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Traitement, valorisation des données de fréquentation

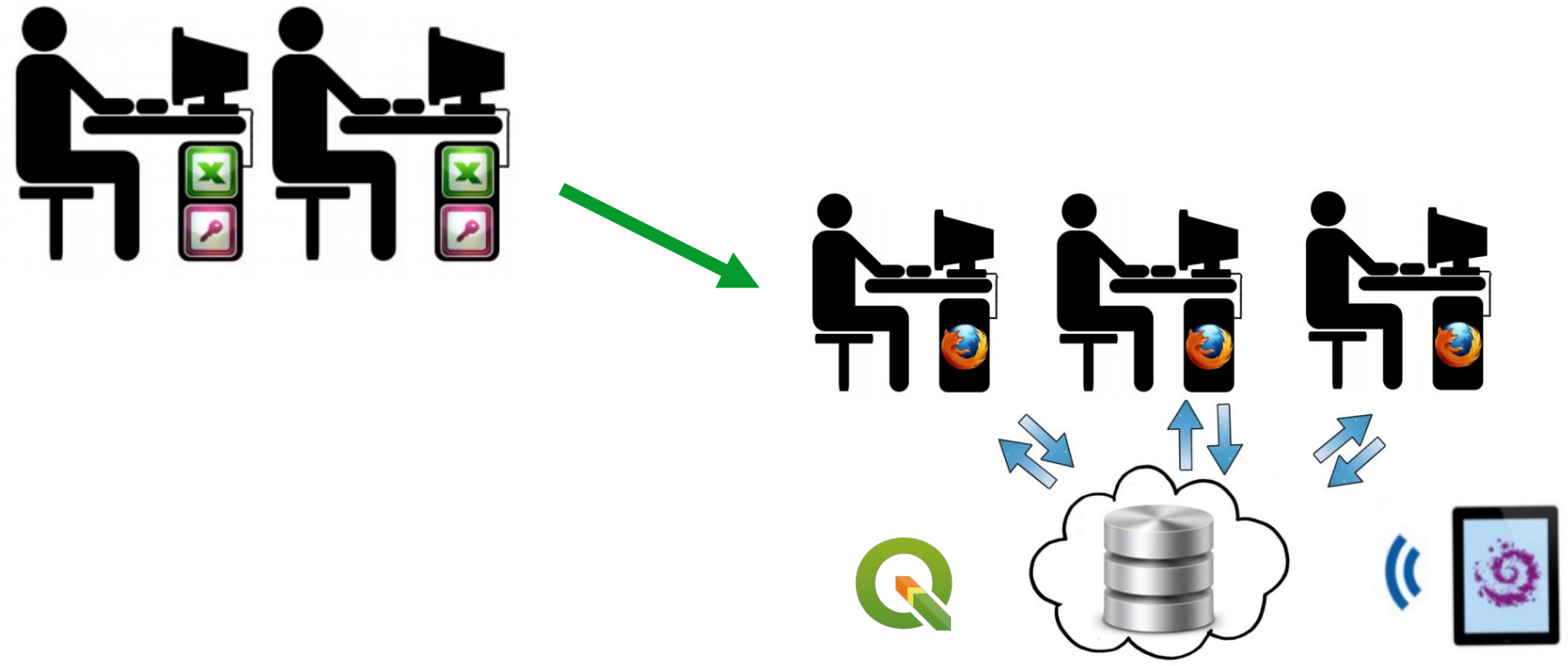
Un exemple de gestion des données au Parc national des Écrins

Camille Monchicourt, responsable du pôle SI

10/03/2026

Parc national du Mercantour
Parc national des Ecrins
Parc national de la Vanoise
Regione Piemonte
Aree Protette Alpi Marittime
Aree Protette Alpi Cozie
PARCO ALPI LIGURI
Parco Nazionale Gran Paradiso

Modernisation des outils et des chaines de travail
Modernizzazione degli strumenti e del flusso di lavoro



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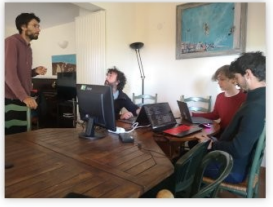
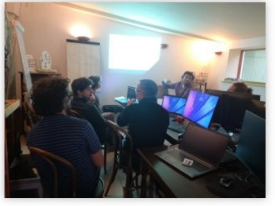
Open source – Créer des communautés / Open source – Costruire comunità





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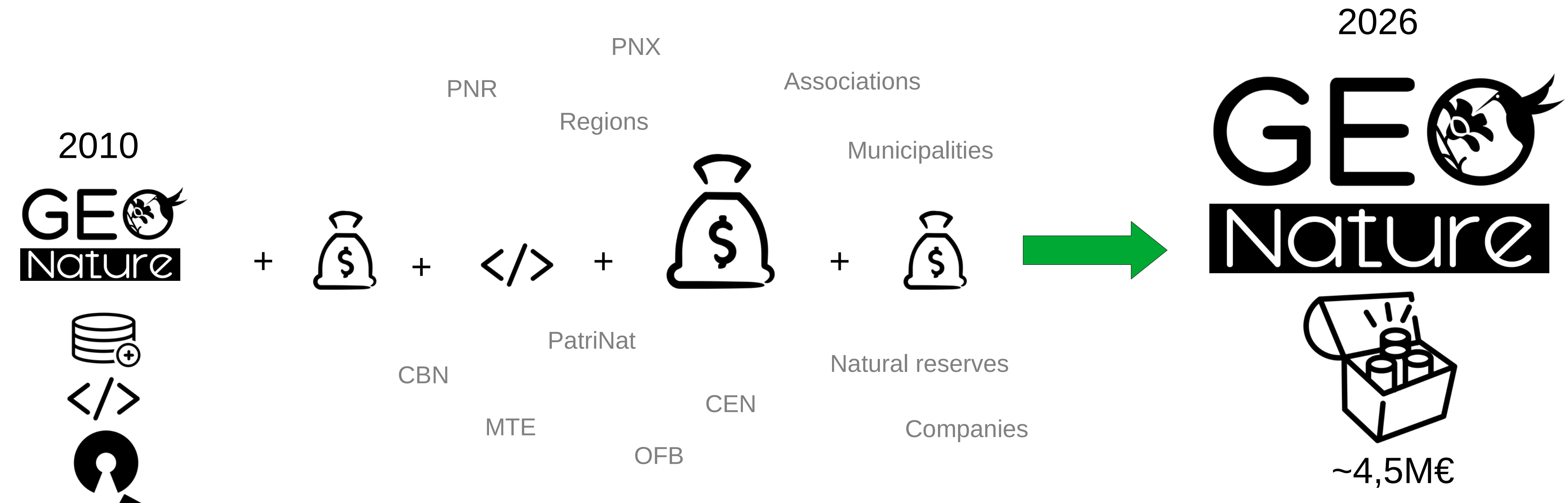
Open source – Mise en commun des ressources / Messa in comune delle risorse

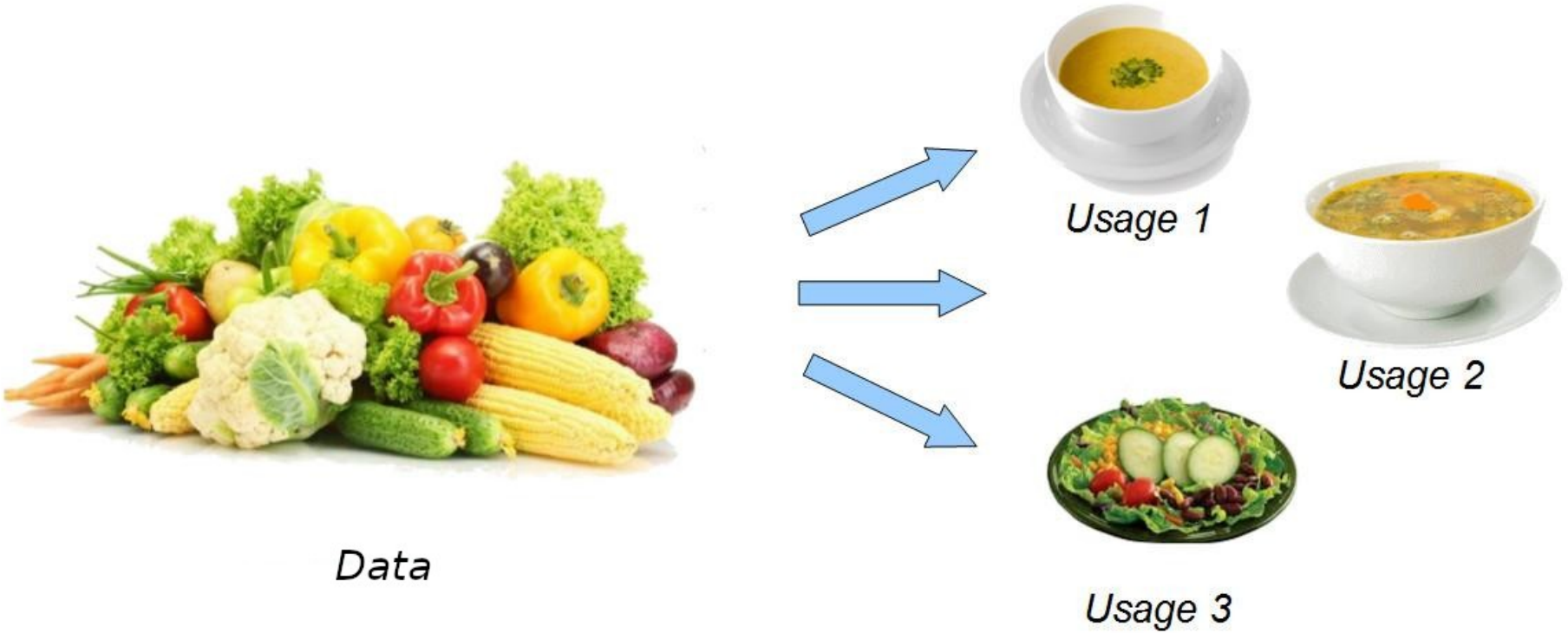


Bénéficier librement des investissements antérieurs / Concentrer les ressources de chaque structure sur le déploiement, l'animation et l'enrichissement d'un outil partagé et commun, plutôt que de refinancer chacun des outils similaires

Beneficiare liberamente degli investimenti precedenti / Concentrare le risorse di ciascuna struttura sull'implementazione, l'animazione e l'arricchimento di uno strumento condiviso e comune, piuttosto che rifinanziare ciascuno degli strumenti simili.

Icons by the Noun Project

Fonds publics > Données publiques > Données ouvertes
Denaro pubblico > Dati pubblici > Dati aperti



https://www.ecrins-parcnational.fr/actualite/parc-national-ecrins-deconfine-donnees-biodiversite
https://www.ecrins-parcnational.fr/actualite/parc-national-ecrins-libere-donnees

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istSOS : une base de données pour des capteurs de mesures physiques et de la fréquentation
IstSOS : un database per sensori di misura fisica e frequentazione umana

Contexte :

- Augmentation du nombre de données sans base de données structurée - Aumento del numero di dati senza database strutturato
- Données et matériels hétérogènes - Dati e materiali eterogenei
- Des données de séries temporelles et quantitatives - Serie storiche e dati quantitativi

Enjeux – Le sfide :

- Structurer et stocker - Strutturazione e archiviazione
- Harmoniser et standardiser – Armonizzazione e standardizzazione
- Partager et valoriser – Condividere e aggiungere valore

eco compteur

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	A	B
1	date	person
2	2023-09-01T00:00:00	NaN
3	2023-09-01T01:00:00	NaN
4	2023-09-01T02:00:00	NaN
5	2023-09-01T03:00:00	NaN
6	2023-09-01T04:00:00	NaN
7	2023-09-01T05:00:00	NaN
8	2023-09-01T06:00:00	1
9	2023-09-01T07:00:00	3
10	2023-09-01T08:00:00	26
11	2023-09-01T09:00:00	78
12	2023-09-01T10:00:00	27
13	2023-09-01T11:00:00	30
14	2023-09-01T12:00:00	17
15	2023-09-01T13:00:00	11
16	2023-09-01T14:00:00	17
17	2023-09-01T15:00:00	26

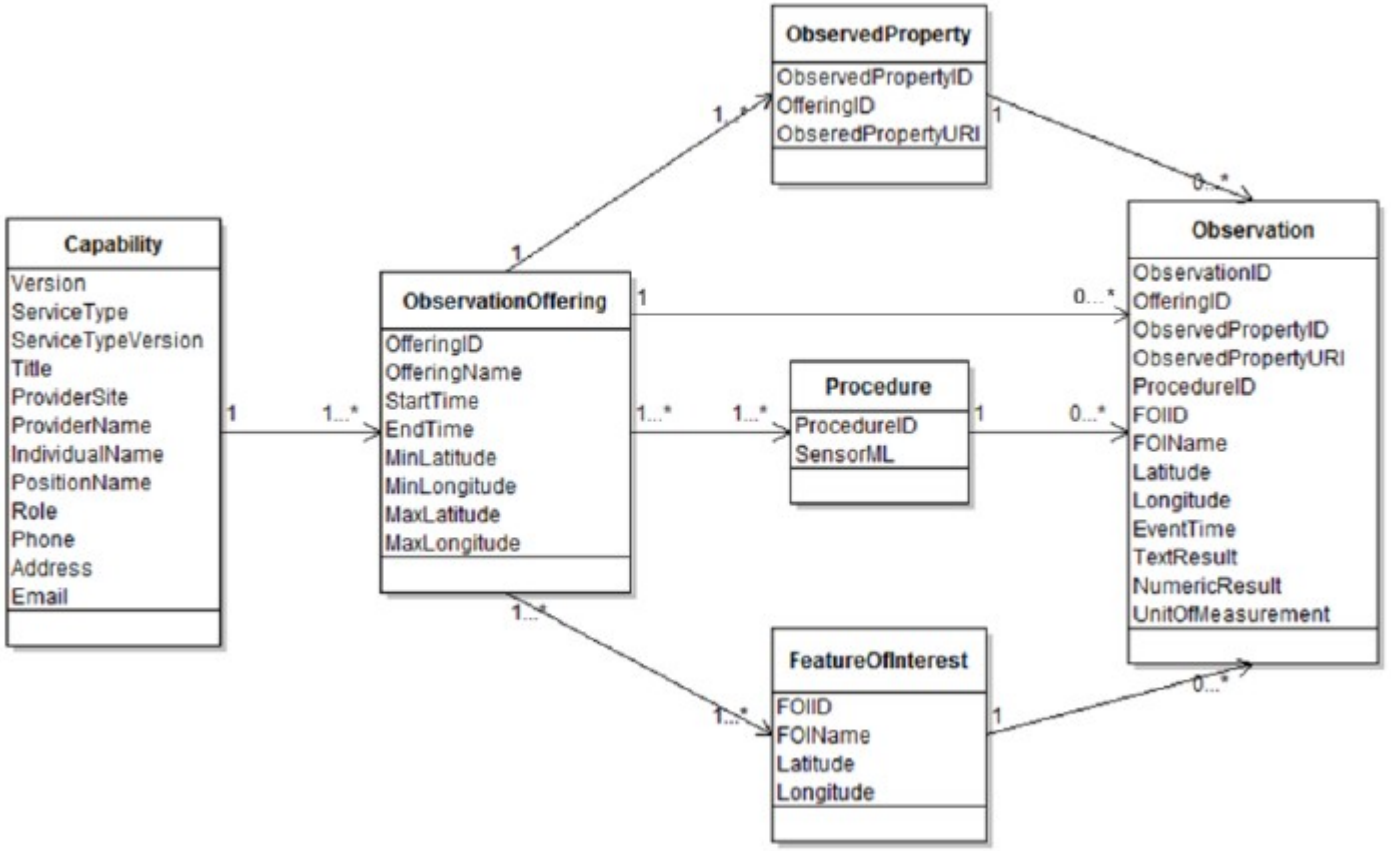
	A	B	C
1	date	person	animal
2	2024-01-08T11:00:00	2	NaN
3	2024-01-08T17:00:00	1	NaN
4	2024-01-09T22:00:00	2	NaN
5	2024-01-10T00:00:00	1	NaN
6	2024-01-10T13:00:00	3	NaN
7	2024-01-10T17:00:00	2	NaN
8	2024-01-10T18:00:00	2	NaN
9	2024-01-11T17:00:00	1	NaN
10	2024-01-13T11:00:00	NaN	NaN
11	2024-01-13T12:00:00	2	1
12	2024-01-13T17:00:00	5	1
13	2024-01-14T04:00:00	NaN	1
14	2024-01-14T05:00:00	NaN	NaN
15	2024-01-15T10:00:00	5	NaN
16	2024-01-15T11:00:00	3	NaN
17	2024-01-15T15:00:00	1	NaN
18	2024-01-17T15:00:00	NaN	1

	A	B
1	date	soil-temperature
3176	2020-06-16T01:00:00+00:00	11.139
3177	2020-06-16T02:00:00+00:00	10.846
3178	2020-06-16T03:00:00+00:00	10.455
3179	2020-06-16T04:00:00+00:00	10.161
3180	2020-06-16T05:00:00+00:00	10.161
3181	2020-06-16T06:00:00+00:00	11.236
3182	2020-06-16T07:00:00+00:00	13.173
3183	2020-06-16T08:00:00+00:00	15.378
3184	2020-06-16T09:00:00+00:00	16.618
3185	2020-06-16T10:00:00+00:00	16.046
3186	2020-06-16T11:00:00+00:00	17.95
3187	2020-06-16T12:00:00+00:00	18.901
3188	2020-06-16T13:00:00+00:00	18.711
3189	2020-06-16T14:00:00+00:00	17.475
3190	2020-06-16T15:00:00+00:00	16.618
3191	2020-06-16T16:00:00+00:00	15.951

	A	B
1	date	lake-water-height
2	2021-01-27T00:00:00+00:00	12.051923
3	2021-01-27T01:00:00+00:00	12.048872
4	2021-01-27T02:00:00+00:00	12.045821
5	2021-01-27T03:00:00+00:00	12.041244
6	2021-01-27T04:00:00+00:00	12.036668
7	2021-01-27T05:00:00+00:00	12.033617
8	2021-01-27T06:00:00+00:00	12.027515
9	2021-01-27T07:00:00+00:00	12.021413
10	2021-01-27T08:00:00+00:00	12.018362
11	2021-01-27T09:00:00+00:00	12.013785
12	2021-01-27T10:00:00+00:00	12.007683
13	2021-01-27T11:00:00+00:00	12.004632
14	2021-01-27T12:00:00+00:00	12.000056
15	2021-01-27T13:00:00+00:00	11.995479
16	2021-01-27T14:00:00+00:00	11.990903
17	2021-01-27T15:00:00+00:00	11.987852

SOS (Sensor Observation Service)

Standard international relatif aux données des capteurs / Standard internazionale per i dati dei sensori



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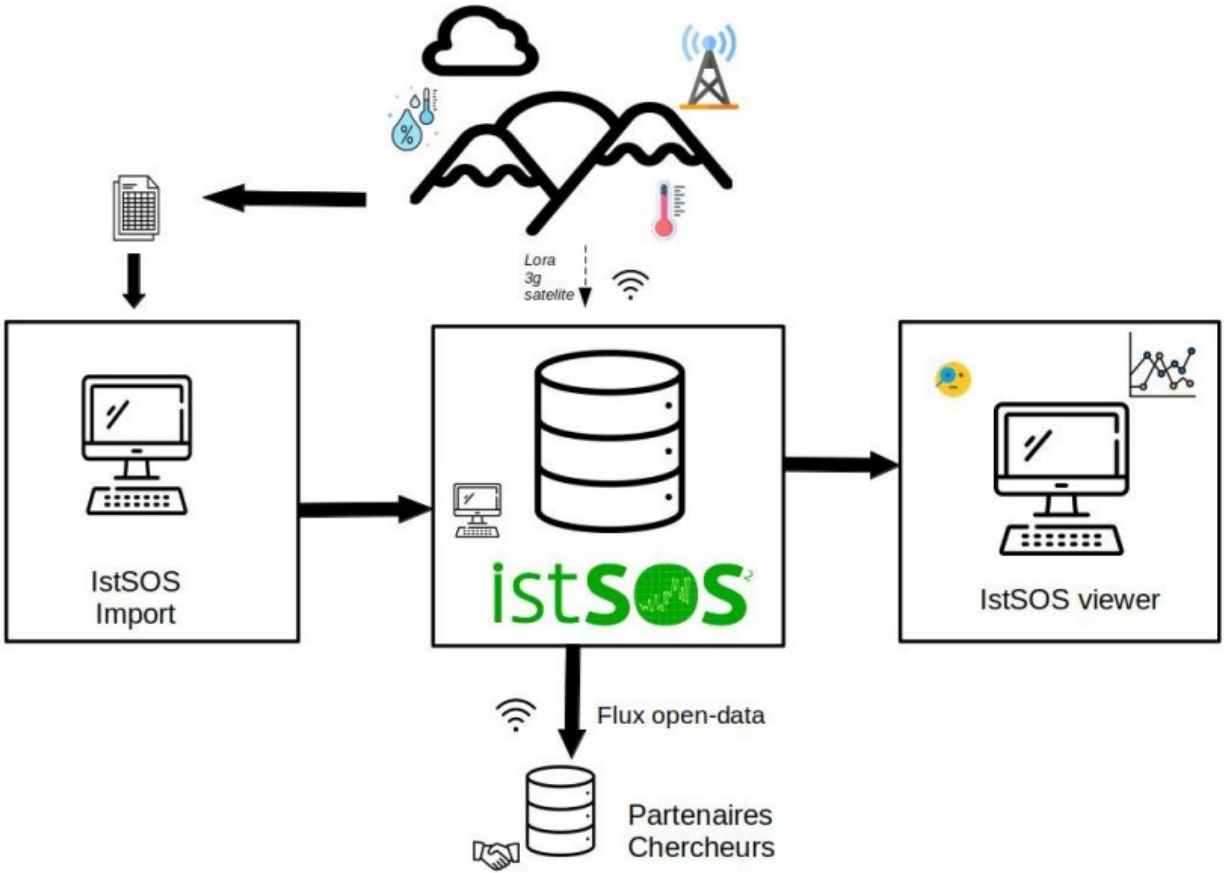
Une solution depuis 2022
Una soluzione dal 2022

Easily manage your sensor network and distribute your data in a standard way

« Open software for open standard. Open standard for open data. Open data for a better world. »

Institute of Earth science - SUPSI
University of Applied Sciences and Arts of Southern Switzerland

https://istsos.org


Lora
3g
satelite
IstSOS
Import
istSOS
IstSOS viewer
Flux open-data
Partenaires
Chercheurs

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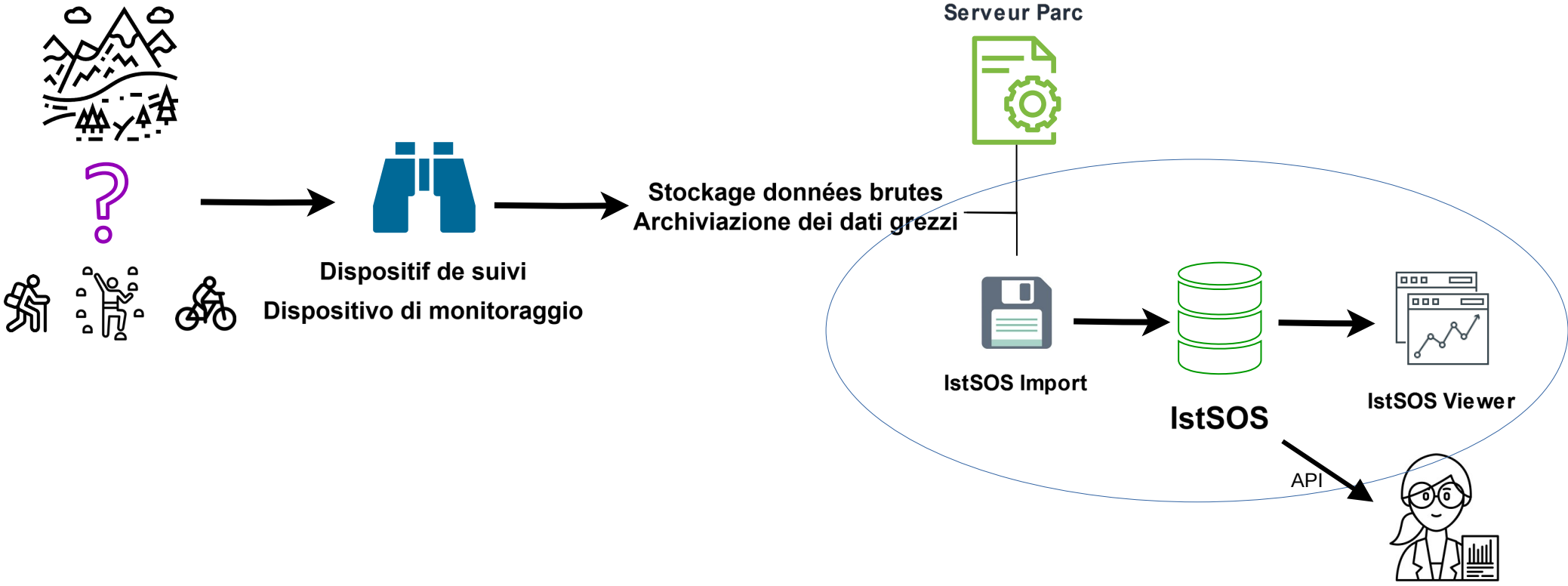
Une nouvelle chaîne de travail
Una nuova catena di lavoro



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1. Inventaire des dispositifs
Inventario dei dispositivi

frequentation > Edit procedure

Submit

Procedure:

General info

Sensor ID: 0214d64e66b311ef9cfc020000905b4e

Name: EcocompteurDanchere

Description: Ecocompteur 2 dalles sur le sentier du Lauvitel et GR54. Site de comptage depuis 2008, anciennement pyro

Keywords: Ecocompteur,Lauvitel,GR54

Classification

System type: insitu-fixed-point

Sensor Type: Ecocompteur _dalle

Location

FOI name: Danchere

EPSG: 4326

Coordinates: X: 6.07565 Y: 44.98697 Z: 1005

Outputs

Name	Description	Definition	Uom	From	To	List
person		urn:ogc:def:parameter:x-istsos:1....	null			

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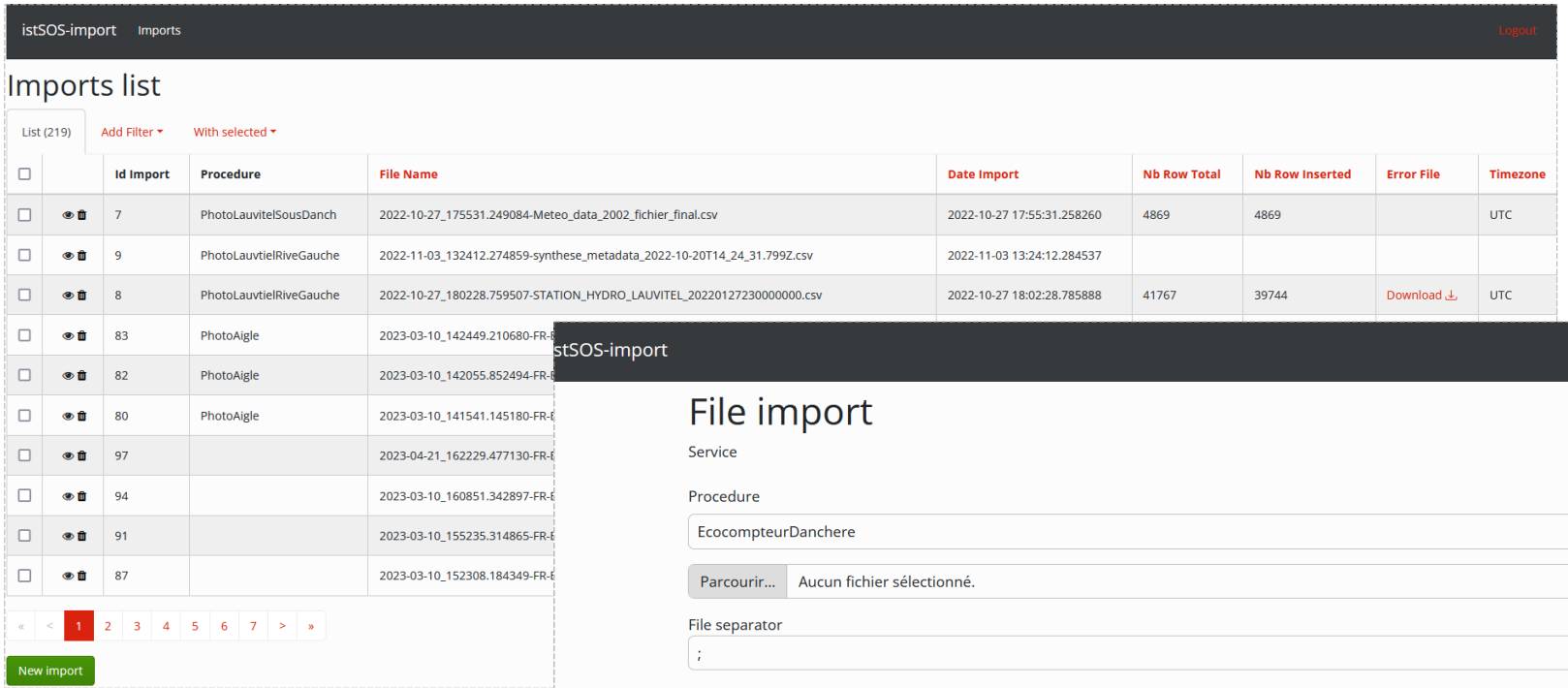
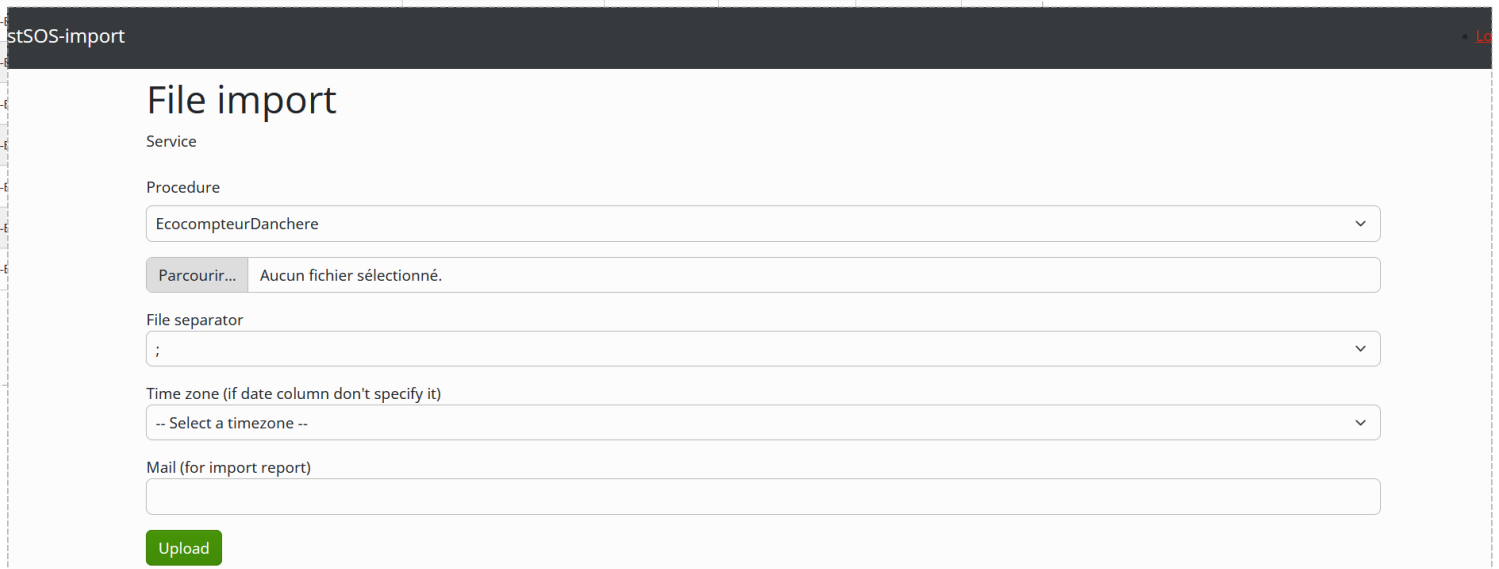
2. Import des données par dispositif
Importazione dei dati per dispositivo





https://github.com/PnEcrins/istSOS-import

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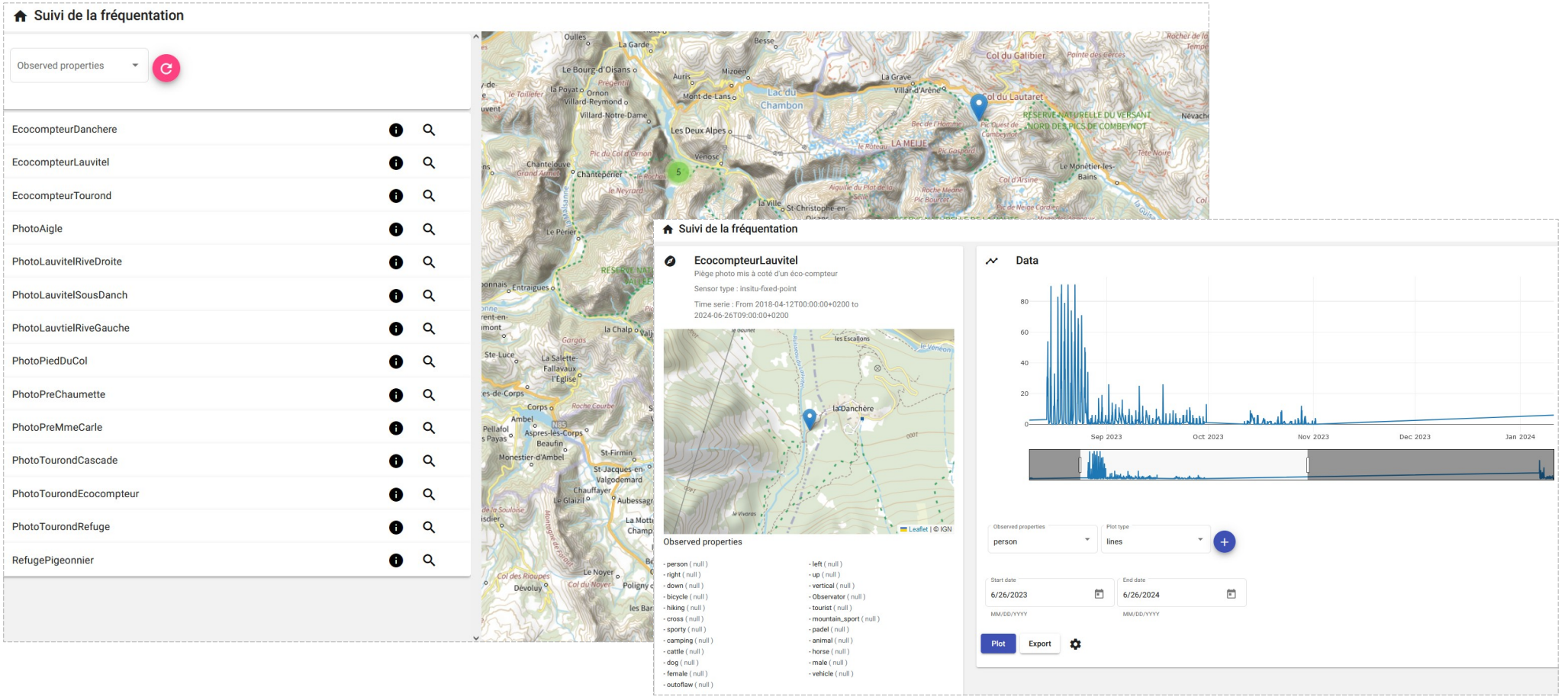
3. Visualisation des données
Visualizzazione dei dati



http://5.135.42.176/frequentation/#/

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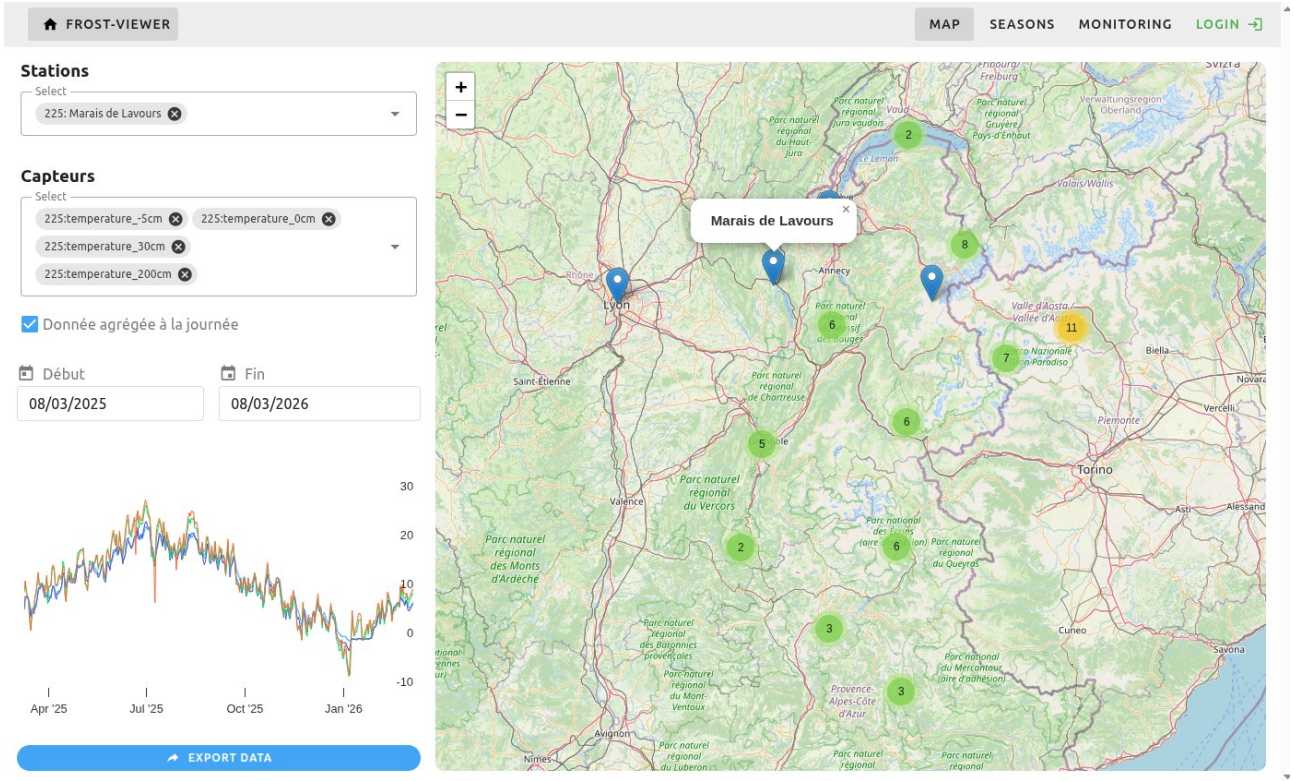
4. Autres solutions
Altre soluzioni



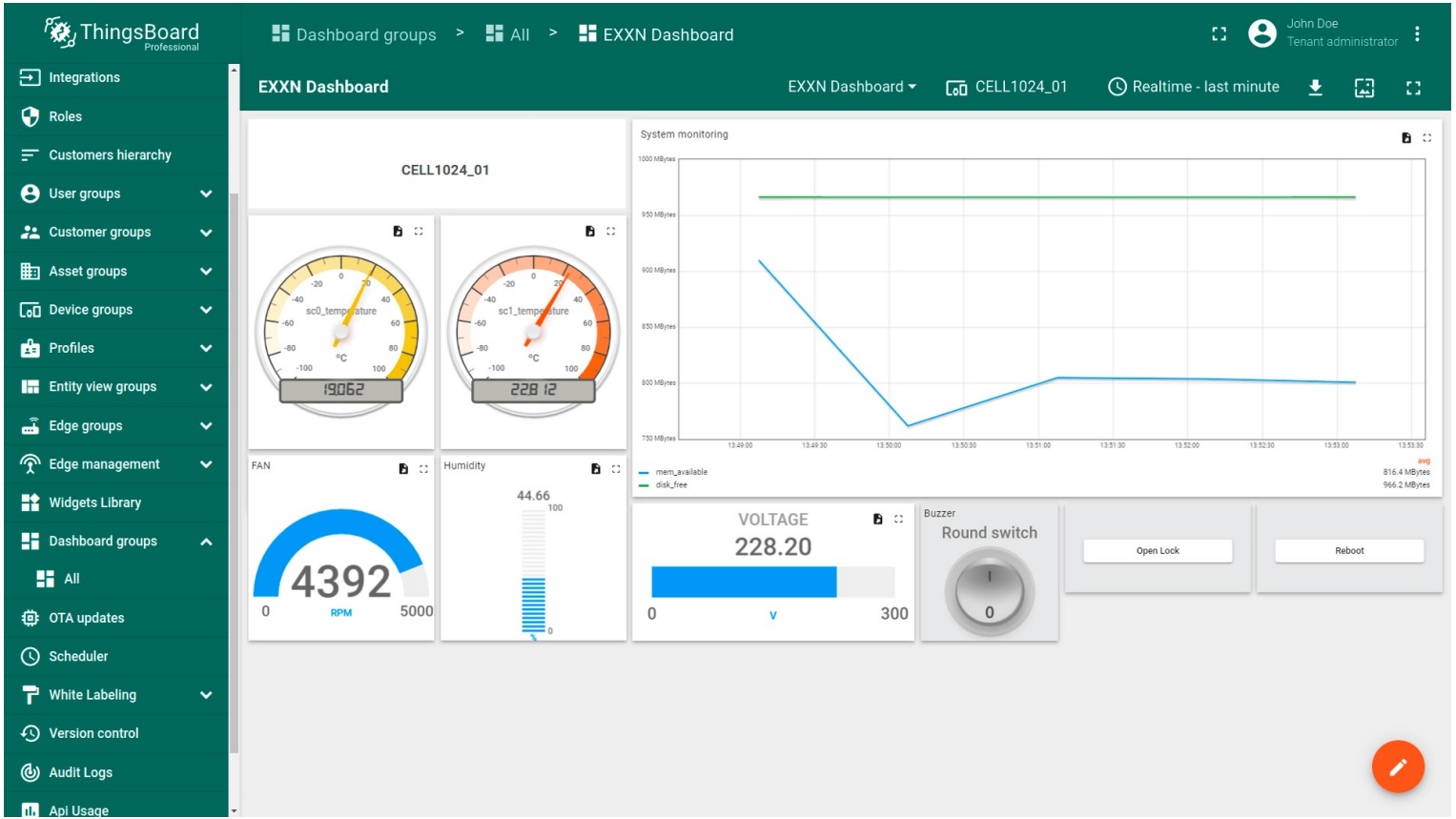
FROST Server

FROST / OGC SensorThings API

CREA -MONT-BLANC-

https://frost-viewer.monitoring.creamontblanc.org

4. Autres solutions
Altre soluzioni



ThingsBoard

https://thingsboard.io

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GRENOBLE INP UGA
POLYTECH GRENOBLE

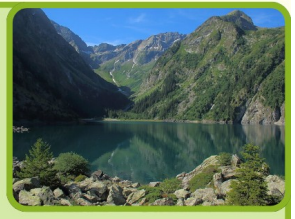
YOLOV8 ATTENDANCE

OFB OFFICE FRANÇAIS DE LA BIODIVERSITÉ
Parc national des Ecrins

Students: Aurelien Coste, Florian Machenaud
Esteban Thevenon, Lony Riffard
Supervisor : Didier Donsez
Tutors : Pierrick Navizet, Mathieu Garel

DESCRIPTION

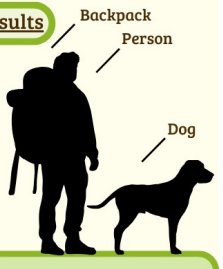
Ecrins national park is a French park near Grenoble in which photo traps are set to take pictures of everything that passes in front of them.
Those pictures are used to monitor the frequentation of the park quantitatively, in other words how many people pass through a certain path, how many dog, bike, etc...



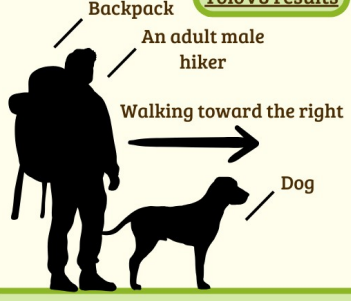
WHAT WE HAD: YOLOV4 (AI MODEL)

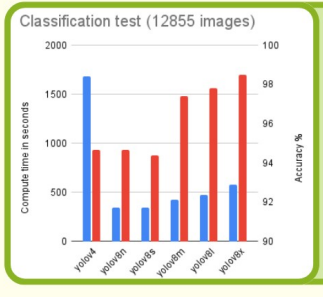
To detect people, objects and animals, the park uses the AI model of Ultralytics, YoloV4. This model is capable of recognizing people, dogs, backpacks, etc... However, qualitatively speaking, it does not do much.
From the time when this solution was made, several upgrades were released. That is why our work aims to upgrade the model from v4 to v8 the newest version! (almost see "for the future")

YoloV4 results



YoloV8 results





WHAT WE HAVE: YOLOV8 POSE & DETECTION

This version of the model is faster, more accurate, able to estimate the age of people and detect their equipment. Furthermore, it has a second version made to detect the pose of them, allowing us to add some quality assessment to the data, such as the walking direction.

HOW IT WORKS

We use both YoloV8-detect model and YoloV8-pose model to analyse pictures.
The first one counts every people, animals and equipment that are in the picture.
The second predicts the pose of people. Then we made a code to interpret those data to know in which direction they are going (mainly to know if they go left or right on a certain path).

Pose

Detect

https://github.com/Attendance-PNE-OFB

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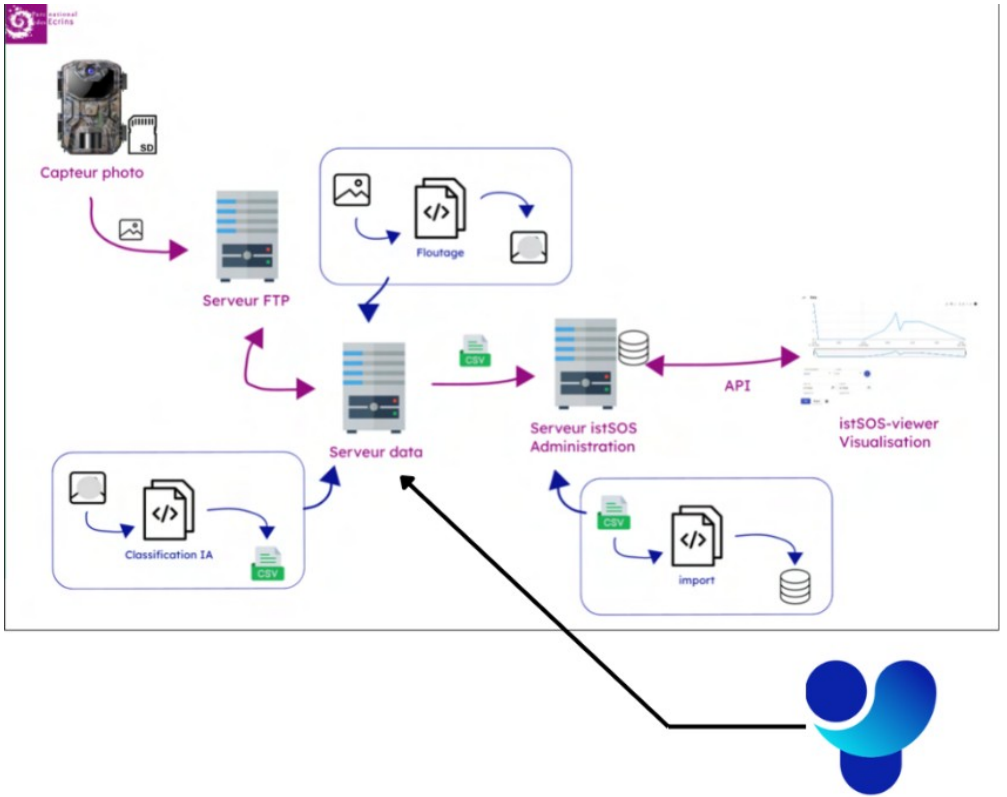

FTP

- Téléchargement des images du FTP
- Extraction des métadonnées
- Classification
- Floutage de l'image (optionnel)
- Suppression de l'image
- Traitement des données
  - Regroupement (10s)
  - Arrondissement (date)

Floutage

https://github.com/Attendance-PNE-OFB

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Zoom sur les données de fréquentation sentiers
Zoom sui dati relativi alla frequentazione dei sentieri

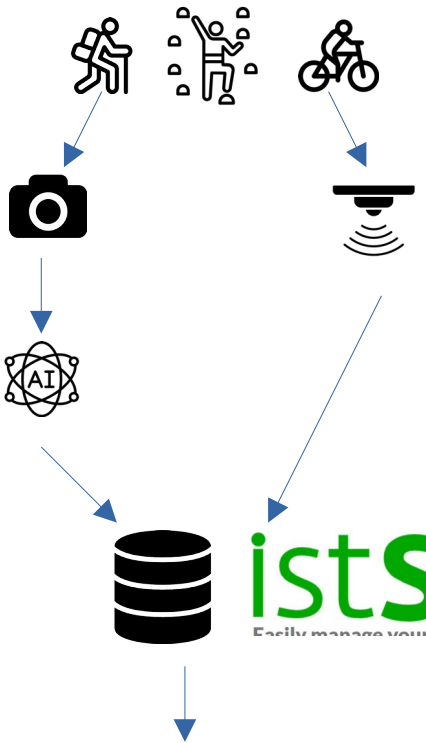
Activités
Attività

Capteurs
Sensori

Traitements
Trattamenti

Stockage
Stoccaggio

Diffusion
Diffusione



LoRaWAN®

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Novembre 2025 – Hackathon Outdoor & biodiversité
Novembre 2025 – Hackathon Outdoor & biodiversità

https://www.ecrins-parcnational.fr/actualite/hackathon-outdoor-data-lab

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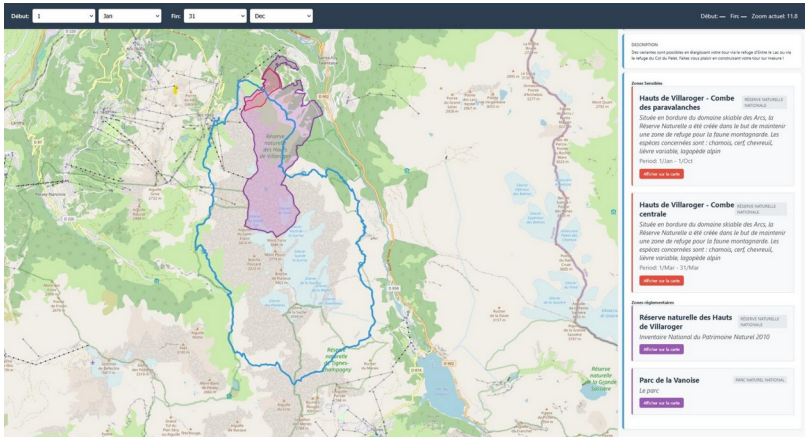

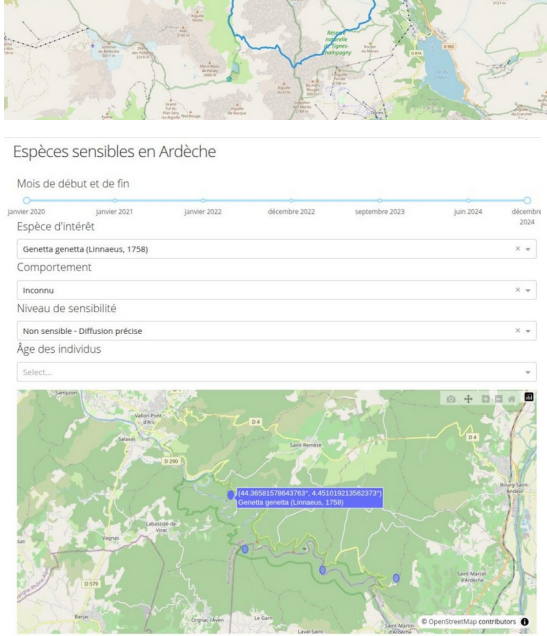

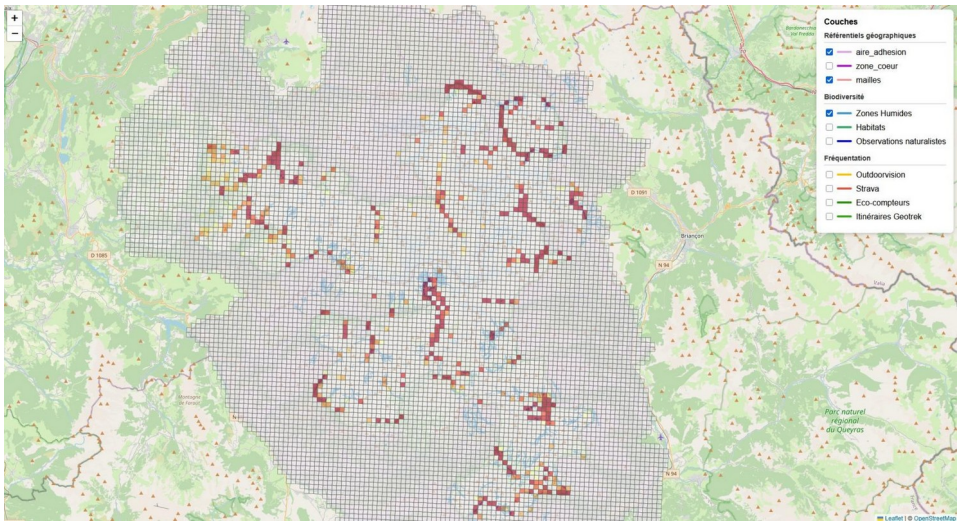

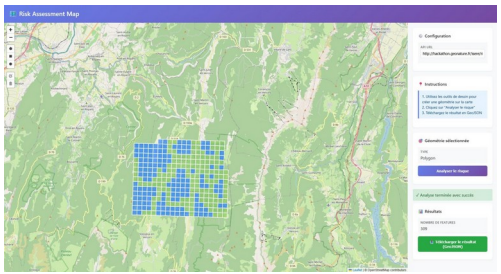

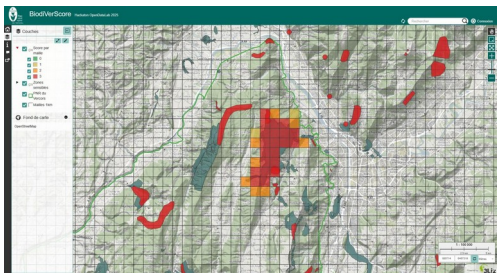

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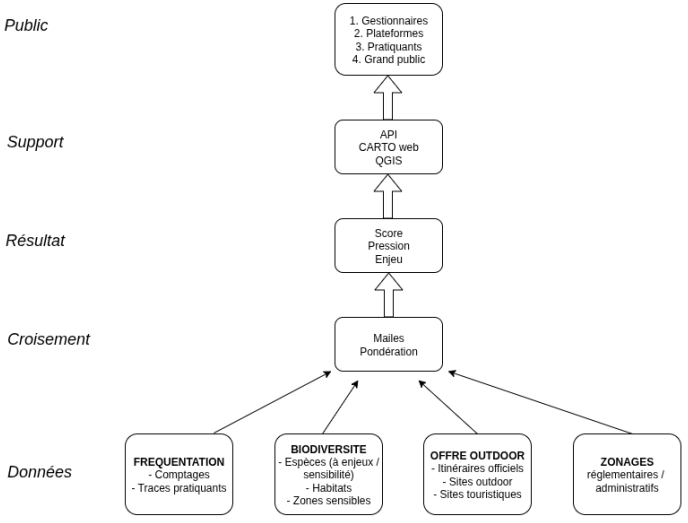

➡️ **Outil opensource, agrégateur, générique, intéropérable, multi-sources et multi-échelles**

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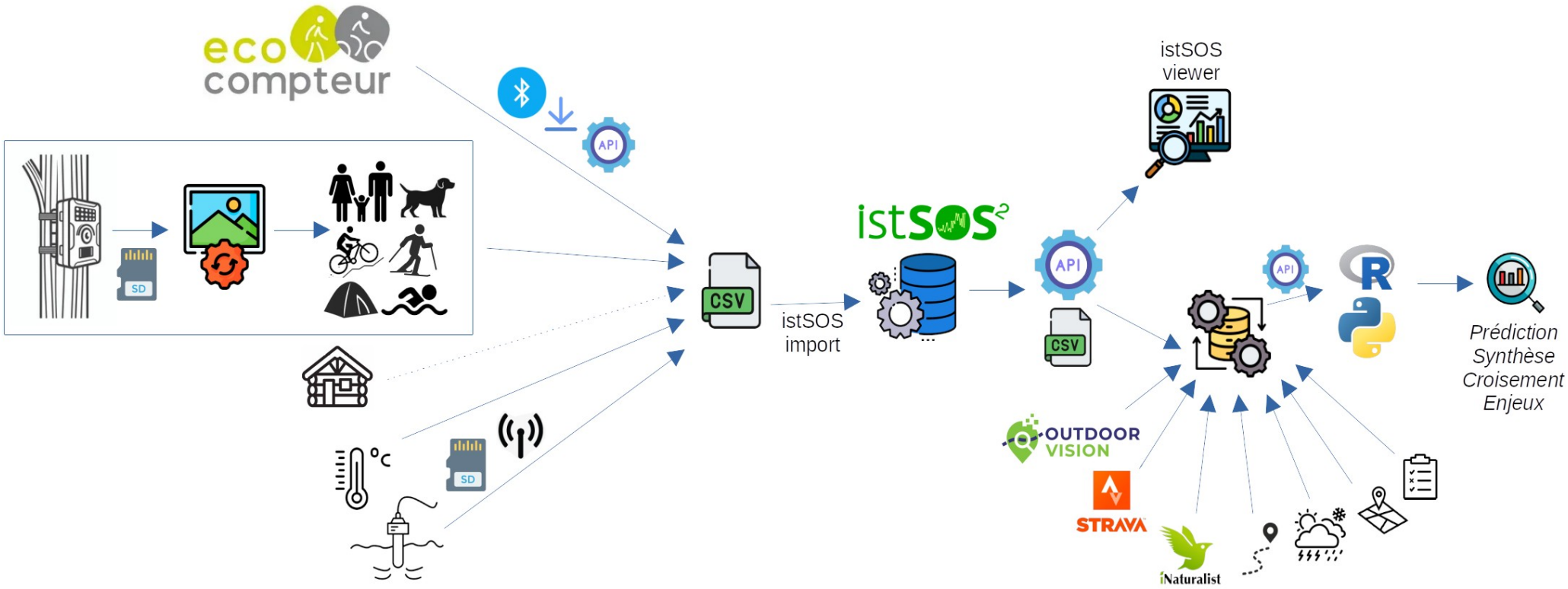

Parc national des Ecrins

Merci pour votre attention !
Grazie per l'attenzione

camille.monchicourt@ecrins-parcnational.fr