



# SeBS Transversal Workshop

Geoff Sawyer: EARSC Strategic Advisor

**EARSC**

European Association  
of Remote Sensing  
Companies



# Transversal Findings

## Day 1: Session on Roads Management

# Roads Management

## How satellites can help?

- Measuring the risk of ground movement and consequent road construction / maintenance costs.
- Ground settlement after laying ballast or embankment construction
- Monitor risk of landslides due to rockfalls or to heavy rains.
- Detecting stress in bridges & tunnels.

## Where satellites are helping:

- In active use in: Italy (core case), Norway (core case), Portugal (for maintenance prioritization), Sweden (monitoring projects).
- Under assessment in Austria (assessment of the use for bridge monitoring), Czech republic, Germany, Poland, Romania.

## The Benefits of using Satellites:

- Reduced risk of increased costs through more effective surveying
- Reduced rework caused by unforeseen ground movement
- Improved legal and regulatory environment through diagnosis of movements
- Reduced social costs through avoided road closures.

# Roads Management

## Insights:

- Satellite InSAR measurements provide a unique tool for monitoring ground stability and detecting where there is a risk to roads or other infrastructure.
- Ground instability, which depends on the underlying geology, is a greater problem in some countries but all countries suffer to different degrees and hence it is widely applicable.
- InSAR provides the only method of surveying large areas for ground movement; e.g. moraines in Norway, or tunnels in Italy.
- Agencies dealing with roads are generally public and the organisation structure can be a barrier to implementation.
- Successful introductions have involved a champion and have set backs when the champion was no longer in the post.
- An outside trusted agent was present in the Norway space office and the Geological Institute which initiated the programme. The presence of an industrial company able to support and demonstrate the practicalities was important to the adoption in Italy.

# Transversal Findings

## Day 1: Session on Forests Management

# Forest Management

## How satellites can help?

- Monitoring of clear cuts for adherence to permits.
- Detection of diseases
- Mapping of access into the forests
- Monitoring of fire damage.
- Replanting and sustainable development.

## Where satellites are helping:

- In active use in: Sweden (core case), Portugal (core case), global tropical forests for ESG.
- Under assessment in Austria, Cyprus, France, Germany, Norway, Poland, Romania, Spain, mostly for disease detection and burnt area mapping.

## The Benefits of using Satellites:

- Reduced costs of implementation of regulations
- Increased timber volume and reserves
- Improved forest ecosystem and biodiversity
- Better protection against threat of fire and emergency management
- Improved leisure facility for citizens

# Forest Management

## Insights:

- There is wide-awareness of the possible use of satellite data and uptake depends on the local forest conditions and legislation. In Sweden clearcut notification is set at 0,5ha whilst in some countries eg Czech Republic the limit size is smaller so making Sentinel use unattractive whilst commercial data may be too costly.
- Responsibility is devolved to local/regional administrations in many countries whereas the capability must be championed and introduced by a central (national) agency which becomes the trusted agent.
- Knowledge of the forests is important meaning that the service is often in-sourced through an administrative, remote-sensing or GIS department.
- The introduction of much more timely data (in Sweden) has made the monitoring product more attractive for other users and the use has increased in both public and private organisations.
- No platforms exist for the exchange of best practices but would be of interest to practitioners (in Sweden) particularly for knowledge of different processing techniques and data use (for example Sentinel 1 radar data).

# Transversal Findings

## Day 1: Session on Water Quality Monitoring



# Water Quality Monitoring

## How satellites can help?

- Provide ability to measure water quality in many more lakes (all over 0,5ha) more frequently and with better spatial coverage (ie more measurement points in v large lakes).
- Give earlier warning of degrading water quality.
- Supports evaluation of the impact of regulations on land-use and agricultural practices on the water quality

## Where satellites are helping:

- In active use in: Germany (core case), Finland (core case), Netherlands (core case).
- Under assessment in Austria, Belgium, France, Italy, Norway, Spain, but not yet in operational use.
- Some differences in use between regions with deep lakes and those with shallow ones where the temperature rises more quickly, agriculture is more intense and run-off a greater problem.

## The Benefits of using Satellites:

- Improved links between measurements and implementation of regulation (can be further improved with reference in the Water Framework Directive)
- Avoidance of costs of making in-situ measurements in many more lakes.
- Earlier detection of problems
- Improved bathing water quality information for citizens



# Water Quality Monitoring

## Insights:

- Satellite data provides the capability to monitor lake water quality over large areas and any number of lakes which is not possible using conventional means.
- Introduction so far is determined by local use since national reporting under the WFD is not required. As a result, investments and operational budgets are not granted.
- Only where local expertise and champions have promoted the use of satellite data has this become systematic (ie in Finland).
- Local conditions influence strongly the risk and the need for monitoring. In the Netherlands, the shallow waters heat more rapidly and intense agriculture leads to high chemical pollution, whilst in Finland the enormous number of lakes drives monitoring needs.
- Trusted agents have been instrumental in driving adoption. The environmental institute in Finland has been key whilst industrial actors have demonstrated the capability in Germany and the Netherlands.