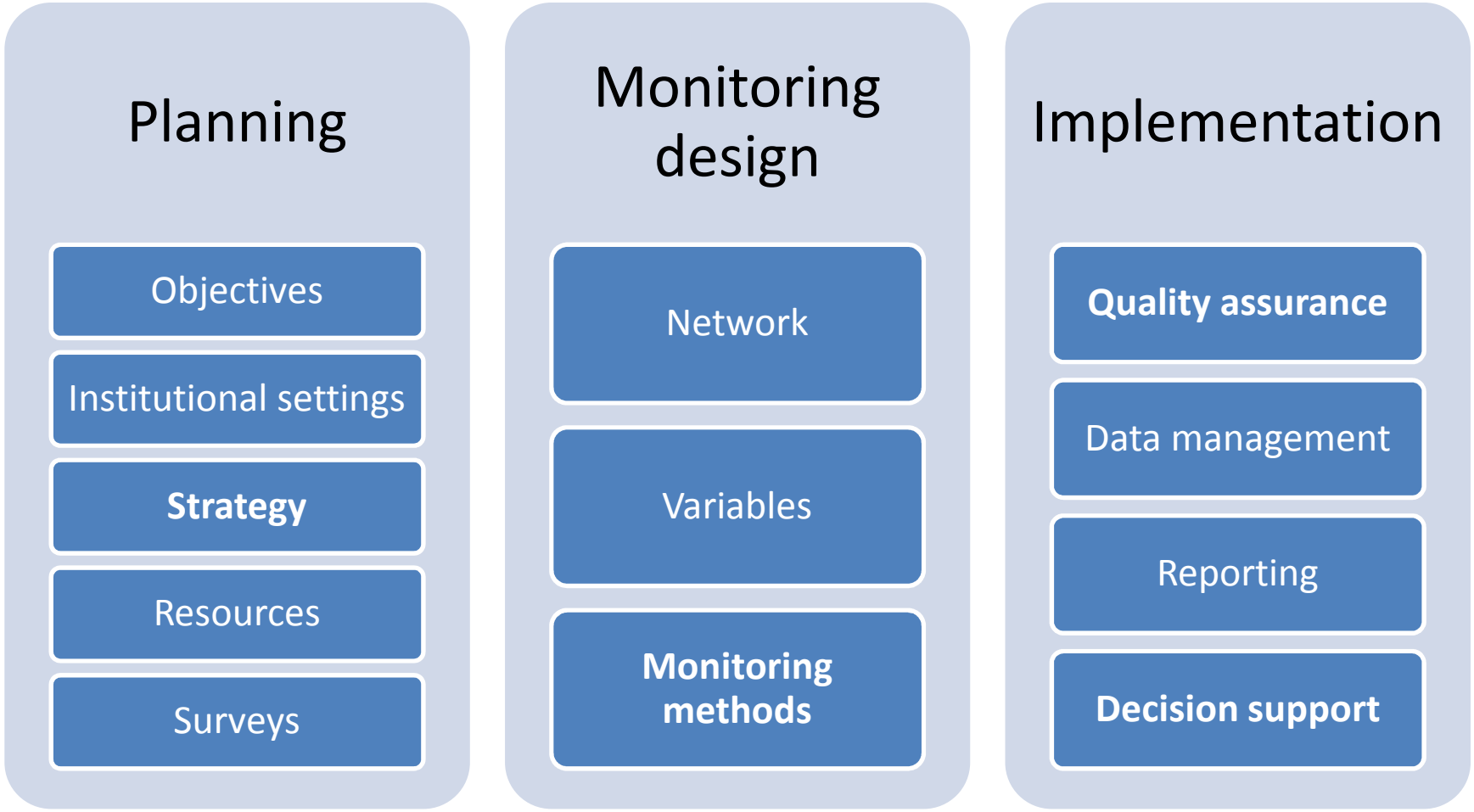
In-situ water quality monitoring

Philipp Saile
GEMS/Water Data Centre
Federal Institute of Hydrology

Fit for purpose



Fit for purpose

Uses/ functions / Issues	Human health	Ecosystem functioning	Fisheries	Recre–ation	Drinking-water	Irrigation	Industrial use	Hydro-power	Transport medium[1]	Navi-gation
Flooding	X	X		X					X	X
Scarcity	X	X	X	X	X	X	X	X	X	X
Erosion/ sedimentation	X	X			X			X	X	X
Biodiversity		X	X	X						
River continuity		X	X	X				X	X	X
Salinization		X			X	X	X			
Acidification[2]		X	X		X					
Organic pollution[3]	X	X	X	X	X					
Eutrophication	X	X	X	X	X	X	X			
Pollution (hazardous substances[4])	X	X	X	X	X	X	X			

WMO-No. 1113

Monitoring techniques

Field measurement

Automated monitoring

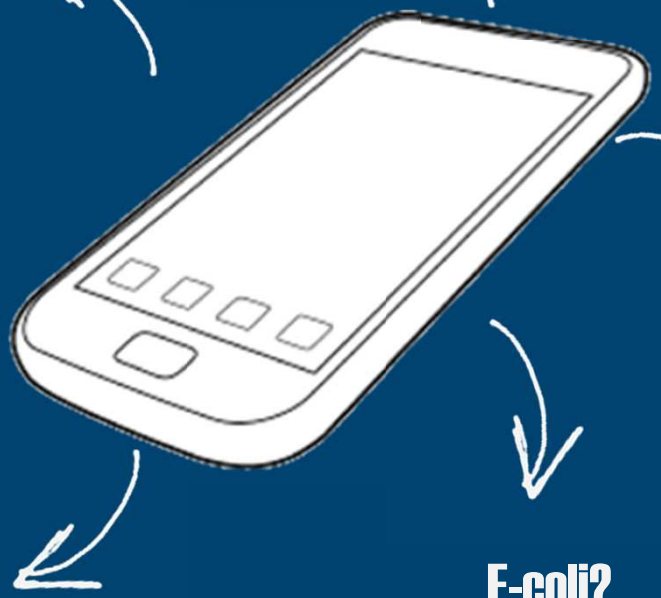
Sampling & laboratory analysis

Field measurements

Temperature and conductivity

Water level

?

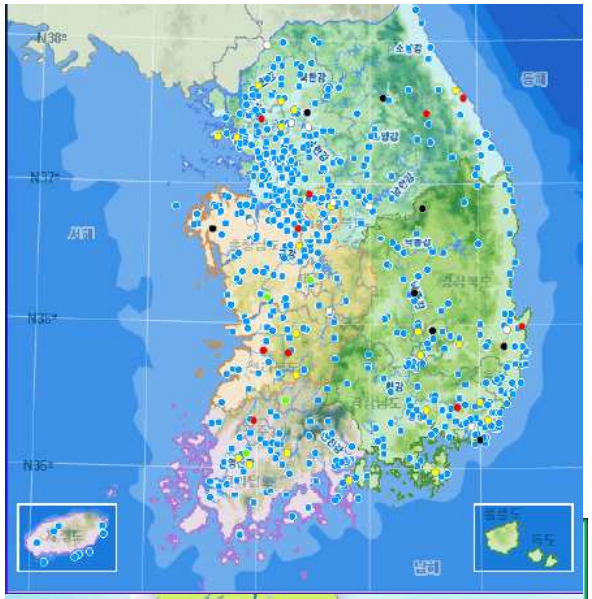


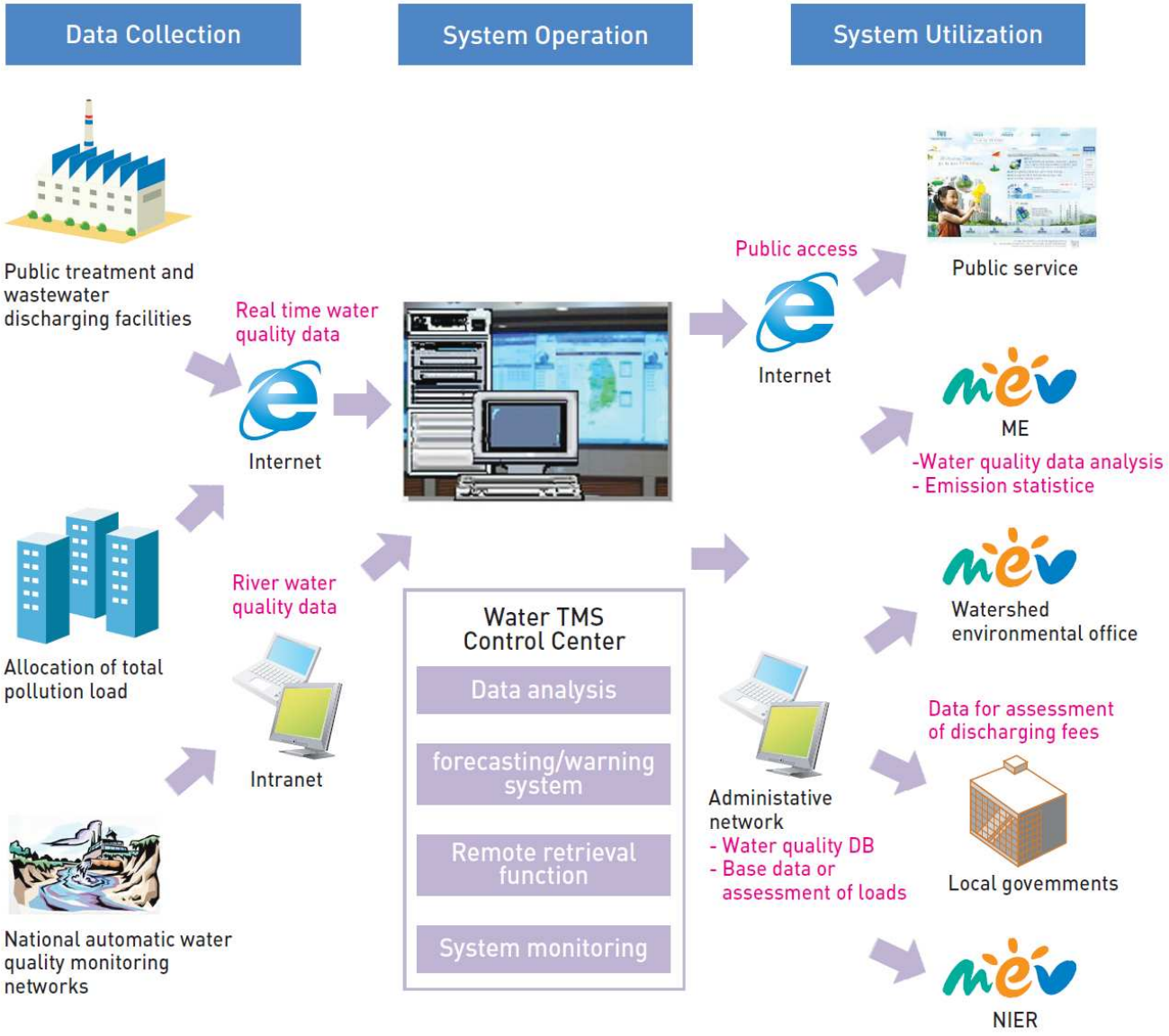
EC mS/cm

E-coli?

Spectrometer for No3, F, As,...

Automated monitoring





In situ vs sampling

Advantages

- Low cost
- Continuous surveillance
- Real-time
- High temporal and good spatial resolution

Shortcomings

- General precision
- Limited scope
- Technological requirements

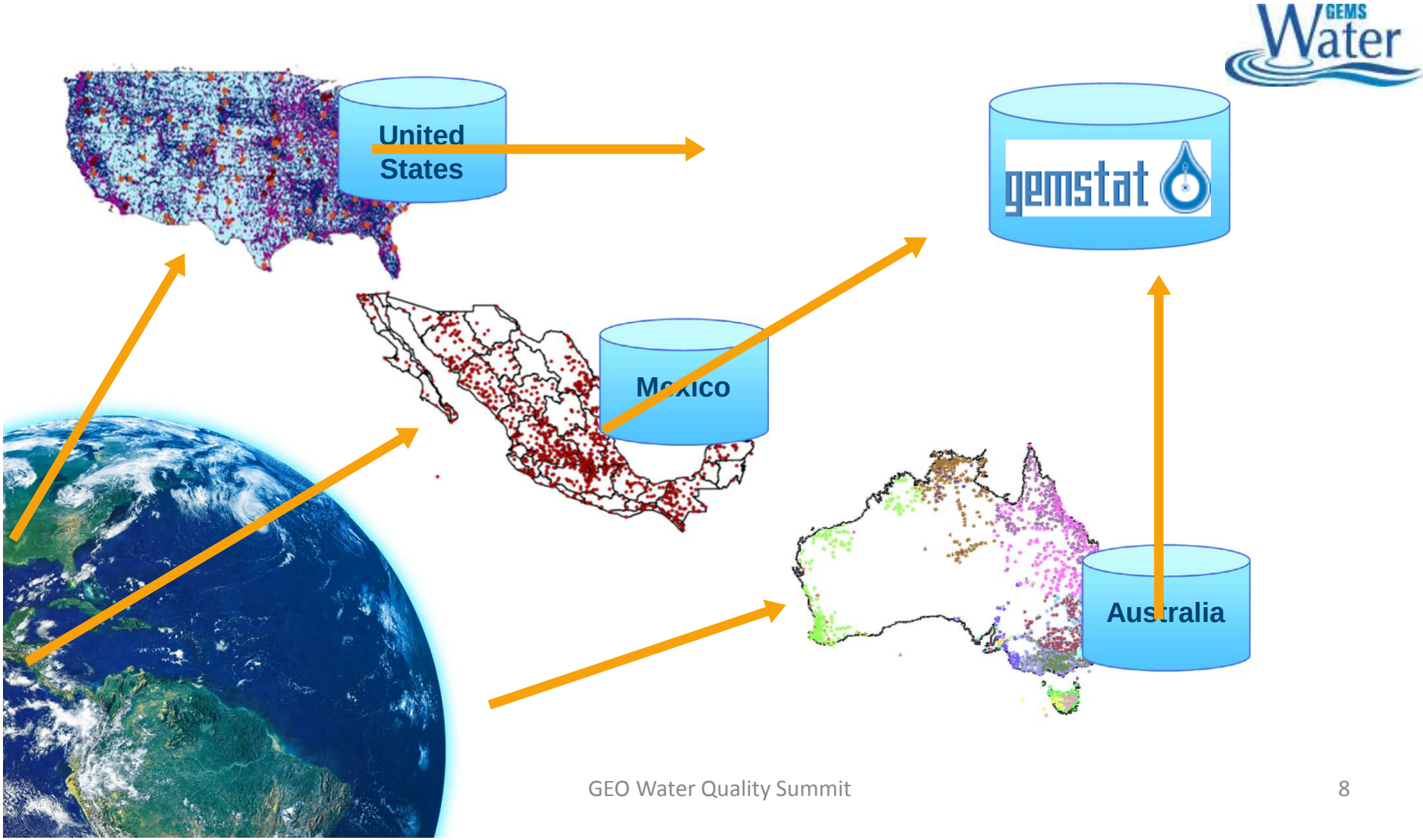
Advantages

- Fine temporal resolution
- High precision
- Pollutant fluxes
- Standardization possible

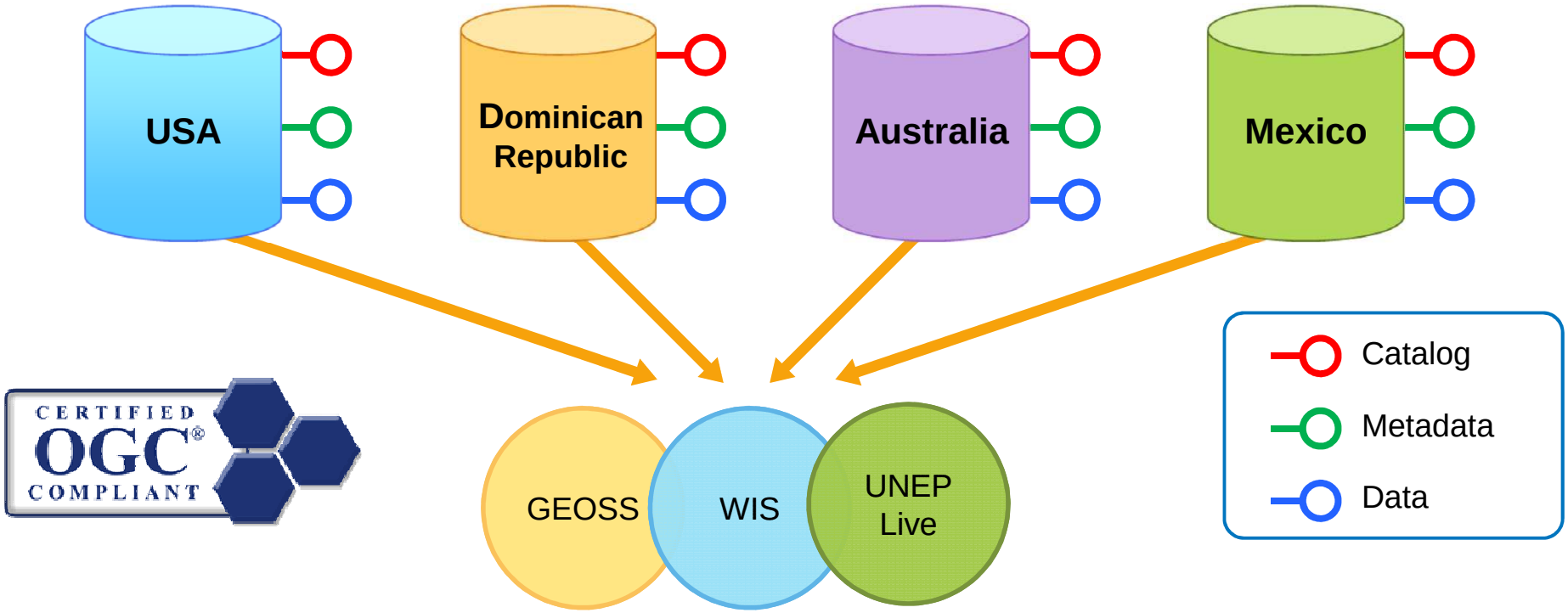
Shortcomings

- High costs
- High detection limits
- Sample contamination
- Limited continous surveillance

Data integration



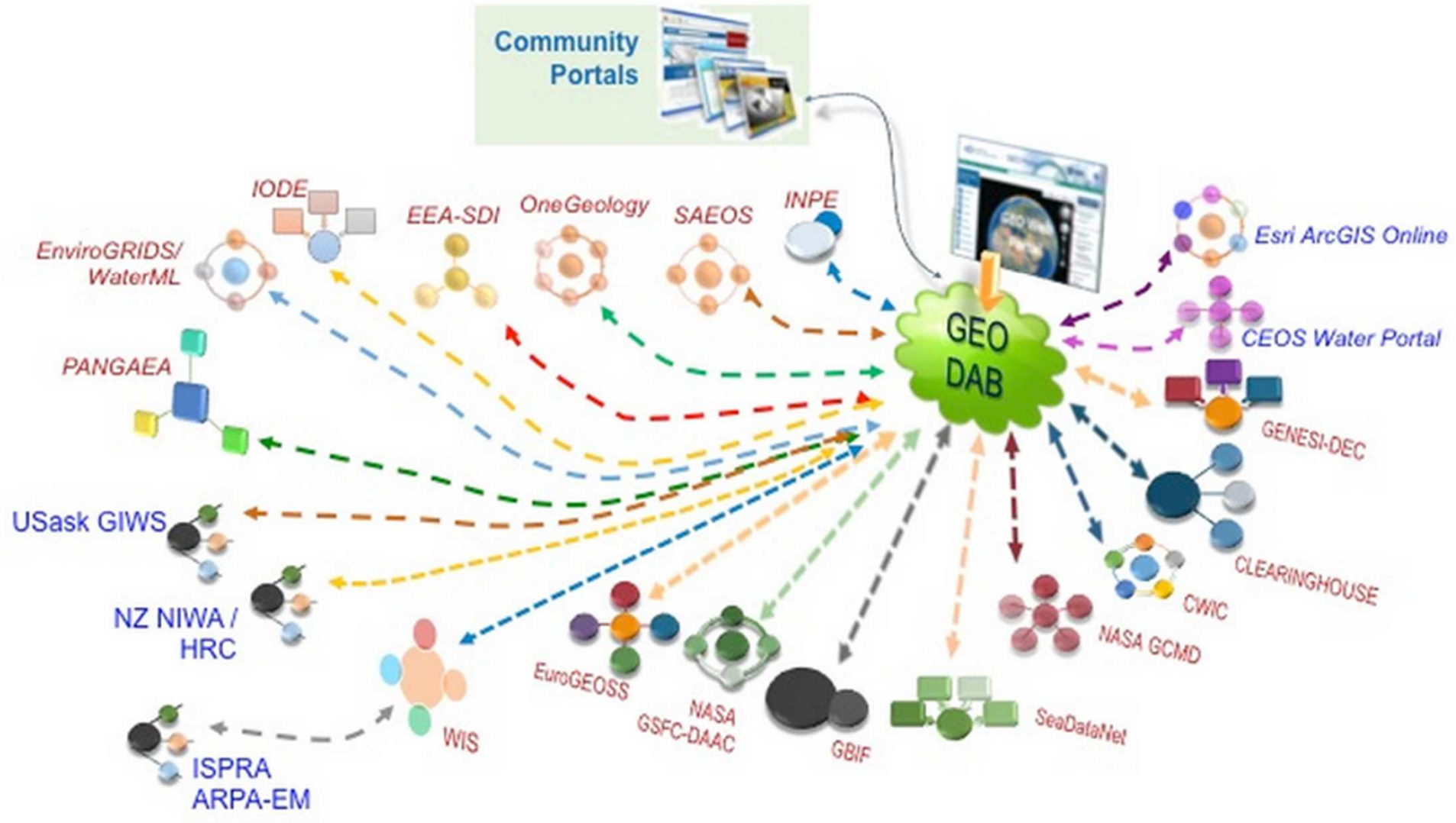
National service stacks…



GEOSS Indexes Geospatial Data . . .
. . . WIS Indexes Observational Data…
UNEP Live Indexes National Reporting Data

D. Maidment, CHy-14, 2012

Linking WIS and GEOSS



Conclusions

Opportunities

- New sensors
- Telemetry
- Crowd-sourcing

Shortcomings

- Harmonization
  - Quality assurance
- Data integration

Conclusion

Major efforts necessary to further develop and implement new monitoring techniques, harmonize monitoring and integrate data