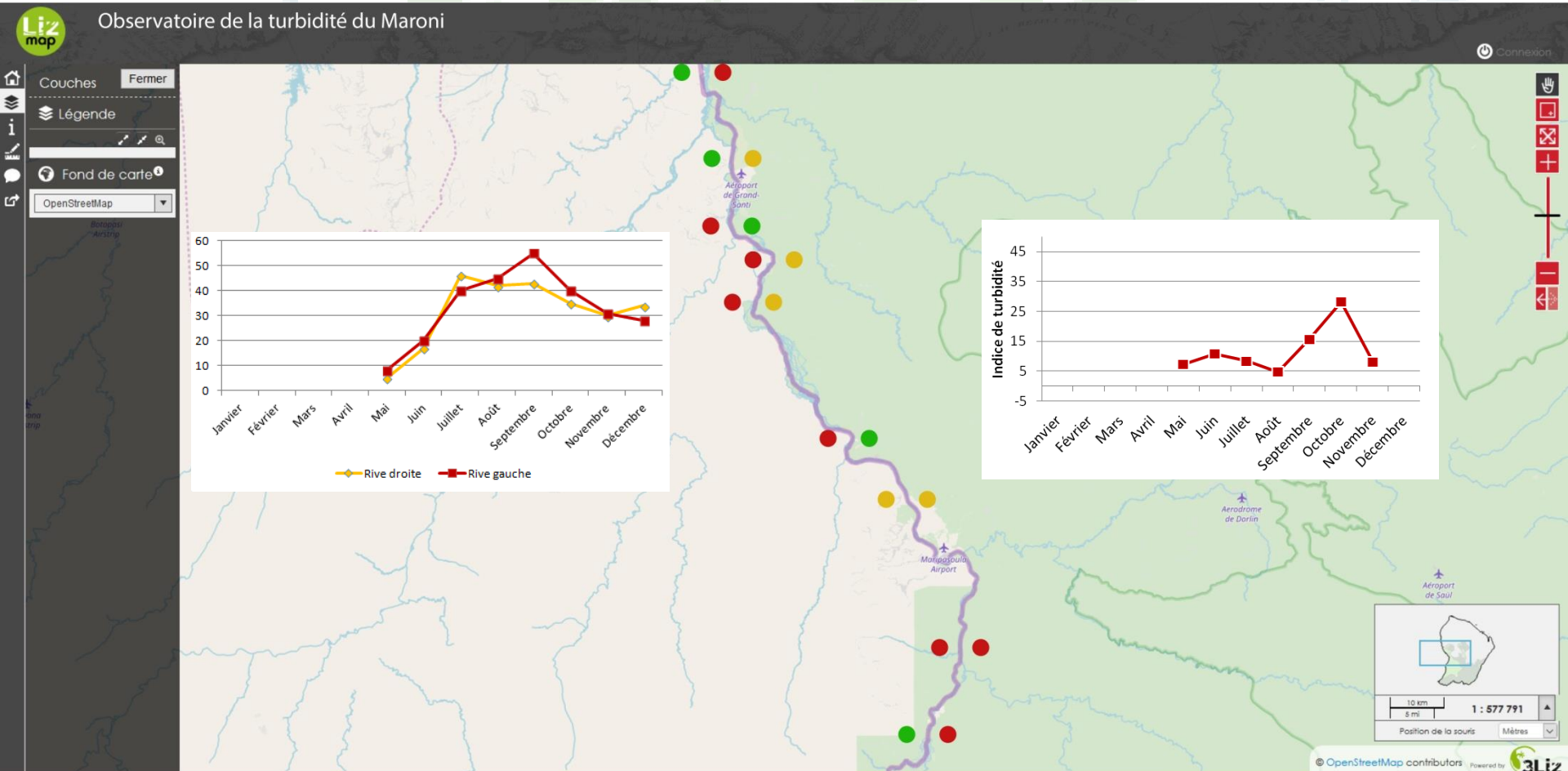
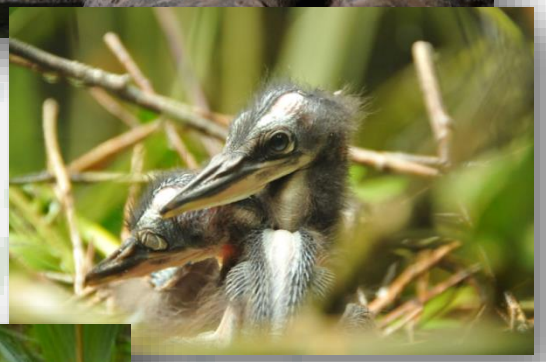


The national park contributes to the monitoring of aquatic ecosystems

- **Monitoring of some key species**

- Giant Otter (*Pteronoura briliensis*):
  - Good indicator of the water turbidity (regional protocole)
  - Measure the reconquest of formerly mined sites
- Tapir (*Tapirus terrestris*):
  - Indicator of the hunting pressure, not sensitive to water turbidity
  - Try to evaluate hunting pressure in mined areas
- Agami Heron (*Agamia agami*)
  - 2 colonies in French Guiana (Kaw and Elahé)
  - Member of the natwork Heron agami Working Group



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GEPOG

GMF

KWATA
Etude - Conservation
Faune de GUYANE

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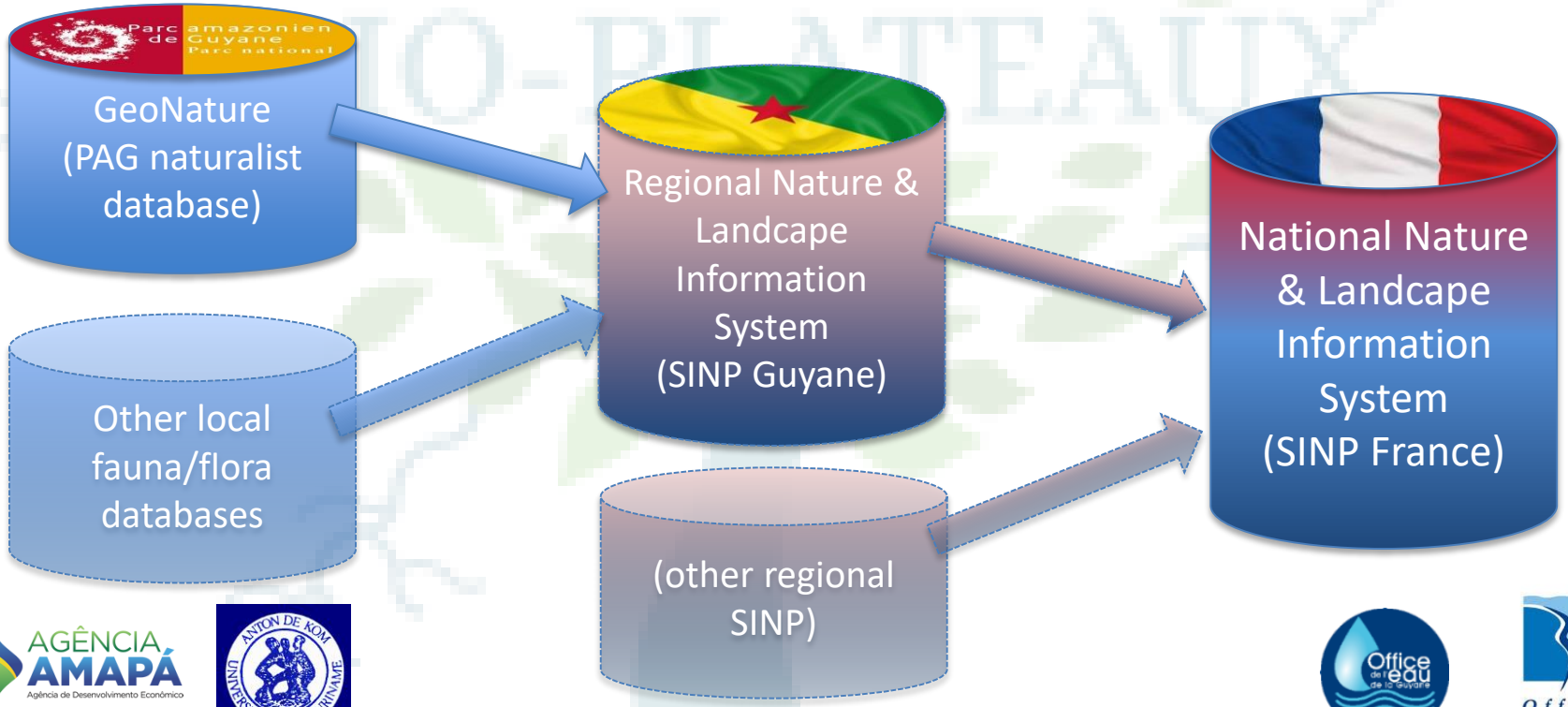
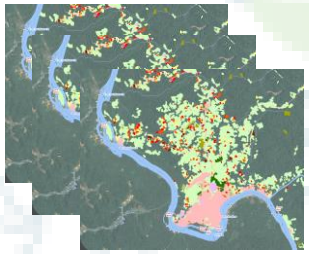
Important contribution to a national data base about fauna and flora

- **From organisation database to national devices**
- About 50 000 data from PAG opportunist observations, scientific programs (inner or outer) & partners

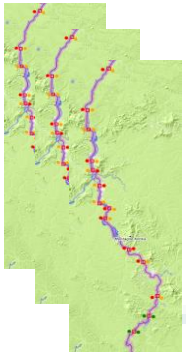


The NP publishes these environmental data on local and national **spatial data infrastructures (SDI)**

Land uses 2005 to 2018



Turbidity index 2017 to 2019



GÉOGUYANE

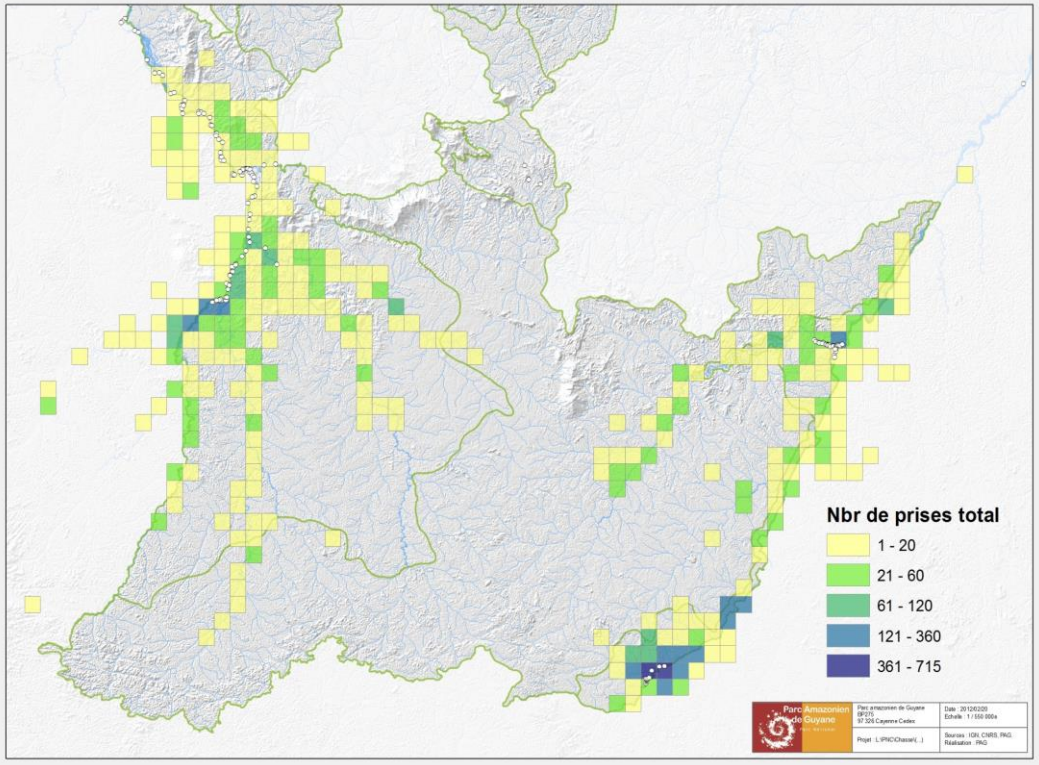
geo.data.gouv.fr

Free access to all web users

The NP implements an observatory of uses by the communities : hunting, land use,...

The “hunting program”

- **Traditional practices are not limited by countries boundaries**
- 2 years of working with inhabitants of Maroni and Oyapock rivers (more than 5000 testimonies)
- Restitutions on studying sites directly to the inhabitants



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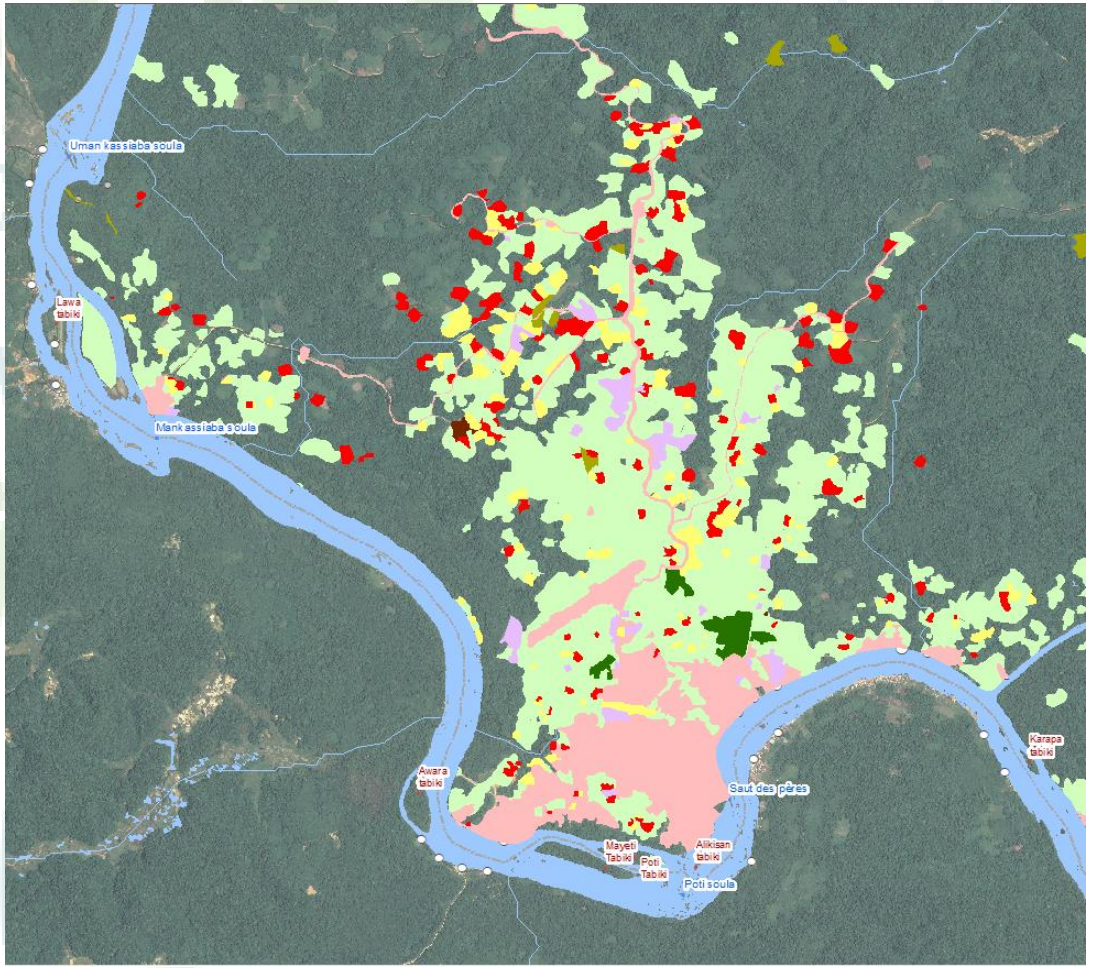
land use monitoring

- **Land cover and uses has been mapped yearly since 2005**

Slash and burn field current year
Slash and burn field year - 1
Slash and burn field year - 2
Permanent field
Pasture land
Forest fallows
Secondary softwood
Specific plant formation
Urban landscape
Bare ground



- **Photo-interpretation mapping**

The National Park documents and accompanies practices of the communities linked to natural resources

The Upper Maroni fisheries management program (2013 – 2019)

- Objectives :
  - Describe the actual fishing habits on 7 villages
  - Evaluate the impact of the fishing habits on the stat of fish resources
- Outcomes :
  - Wayana and Teko communities : biomass harvested proportional to the population size of the villages
  - Fishing remains a pillar of the identity
  - People feel threatened by mining from both sides and notice a bad influence on the water resources
  - On the 18 species studies, *Hoplias aimara* population from Papaïchton show clear signs of depletion (mining impacts? fishing impacts?)

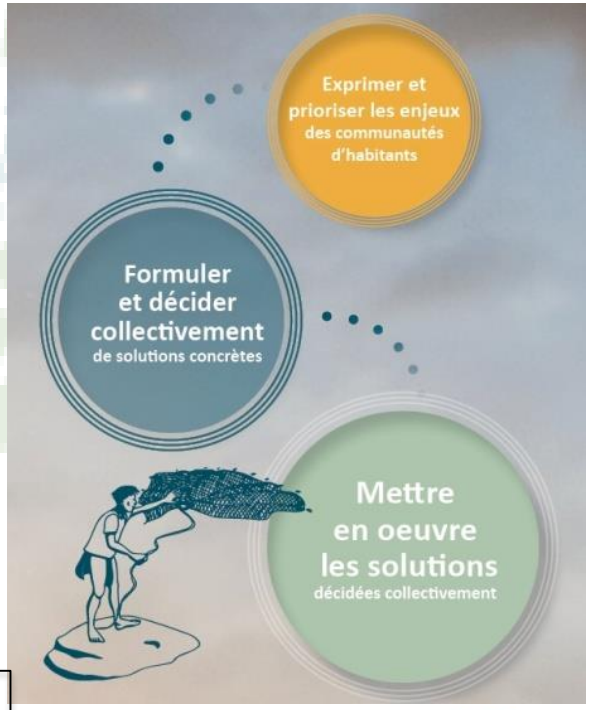
Towards management measures...

- **Terra Maka'andi program**

- 2019 – 2021 on the upper Oyapock and upper Maroni

- 1 coordinator, 6 local facilitators - mediators

- Co-constructing with the local communities measures to improve the management of pratices linked to natural ressources



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Thank you for your attention

Ce support a été réalisé avec le soutien financier de l'Union Européenne. Les opinions qu'il comporte n'engagent que sont auteur et ne reflètent pas nécessairement la position de l'Union Européenne.