

Dynamic environmental monitoring and results presentation on a Power BI dashboard

INTERSOL - LYON – 21st JUNE 2022

Session A: Digital soil monitoring and management

RAMBOLL

Bright ideas.
Sustainable change.



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4. Capabilities
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Context

- Great amounts of field and analytical data collected and documented digitally – **Could be further exploited**
- Decontamination works or site monitoring **spanning over several years**
- Repetitive weekly or monthly reporting tasks
- **A growing demand for easier access to the data** → Clients managing several sites

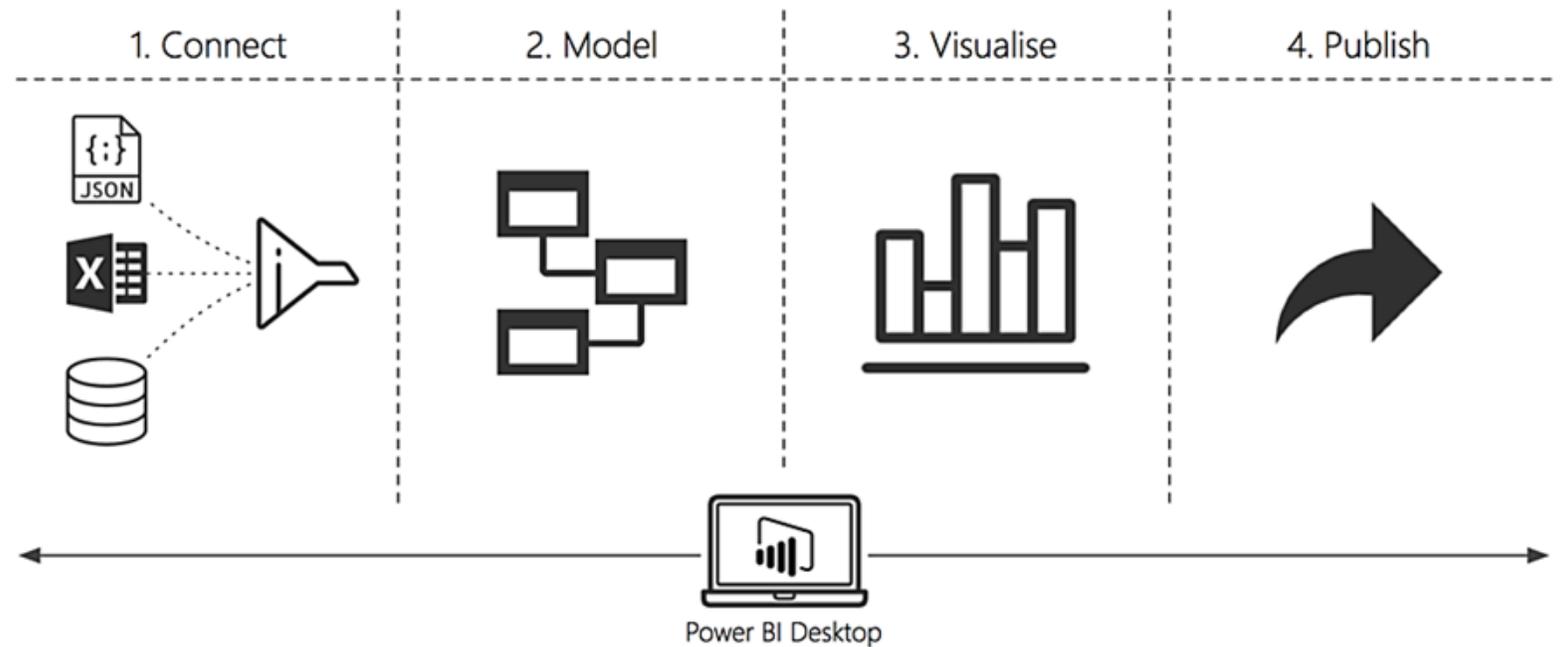


- Several tools to connect, analyze and visualize data
- A cloud platform for convenient sharing of reports and dashboards

It includes :

- A query system to connect to various data sources
- A modeling engine for creating data relationships and setting up interactions
- DAX : Calculation language – advanced version of Excel's
- Many default visualization – highly customizable

What is Microsoft Power BI ?



Capabilities



Mapping

The screenshot displays a web mapping application interface. On the left, there is a sidebar with two main sections: "WMS Area" and "site".

The "WMS Area" section contains four buttons: "BASIAS", "Inondation", "Znieff I", and "Znieff II". The "Znieff II" button is highlighted with a black background, indicating it is the active layer. Below these buttons are icons for a funnel, a square, and a list.

The "site" section contains a vertical list of 20 empty square checkboxes.

The main map area shows a satellite-style map of Western Europe, including France, the UK, and parts of Germany, Italy, and Spain. The map is overlaid with green and yellow areas, representing the "Znieff II" layer. Major cities like Paris, Lyon, Toulouse, and Bordeaux are labeled. The Bay of Biscay is labeled "Golfe de Gascogne / Golfo de Vizcaya".

At the bottom of the map, there is a navigation bar with a zoom-in (+) and zoom-out (-) button, and a copyright notice: "Leaflet | Icon Map | Map data © OpenStreetMap contributors, CC-BY-SA".

Results visualisation

← Carte des points de suivi

RAMBOLL

Aller au rapport →

Piézomètre	Eau superficielle
15	10
	Drain
	6

Point de suivi	Type de point	Dernier échantillonnage
Drain_1	Eau superficielle	
Drain_2	Eau superficielle	
Drain_3	Eau superficielle	
Drain_4	Eau superficielle	
Drain_5	Eau superficielle	
Drain_6	Eau superficielle	
Drain_7	Eau superficielle	
Drain_8	Eau superficielle	
Etang	Eau superficielle	avril 2022
Mare_M2	Eau superficielle	avril 2022
Pz1	Piézomètre	avril 2022
Pz10	Piézomètre	avril 2022
Pz11	Piézomètre	avril 2022
Pz12	Piézomètre	avril 2022
Pz13	Piézomètre	avril 2022
Pz14	Piézomètre	avril 2022
Pz15	Piézomètre	avril 2022
Pz16	Piézomètre	avril 2022
Pz17	Piézomètre	avril 2022

31
Nombre de points de suivi



Results visualisation

Suivi mensuel des paramètres

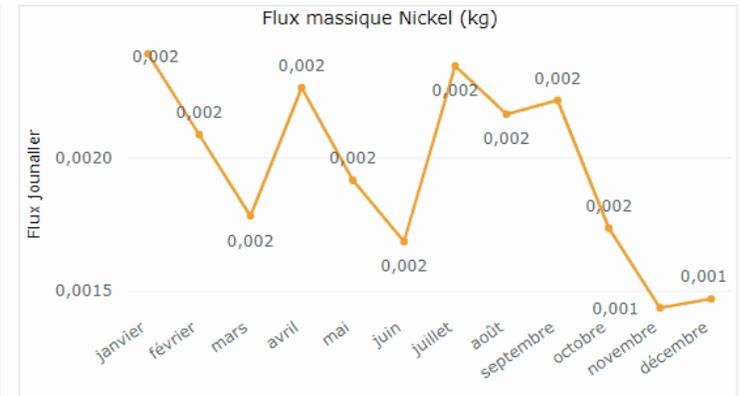
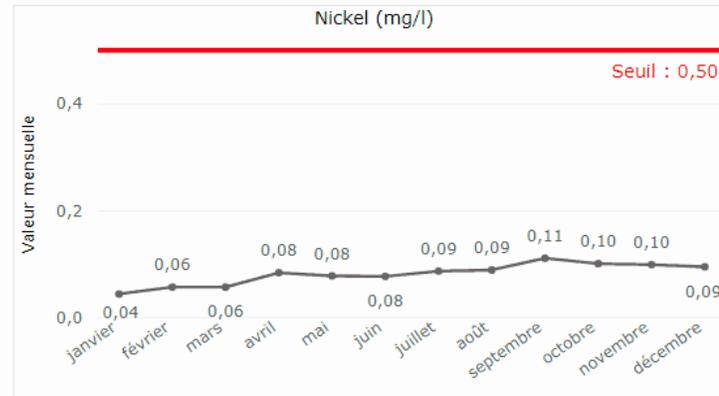
[Accueil](#)
[Aperçu global](#)
[Concentrations](#)
[Flux massique](#)
[Débit/Pluviométrie](#)
[2015](#)
[2016](#)
[2017](#)
[2018](#)
[2019](#)
[2020](#)

Valeur et flux Nickel (Seuil de conformité)

Sélection paramètre

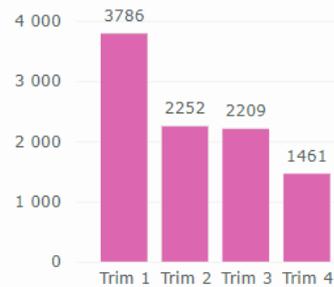
Al	DBO5	Mo	V
As	DCO	Ni	Zn
Cd	Fe	Pb	
Cr	Hg	pH	
Cu	MES	Temp	

Seuil : 0,5 mg/l

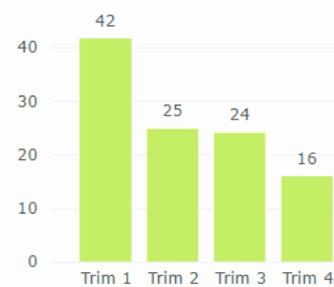


Précipitations et volumes

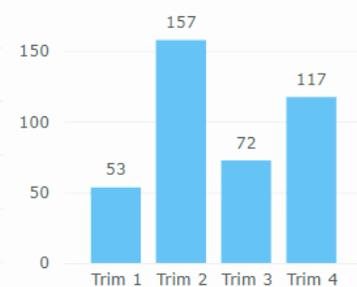
Volume total (m³)



Débit journalier moyen (m³/j)



Pluviométrie totale (mm)


[+ Détail](#)

Conformité/seuils

Nickel (Seuil de conformité)

Année	Nombre de dépassements
Total	0

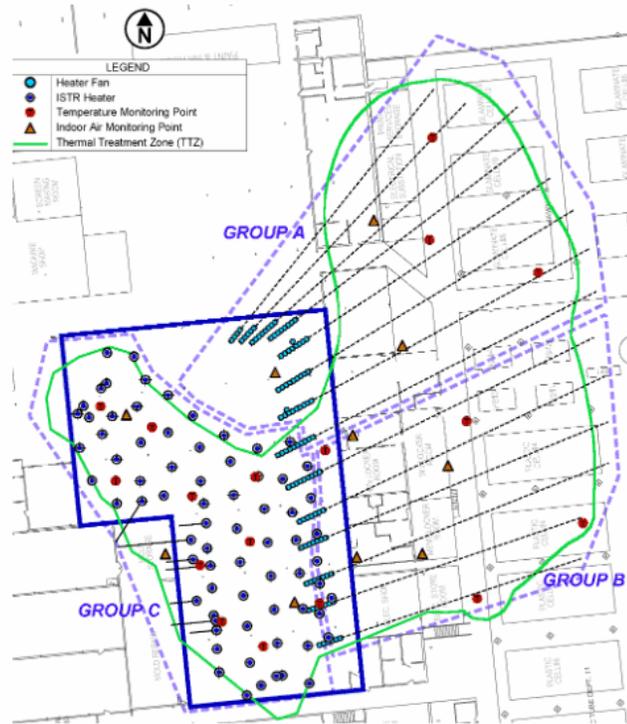
Taux de conformité global

Type	%
Dérogation 2025	
pH	0 %
As	0 %
Al	0 %

Results visualisation

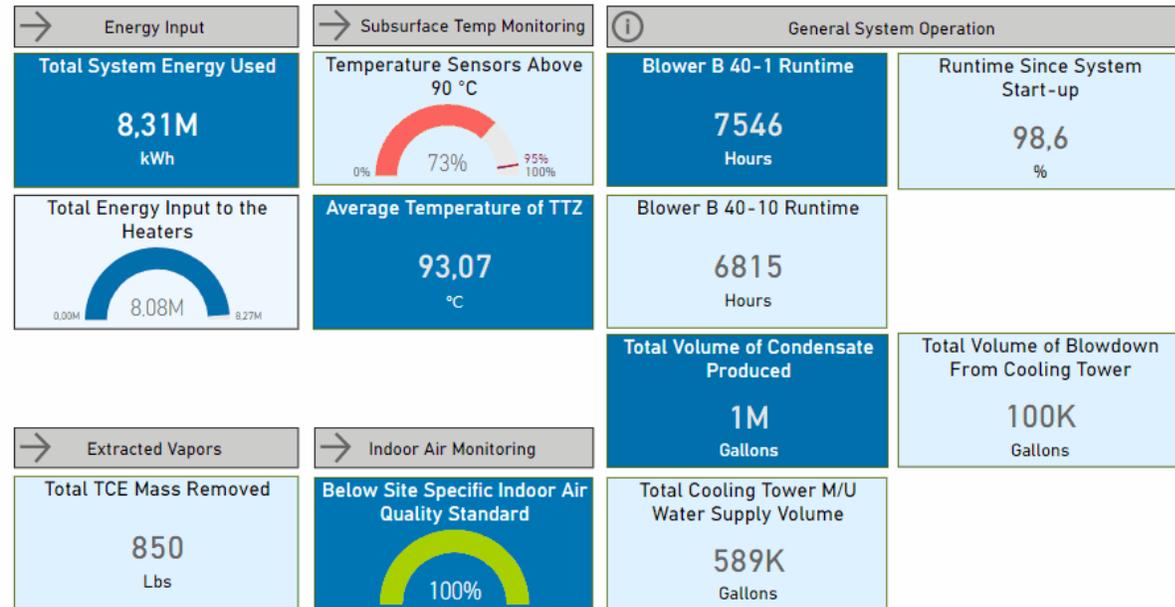


Site Layout



Data Last Refreshed: 2022-06-14 19:04:21

System Operation as of 6/13/2022



Notes:

- All total values are sum of data collected since the system operation began on July 29, 2021.
- Temperature sensors above 90°C represents % of sensors in Group B above 90°C when the last temperature readings were collected.
- Average Temperature of TTZ is the average of latest temperature readings collected at the temperature sensors within Group B.

Automated PDF report

COMPTE RENDU TRIMESTRIEL

- Bilan massique actualisé
- Evolution des concentrations en aval



Masse totale extraite depuis le démarrage des pompages :
Environ 12,79 tonnes de COHV totaux

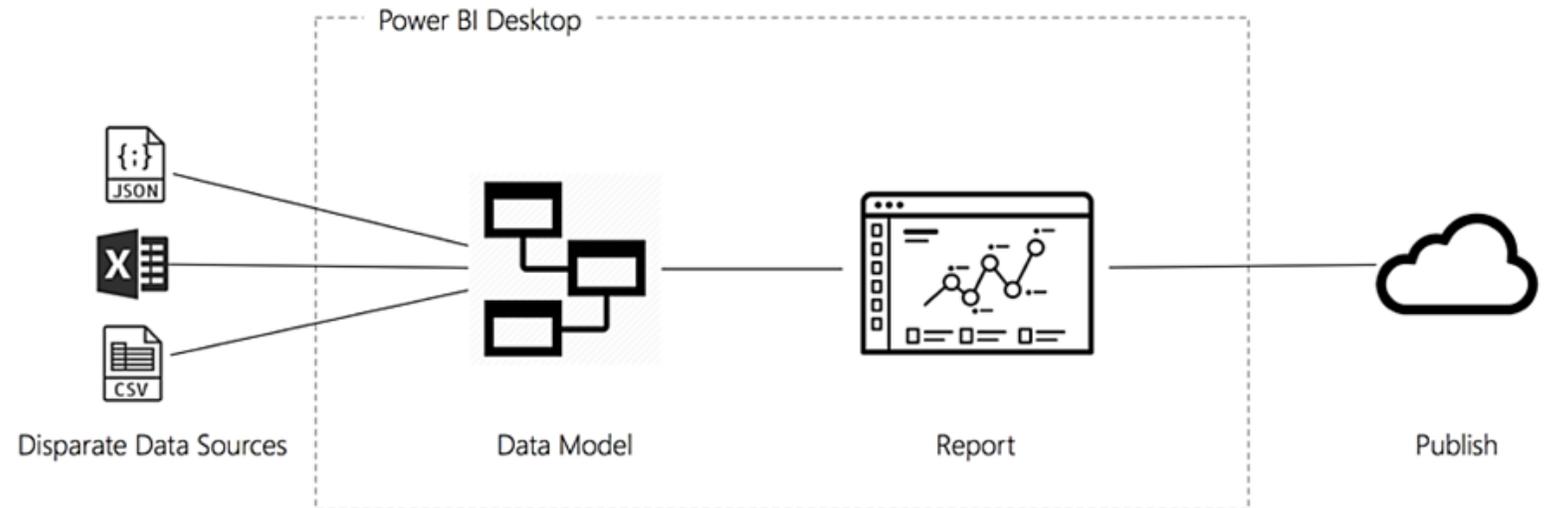
Données estimées (débits moyens approchés en fonction des périodes d'arrêt constatées masses extraites établies sur la base des concentrations ponctuellement relevées) au 22/06/2021 (dernière visite effectuée)

Masses extraites par année :

2017	3 493
2018	2 500
2019	2 642
2020	1 907
2021	2 247

Workflow

- Different data storing options
- Most of the data is documented digitally and uploaded to the EQuIS environmental database system
- Raw data files can be placed on a shared folder and will be appended automatically
- Scheduled daily refresh – Project stakeholders have access to the latest data



Lessons learned

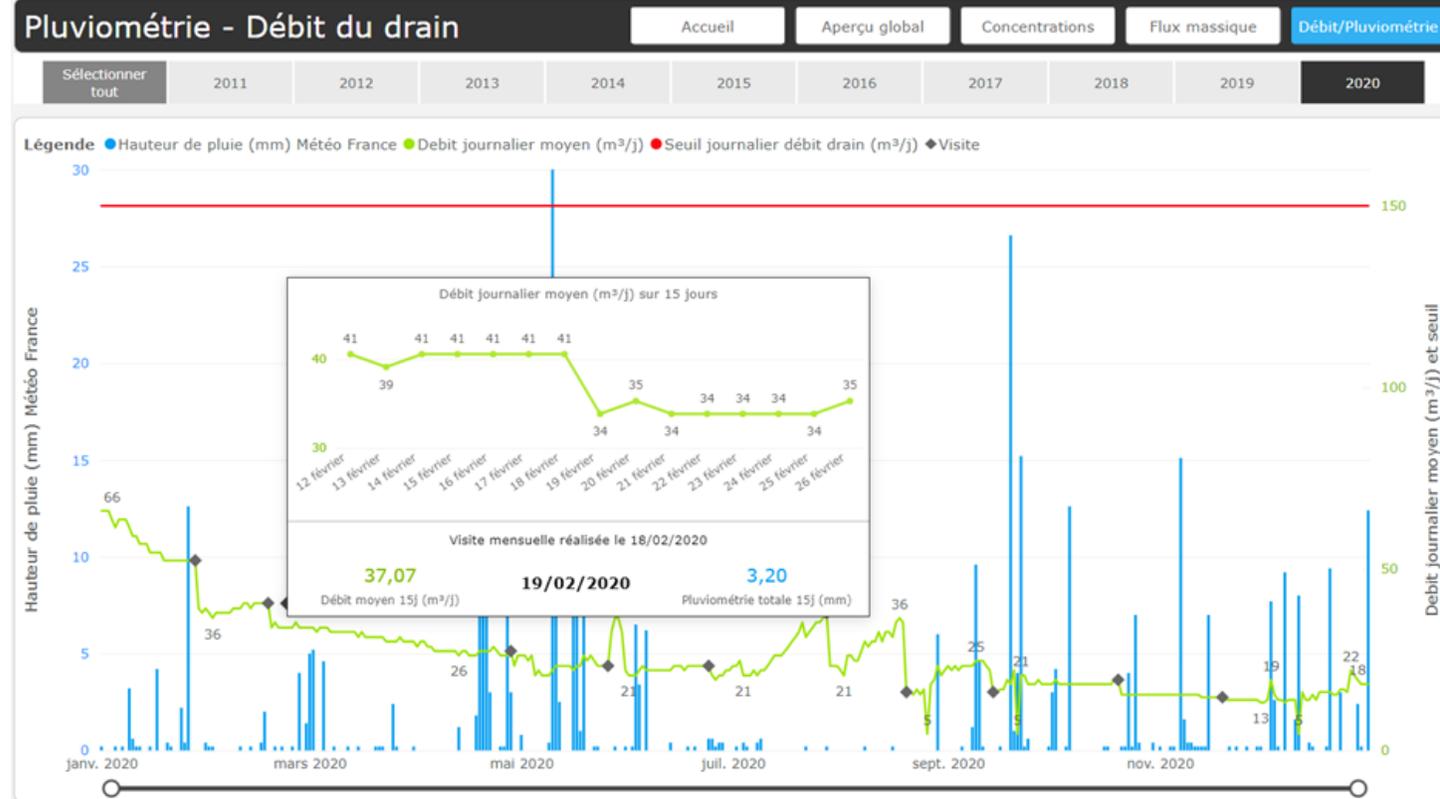


Challenges

- Clean data is essential
- Easy hands-on but steep learning curve
- Reports can quickly become complex and difficult to understand for external users
- Compatibility issues between tools → Maintenance
- Strong knowledge base → Lots of learning and support material

```
5 VAR cas_rn = resultat_analytiques[cas_rn]
4 RETURN
5 CALCULATE (
6     SUM ( [masse_intervalle] ),
7     FILTER (
8         ALLEXCEPT (
9             resultat_analytiques,
10            resultat_analytiques[sys_loc_code],
11            resultat_analytiques[cas_rn]
12        ),
13        (
14            resultat_analytiques[sys_loc_code] = sys_loc_code
15            && resultat_analytiques[cas_rn] = cas_rn
16            && resultat_analytiques[index_t] <= EARLIER ( [index_t] )

```





Key takeaways

- Digging into the data at several levels
- Dual purpose : Client reporting and internal project management
- Growing client demand for digital reporting
- Cost effective at enterprise scale
- Integrated solution → Easy to set-up, user control and security
- Frequent updates adding functionalities and data connectors

Thank you!

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