

10 juin 2016

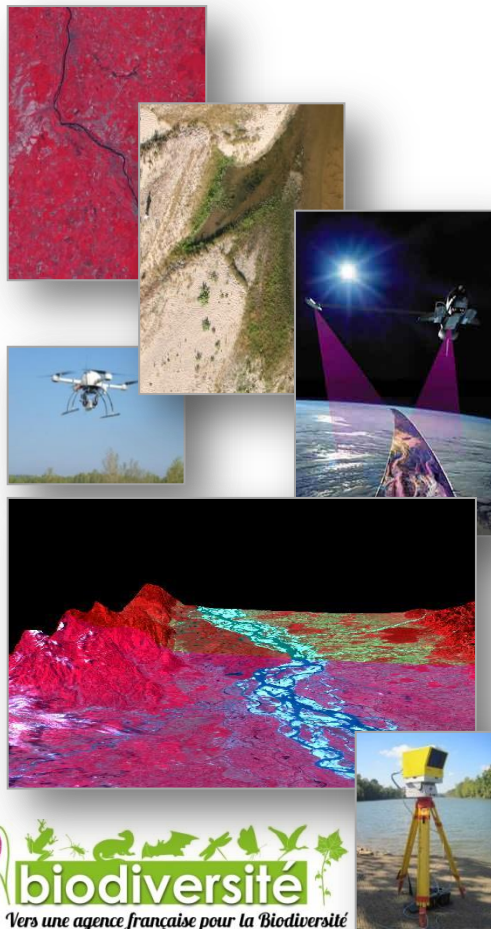
*Journée Technique*

*Avancées, apports et perspectives de la télédétection  
pour la caractérisation physique des corridors fluviaux*

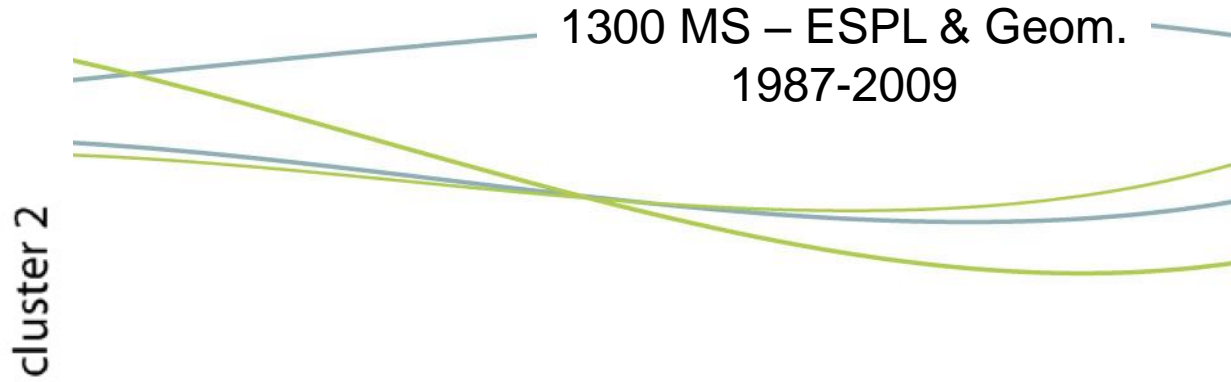
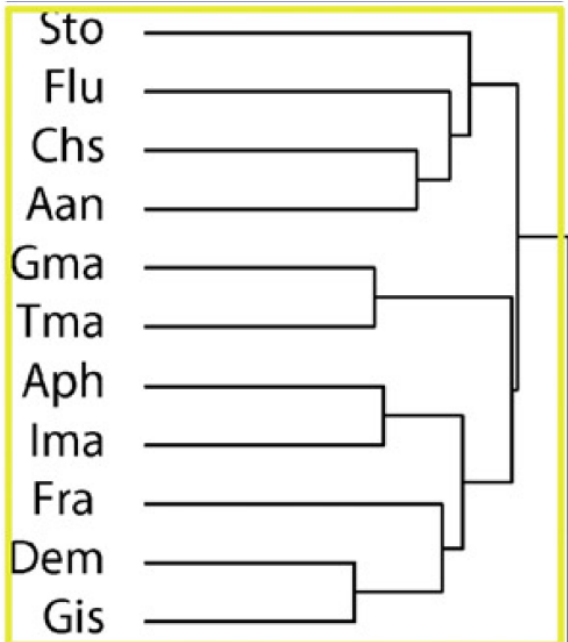
# Avancées récentes et perspectives R&D

Piégay H.

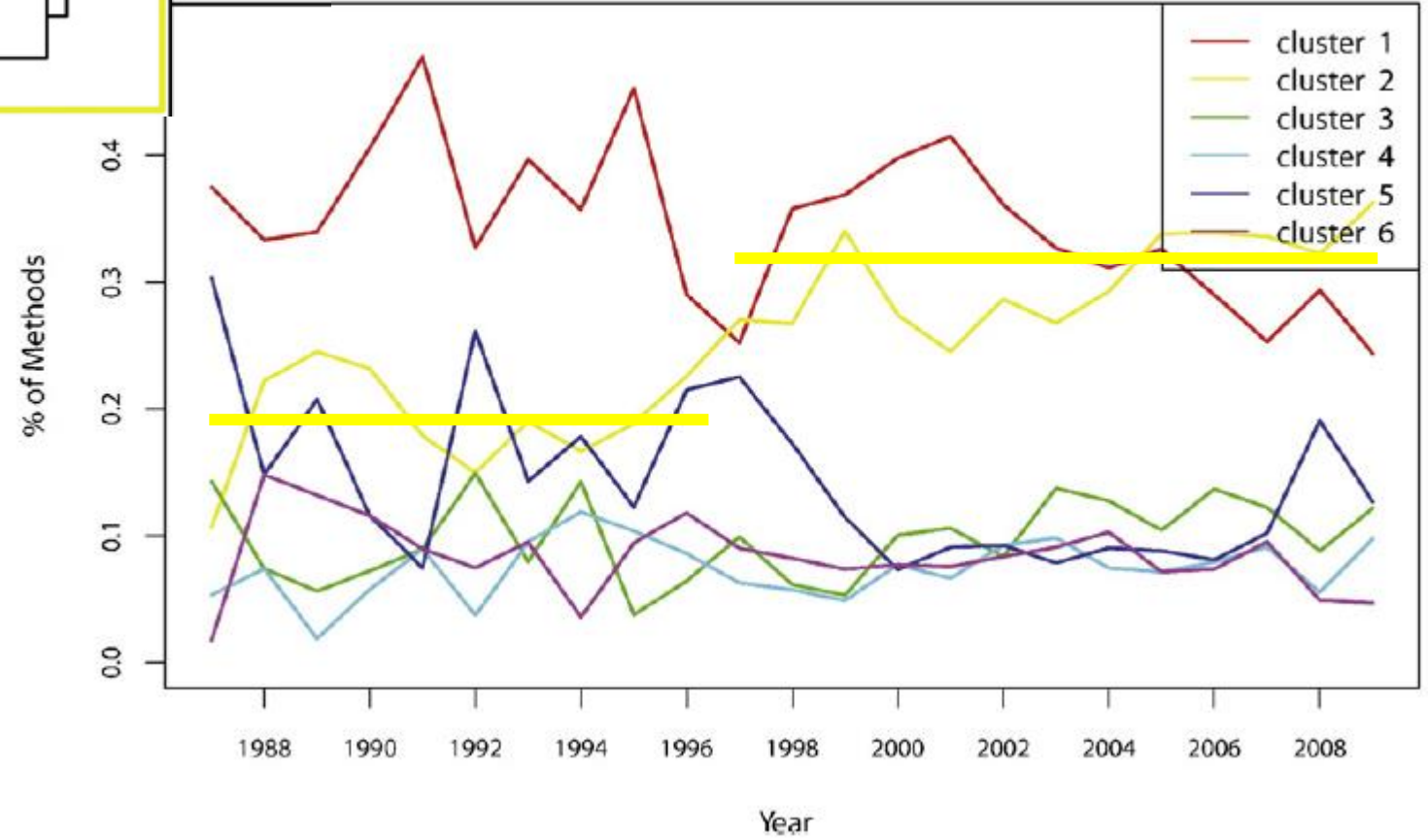
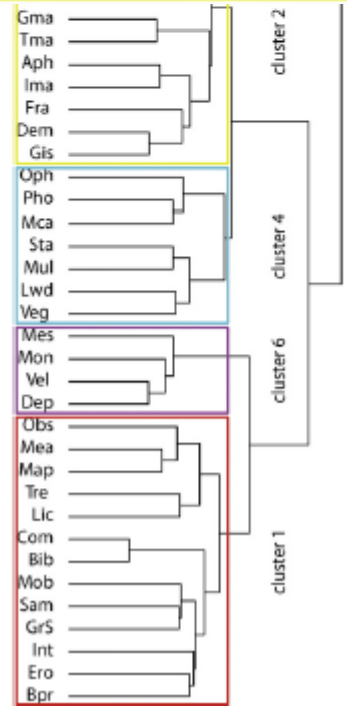
Univ. de Lyon, CNRS UMR 5600, ENS de Lyon, France







*H. Piégay et al. / Geomorphology 248 (2015) 489–500*



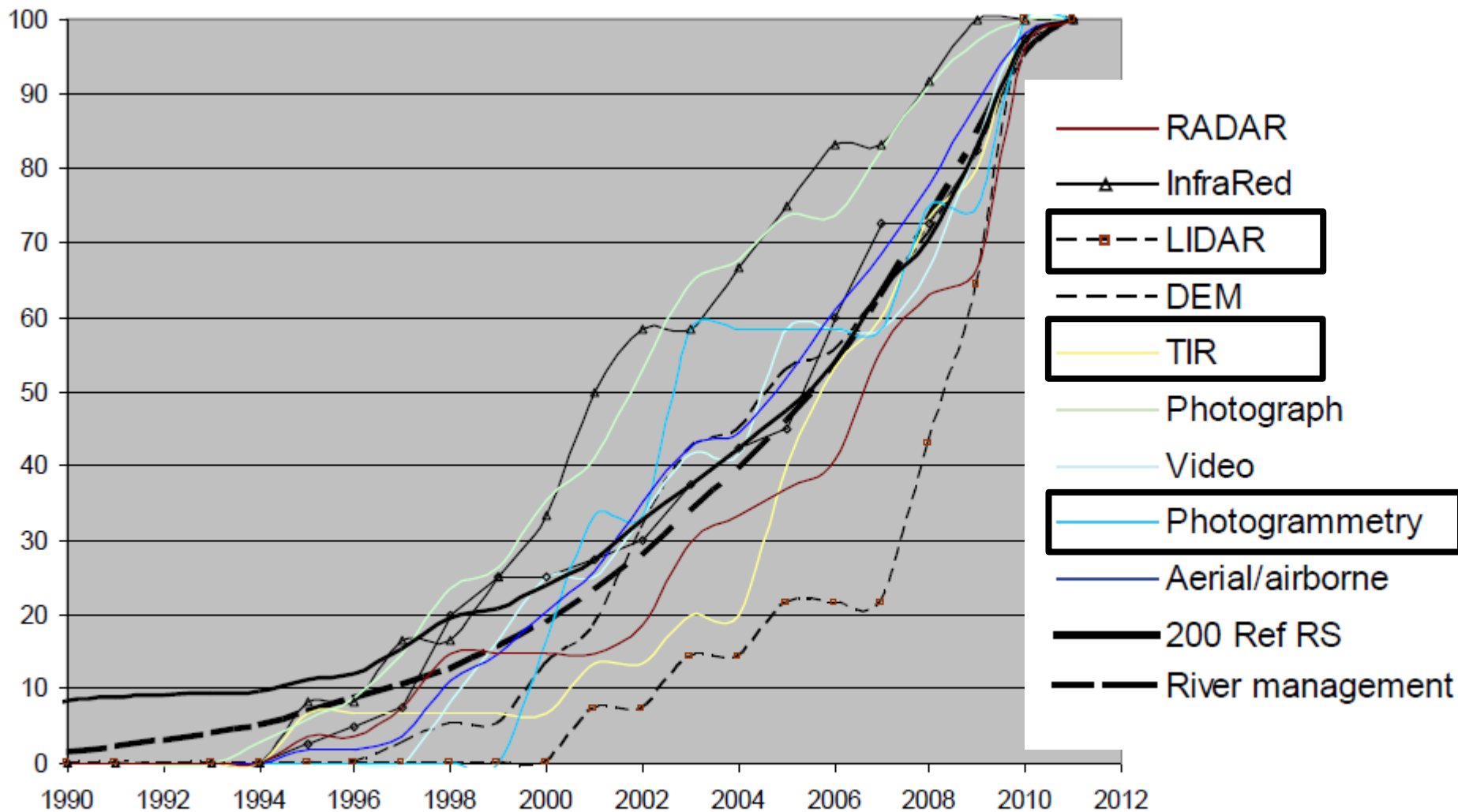
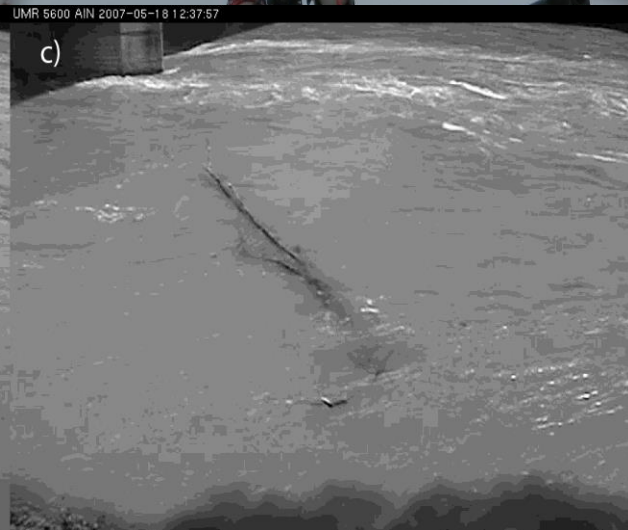
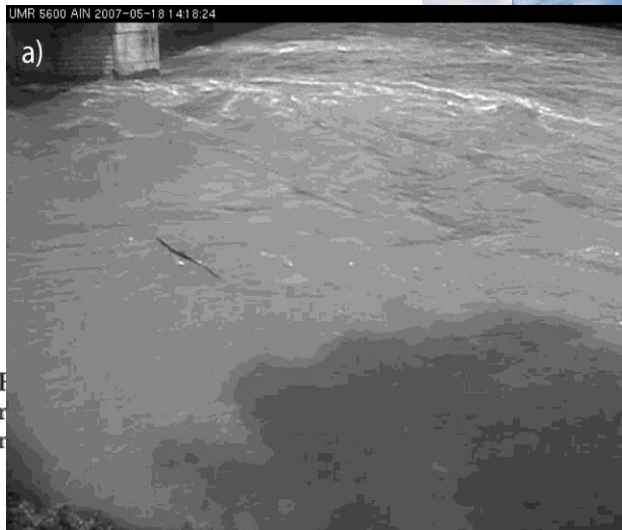
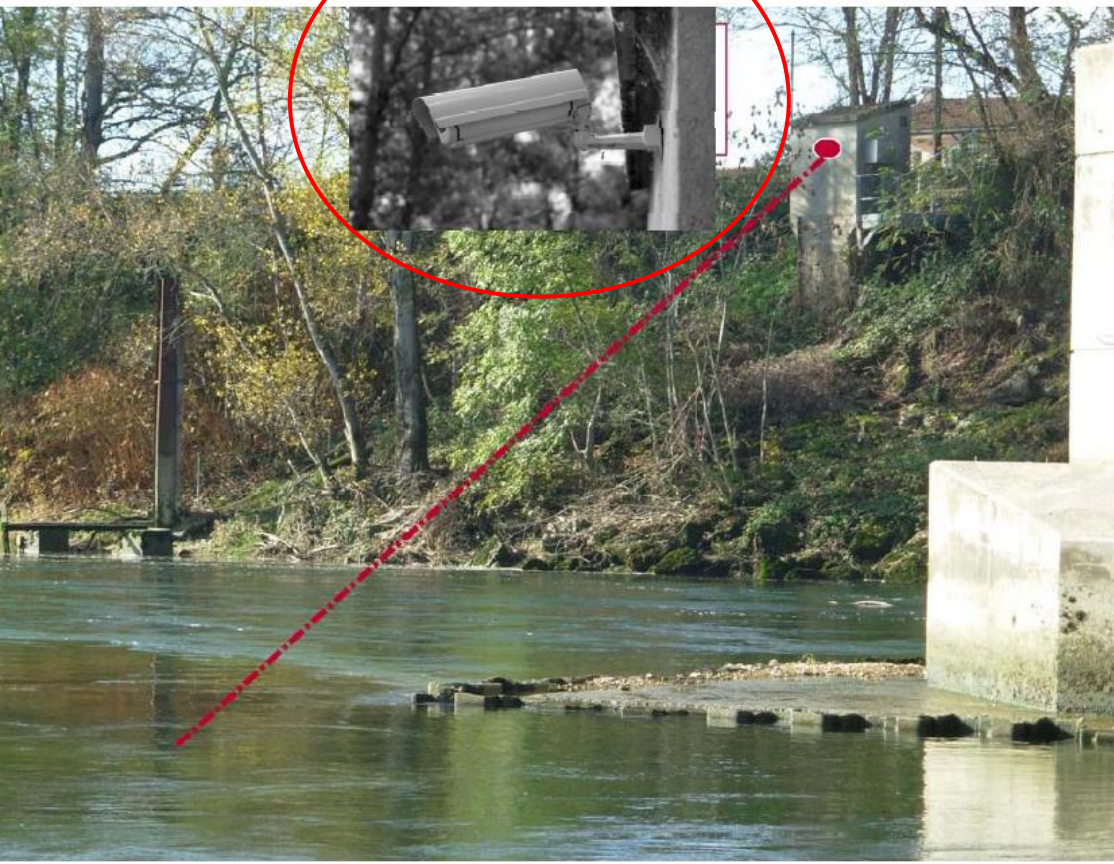
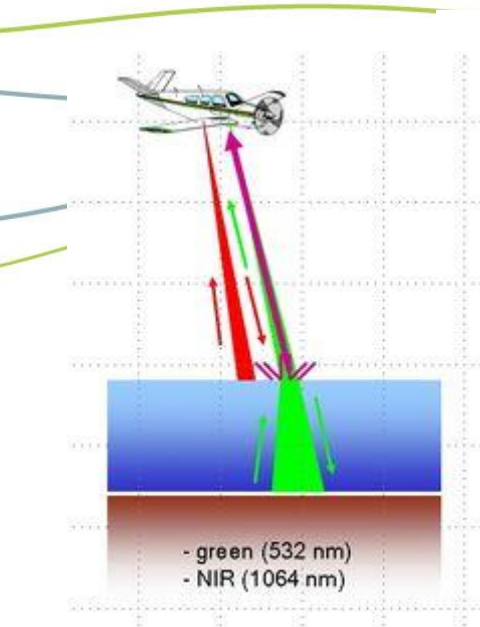


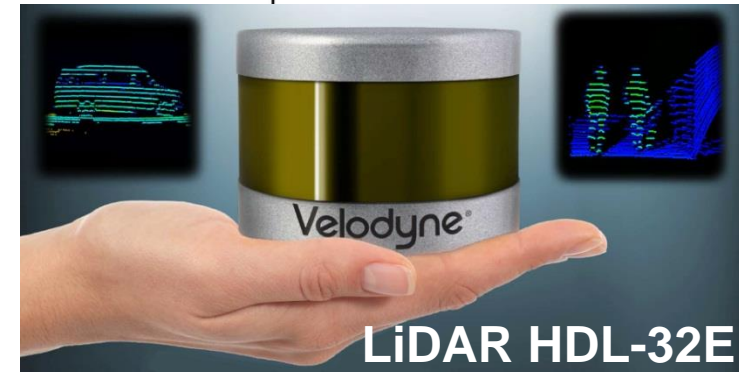
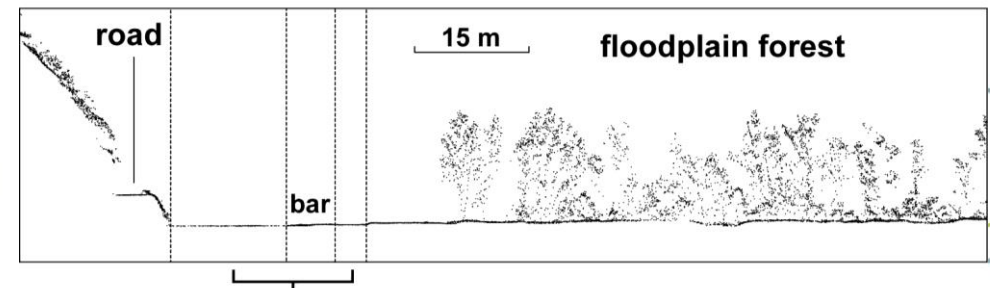
Figure 5 – Cumulative frequency curve (in% of papers) of each of platforms/sensors cited in the 200 papers of the WOS dealing with river and remote sensing.

eine évolution





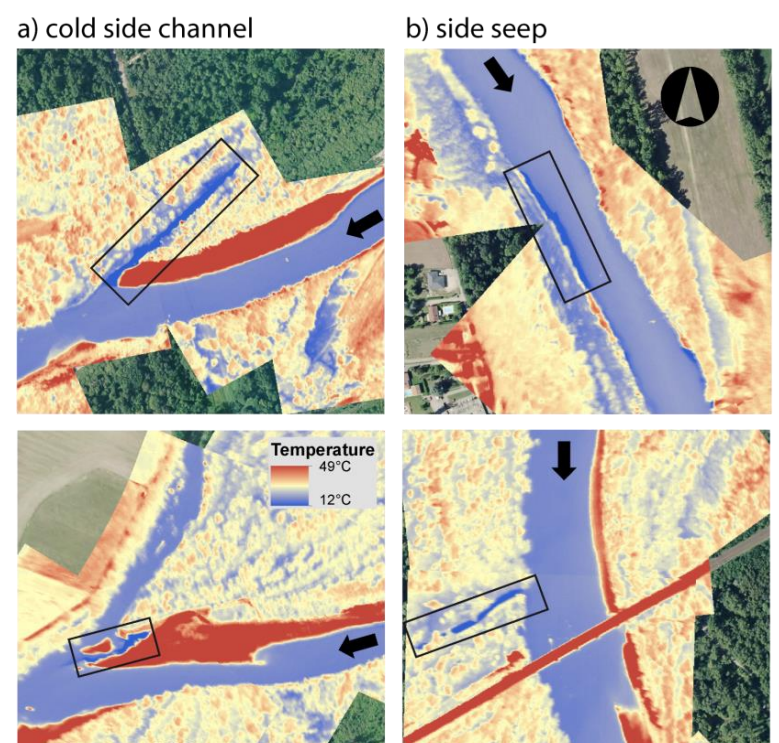
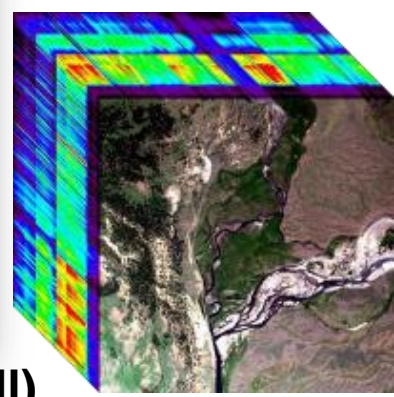
**VarioCAM®  
Infratec**

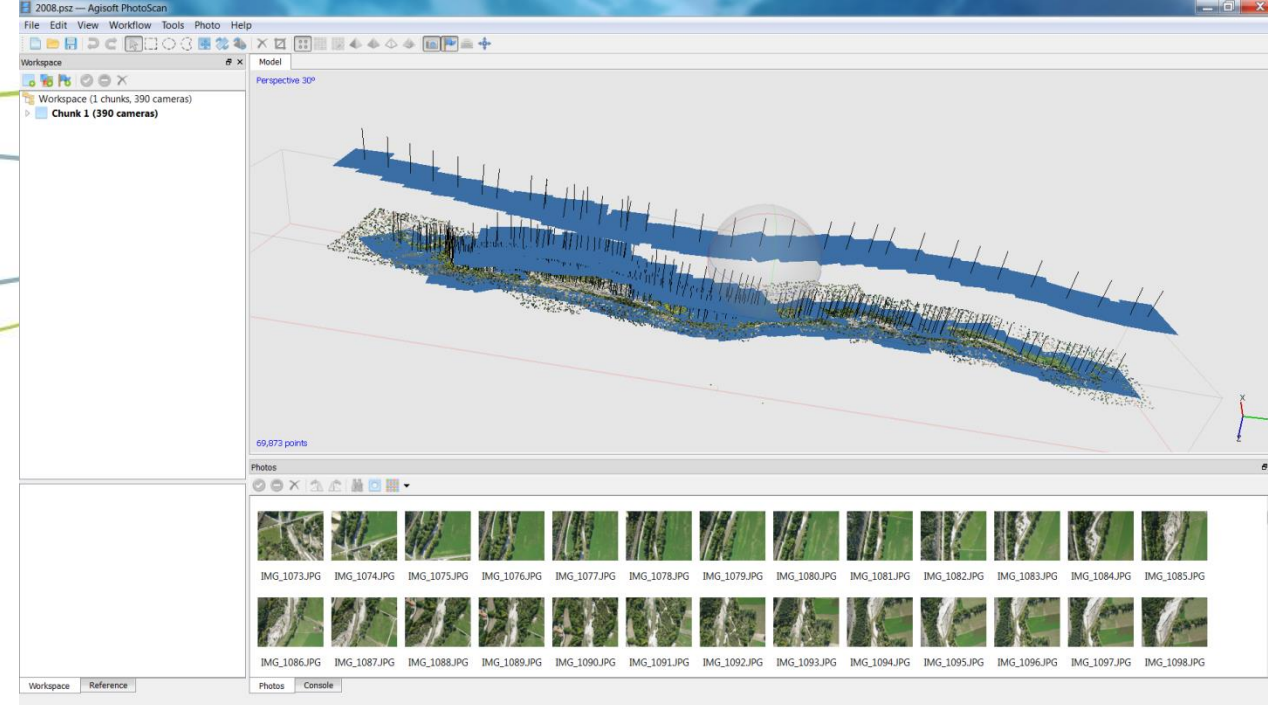


[http://wikhydro.developpement-durable.gouv.fr/index.php/Utilisation\\_du\\_lidar\\_pour\\_la\\_cartographie\\_des\\_habitats\\_c%C3%B4tiers](http://wikhydro.developpement-durable.gouv.fr/index.php/Utilisation_du_lidar_pour_la_cartographie_des_habitats_c%C3%B4tiers)



**Nano-Hyperspec (Hadwall)**

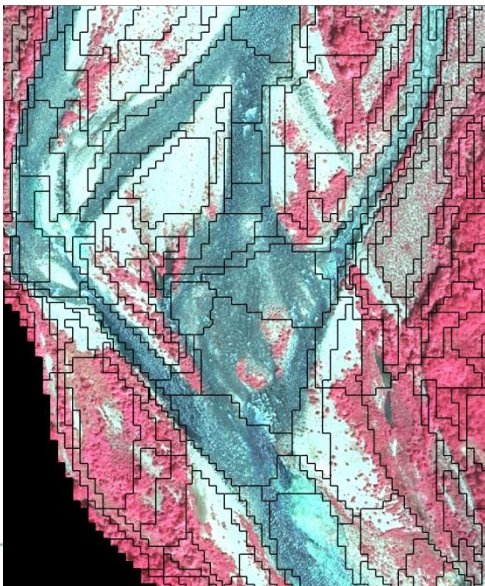




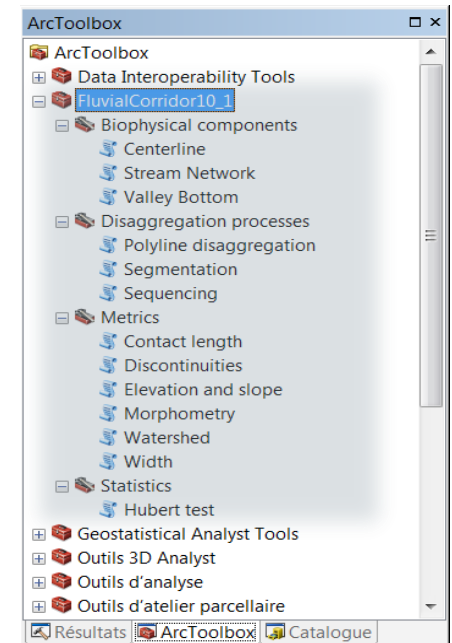
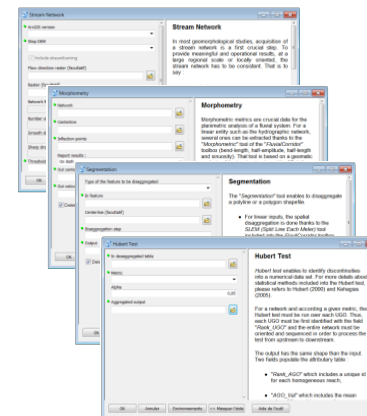
Agisoft Photoscan

SFM

*FluvialCorridor*,  
a GIS toolbox package



Orienté-objet



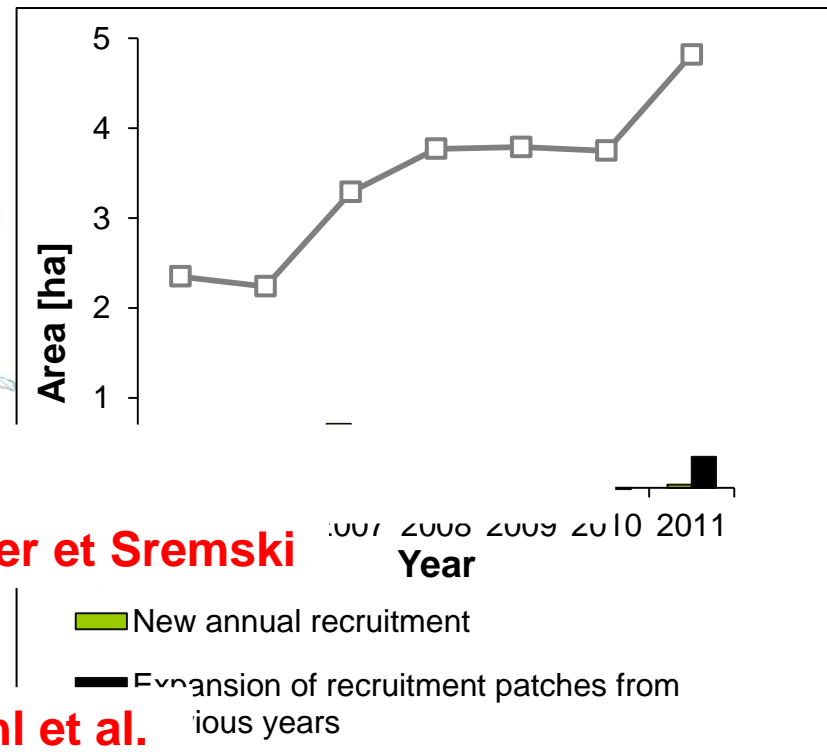
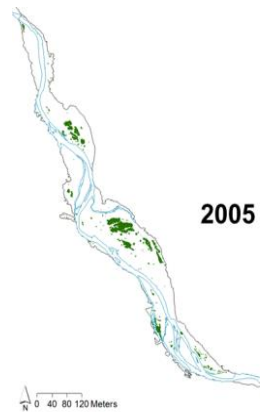
Roux et al., 2015

# Intérêt opérationnel

- Appui aux politiques de l'eau
- Caractérisation des corridors fluviaux
- Apport LiDAR
- Applications opérationnelles

## • Monitoring local / Réponse du système à une intervention (<1km)

- Drone / LiDAR
- Acqu. terrestre



**Dynamique torrentielle – Aubaud et al.**

**Outil de suivi par photogram. - Le Chevillier et Sremski**

**Drone/sédiments – Vàsquez-Tarrio et al.**

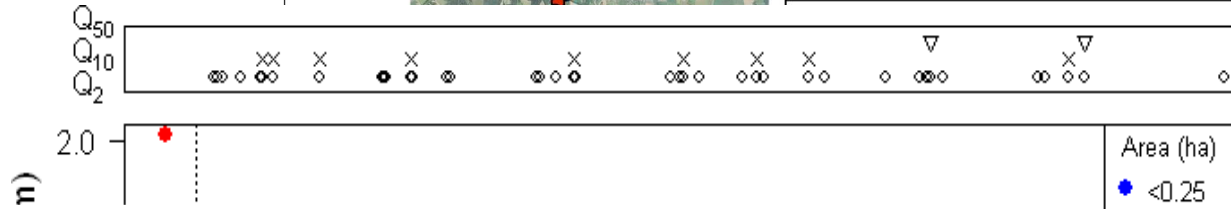
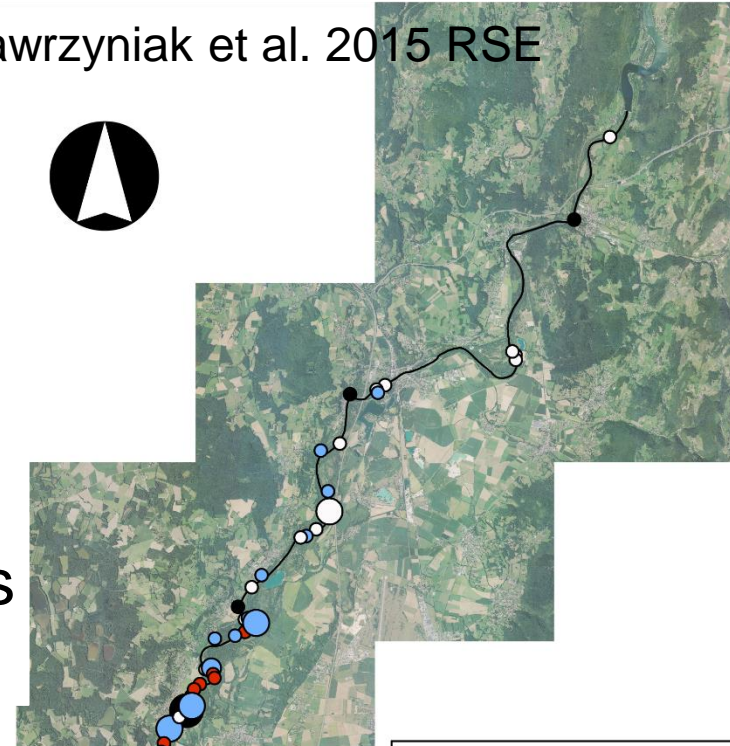
**Imagerie terrestre / annexe fluviale – Koehl et al.**



# Intérêt opérationnel

- Diagnostics hydro-morphologiques (>10 km)
  - Caractérisation (multi-capteurs embarqués)
  - Archives

Wawrzyniak et al. 2015 RSE

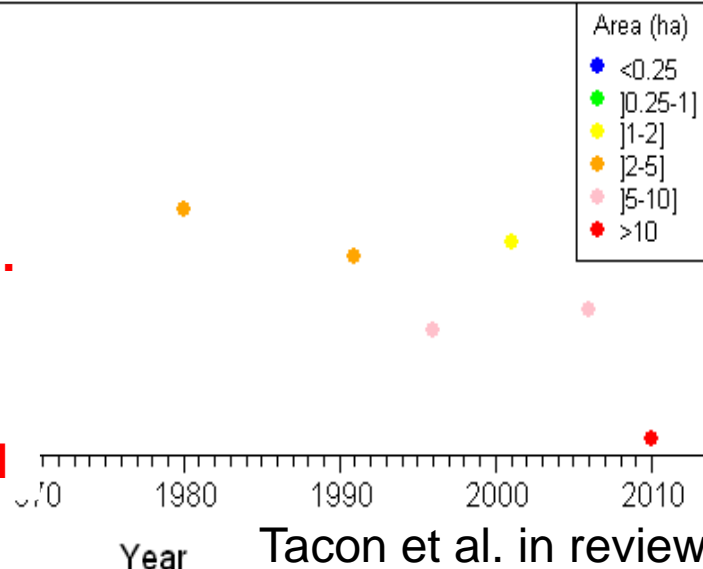


**Durée d'inondation / radar – Cécile Cazals et al.**

**LiDAR aéroporté topo-bathy – Dimitri Lague et al.**

**Barrage/méso-habitats – Marie Spitoni et al.**

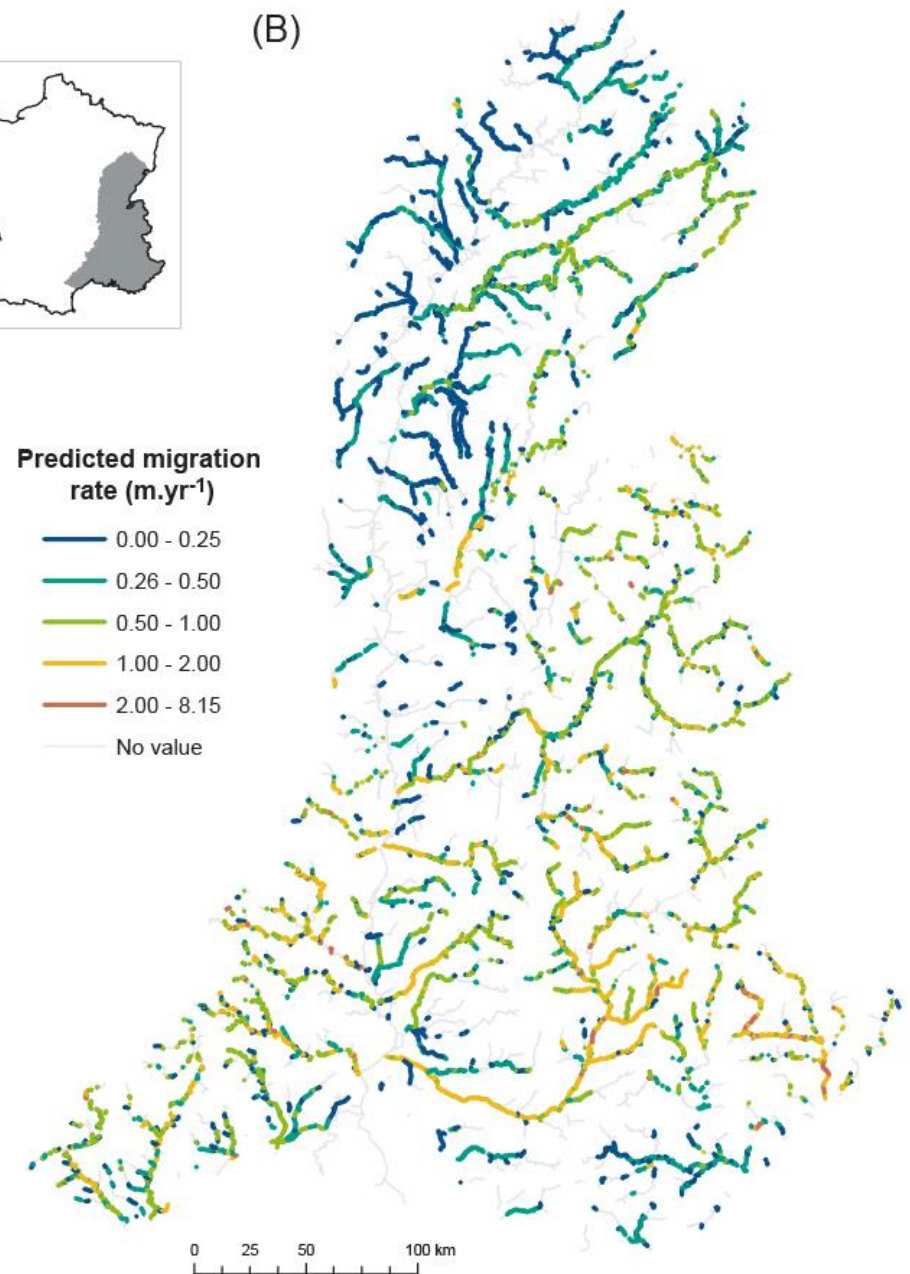
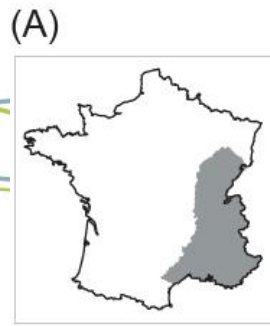
**LiDAR / Délimitation des Zhu – Sébastien Rapinel**



Tacon et al. in review

# Intérêt opérationnel

- **Planification / Régionalisation (>100 km)**
  - Produire la donnée (LiDAR, données d'archives)
  - et les indicateurs



**CarHyCE / LiDAR – Thommeret et al.**

**Ripisylve – Tormos & Van Looy**

**Données / Indicateurs régionalisés –  
Michez et al., Demarchi et al.**

# Intérêt opérationnel

- **Multi-échelle**

- Plateformes web
- Outils de géotraitement
- Dynamique participative

The screenshot displays the OHM Vallée du Rhône web application. The browser window shows the URL `mapmint.univ-st-etienne.fr/public/OHM-VR`. The application header includes the logo for EVS (Ecole Val de Saône) and the title "OHM Vallée du Rhône". A search bar is present with the text "RECHERCHER" and a dropdown menu set to "Communes". The main interface features a navigation menu with options like "Accueil", "DZM\_Diachronie", "Nouvelle carte", and "Créer une présentation". A toolbar contains icons for "Détails", zooming, and other map functions. A search box prompts the user to "Rechercher une adresse ou un lieu". The central map shows a topographic view of the Donzère-Mondragon area, with a river and various land use layers overlaid. A legend on the left side of the map lists several categories:

- Risques environnementaux
- Restauration et renaturation
- Nouveaux outils
- Emprise ponctuelle
  - Trajectoire géo-historique
  - Fonctionnement social
  - Risques environnementaux
  - Restauration et renaturation
  - Nouveaux outils
- Repères
  - Zones urbaines
  - Chenal du Rhône

On the right side, a "Contenu" panel shows the following layers:

- OccSol DZM
- Occupation du Sol Donzère-Mondragon
  - Surface en eau
  - Banc de galets
  - Lône
  - Affluent
  - Masse d'eau artificialisée
  - Forêt alluviale
  - Agriculture
  - Aire d'activités
- Topographie

The map itself shows a river flowing through a valley, with various land use patterns and infrastructure like roads (D4, D8, D994, D901) and buildings (Bourg Saint-Andéol, Pierrelatte, Les Blaches, Lapalud, Pont Saint-Esprit, Mondragon) visible.

**SIEL – Dionis du Séjour**

**Raw Imagery**

**Raw Topography**

**Web-based Interface  
and FRS\* tools**

- Channel Geometry
- Bathymetry
- Substrate
- Water characters
- Flow Velocity
- Riparian vegetation
- etc...

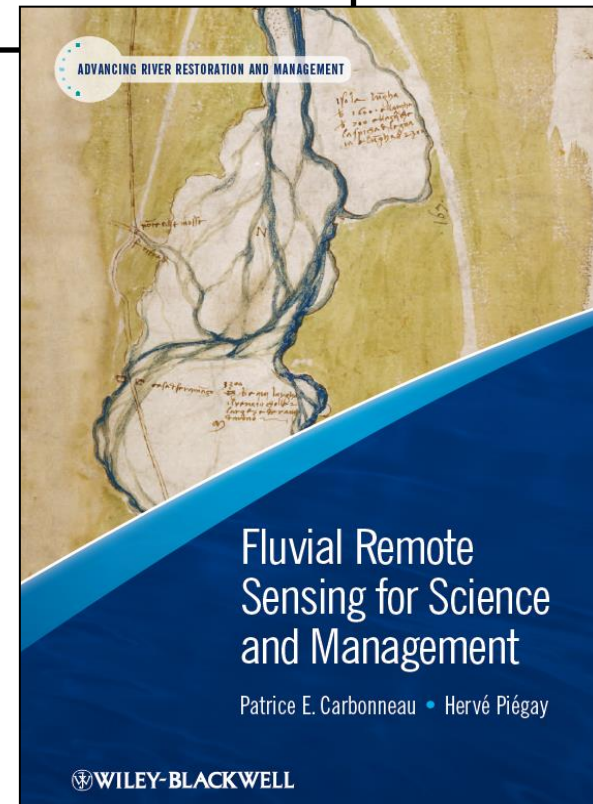
**External Data**

- Discharge
- Water/habitat characters
- Living communities
- etc..

Visualising  
Analysing  
Archiving  
Sharing

**Science and Decision Support**

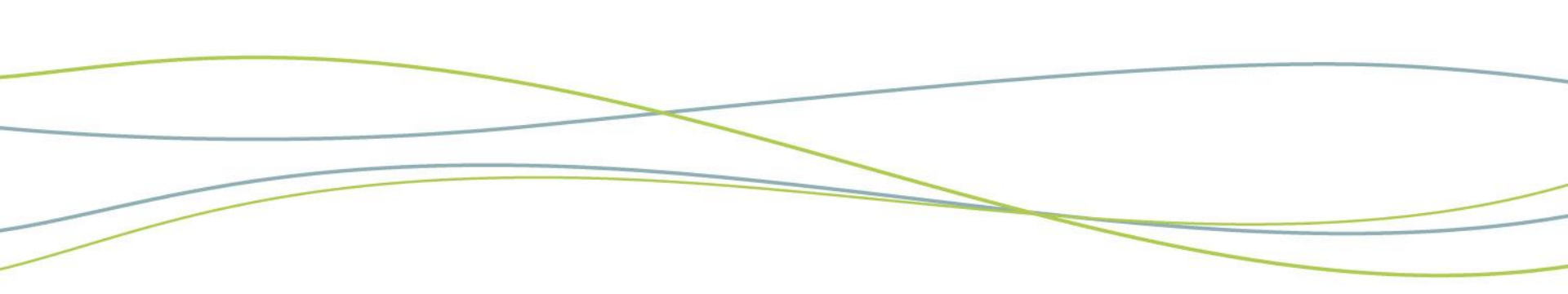
- Characterising river corridors
- Re-testing classic river science theories
- Planning and targeting Management efforts
- Monitoring river systems
- Predicting costs, sensitivity and evolution
- Early warning of hazards



\* FRS : Fluvial Remote Sensing

# Merci de votre attention et Bon séminaire



- 
- **Techniques et méthodologique (évaluer le potentiel de nouveaux vecteurs/capteurs)**
  - **Caractérisation des paysages fluviaux**
  - **Modélisation multi-échelle, simulation des transferts**
  - **Exploration de nouvelles sources / au terrain**
  - **Intégration dans les politiques de l'eau, suivi, diagnostic, prévision, prévention, planification, priorisation (co-construire)**
- 