GLOBOLAKES – ROLE OF THE UK ENVIRONMENT AGENCIES

JAN KROKOWSKI

BRENDA WALKER

BILL BRIERLEY

Overview

- UK Agencies
- Drivers
- Types of monitoring
- Classification
- Regulatory Involvement
- Applications / Challenges

Environment Agency
(of England and Wales)

- Area = 151,174 km^2

- Population = 54.175 million

- Land Use:

  70% agriculture (~26% crops, ~37% grazing)

  21% urban

  9% other

- WFD water bodies (WBs)

  5818 river WBs ~55102.5 km in length

  742 lake WBs ~329.3 km^2

- EA staff ~12,000

WATER FRAMEWORK DIRECTIVE
RIVER BASIN DISTRICTS IN THE UNITED KINGDOM

Northern Ireland

- Area = 13,843km^2

- Population =1.81 million

- 6.2% urban

- 55% farmed

- Largest Lake is Lough Neagh at 383 km^2

- Number of lochs with surface area >0.02km^2 208

- NIEA staff ~652 (end March 2012)

NIEA
Northern Ireland
Environment
Agency
www.ni-environment.gov.uk
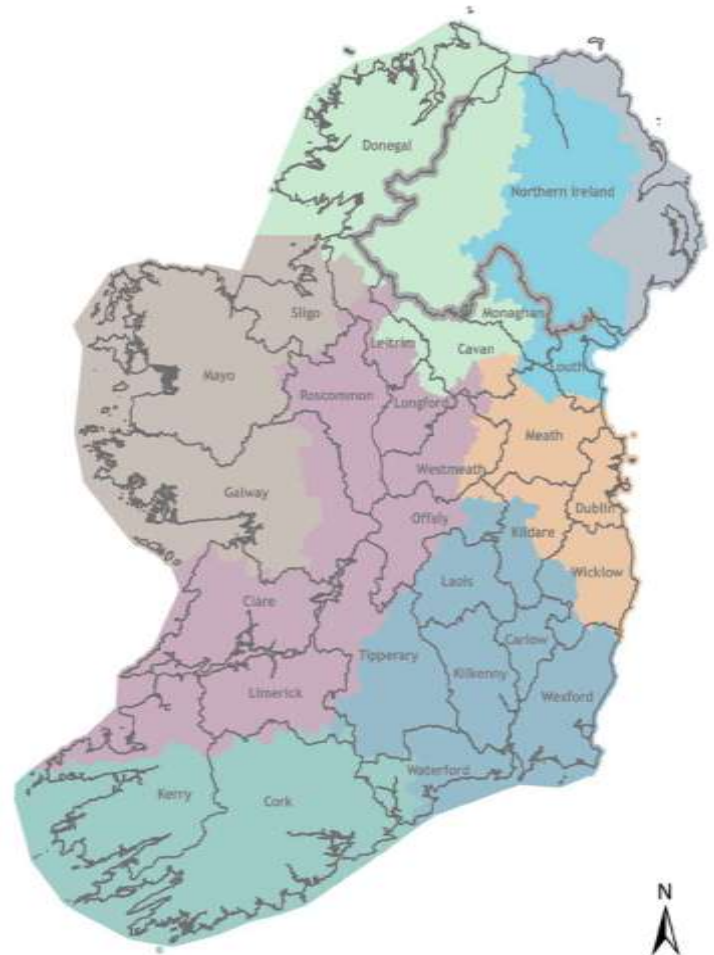
- Area = 78,000 km^2
- Population = 5 million
- 2% urban
- 6% prime agricultural land
- 26% covered by natural heritage designations
- Longest river is River Tay at 193 km
- Number of lochs with surface area >0.01km^2 25,615
- SEPA staff ~1200 (end March 2012)
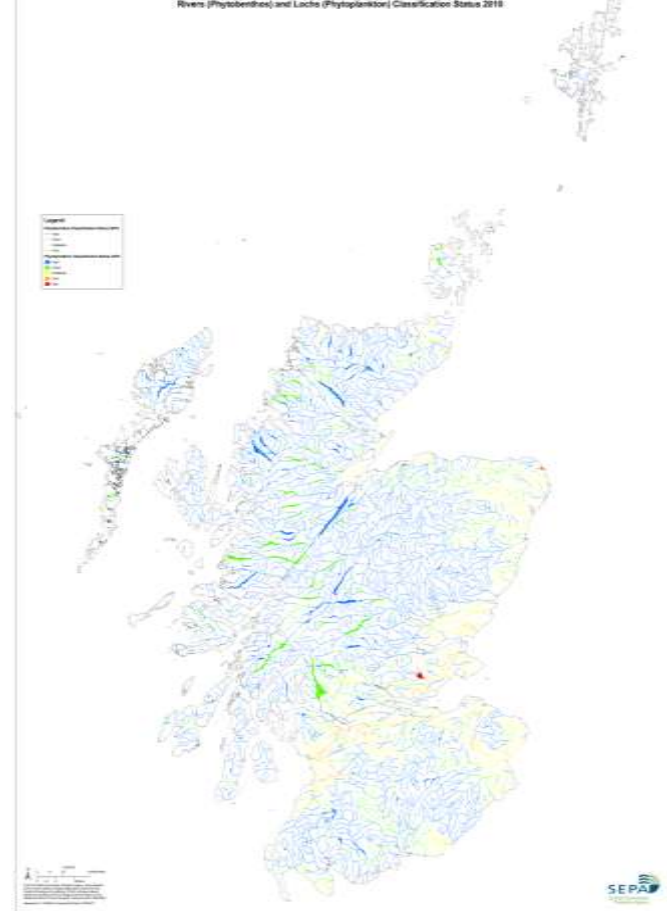
Role of Agencies

- Protect the environment and human health
- Promote sustainable development
- Regulate activities that cause pollution
- Monitor and report on the quality of the environment

Agencies drivers

- Legislative - EU Water Framework Directive, EU Nitrates Directive and EU Urban Wastewater Treatment Directive
- Analysis of pressures including eutrophication, acidification, hydromorphological alterations, non-native invasive species
- Monitoring to assess current status of waterbodies
- Evidence gathering to inform Programmes of Measures using a catchment based approach
- Lake restoration projects

Eutrophication is a key pressure

Map 9.9   Distribution of phosphorus concentration in European lakes and reservoirs by country.

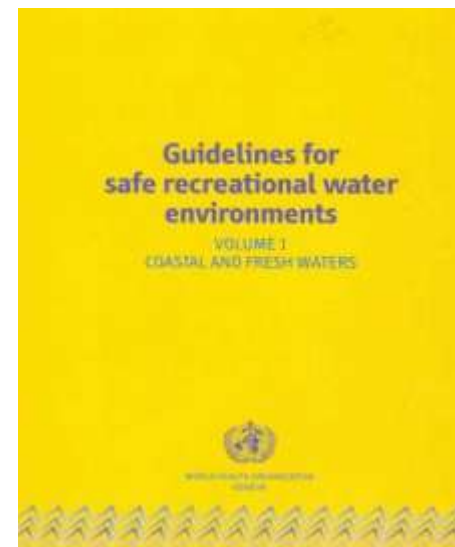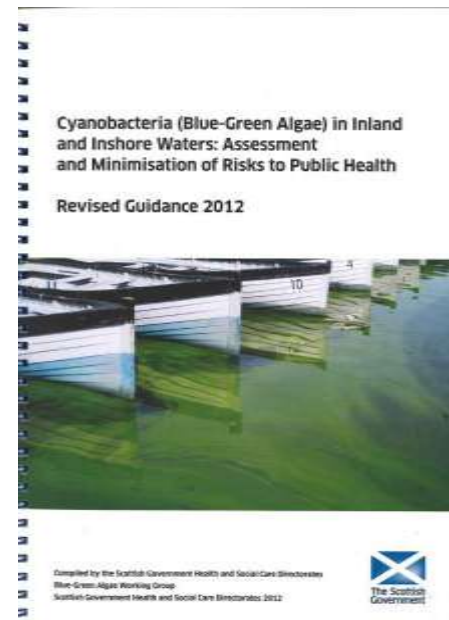Source: https://www.eea.europa.eu
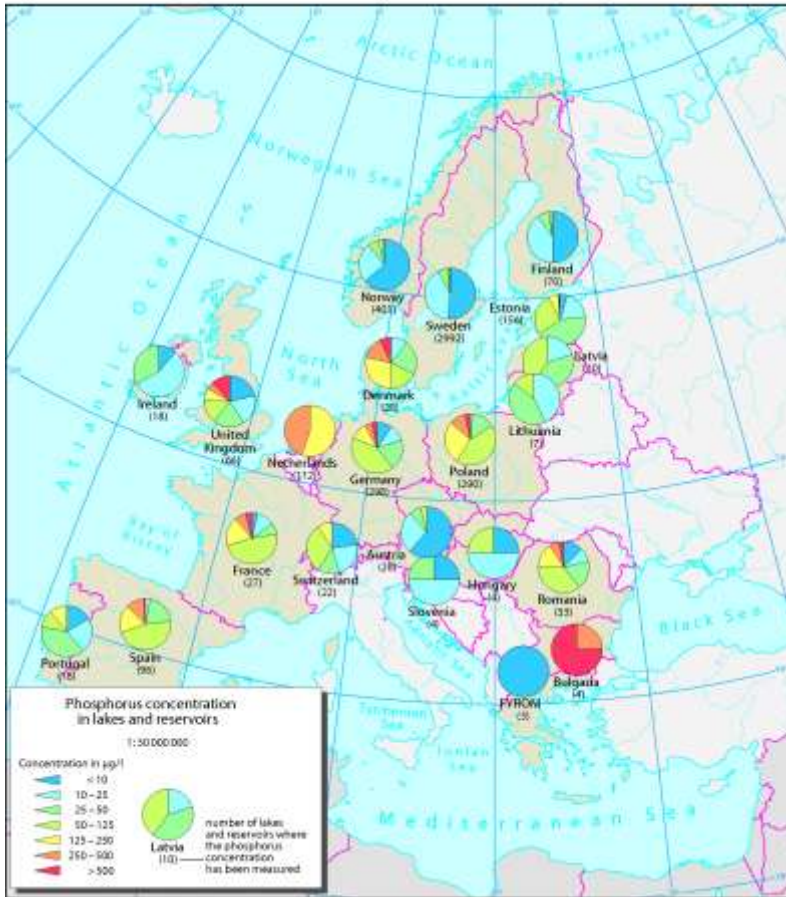
- Eutrophication remains a key issue for lakes in most of Europe

- Most severe in central Europe including much of UK

Regulatory Involvement

- Strategic opportunity
- Development of new approaches, new technologies
- Improve understanding of lake ecosystem functioning and responses
- Useful for development of operational tools for early-warning monitoring of algal blooms
- Help to understand lake responses to impacts, climate change, land-use etc.
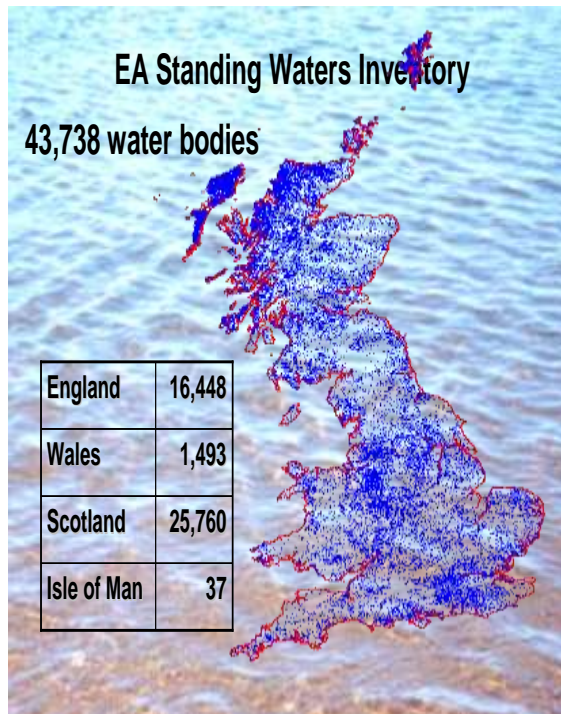
Cyanobacteria

- WFD driver - phytoplankton
  - bloom frequency and intensity
- Monitor and manage risks
  - Cyanobacteria risk to human health
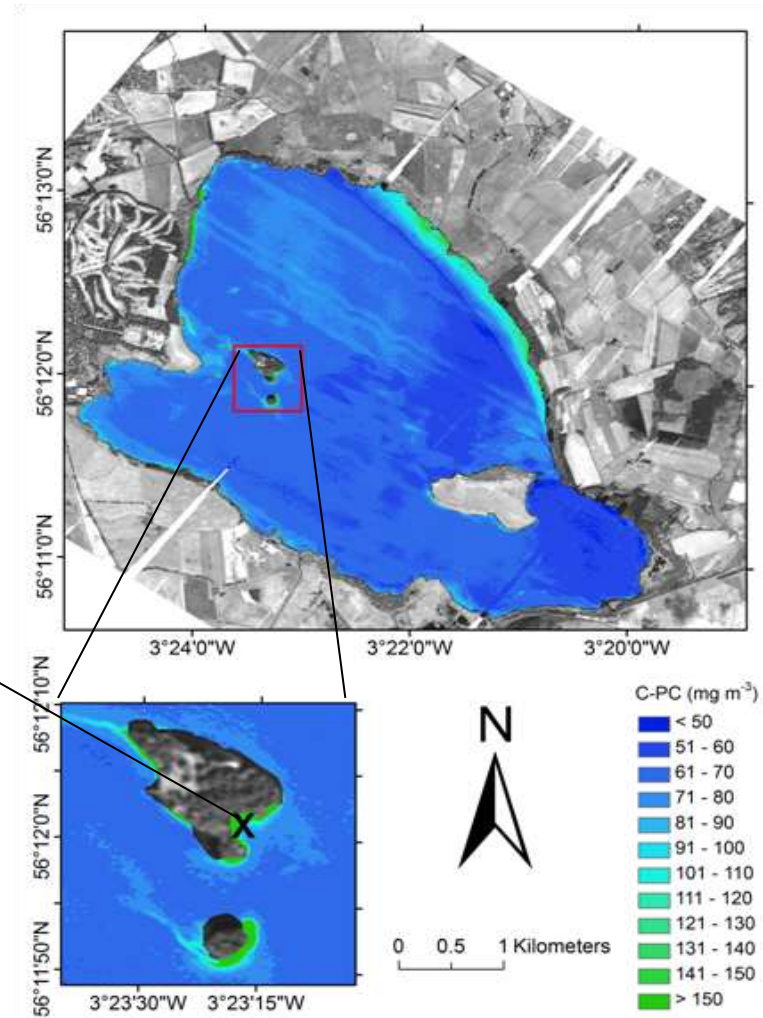 - many examples of human illness and animal poisonings in UK and worldwide

Cyanobacteria (Blue-Green Algae) in Inland and Inshore Waters: Assessment and Minimisation of Risks to Public Health

Revised Guidance 2012

Compiled by the Scottish Government Health and Social Care Directorates Blue-Green Algae Working Group
Scottish Government Health and Social Care Directorates 2012

Guidelines for safe recreational water environments

VOLUME 1
COASTAL AND FRESH WATERS

Scale of the problem

- No comprehensive network for monitoring blooms in lakes
- National events cancelled

EA Standing Waters Inventory

43,738 water bodies

England	16,448
Wales	1,493
Scotland	25,760
Isle of Man	37

Across UK, 1/3 ad-hoc samples contain cyanobacteria >thresholds

State of the Art

Collaborative pilot project

- New Remote sensing techniques
  - Stirling University & Plymouth Marine Laboratory

- Volunteer monitoring/Citizen Science developing new networks – Freshwater Biological Association, Wildlife Trusts & public

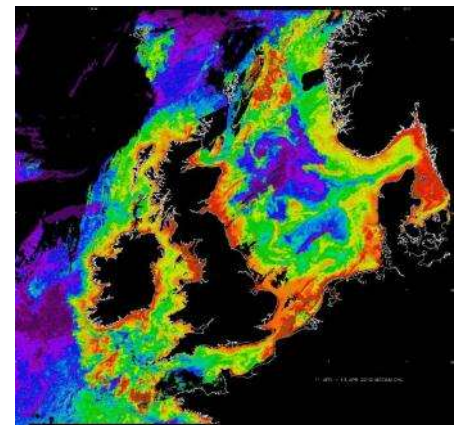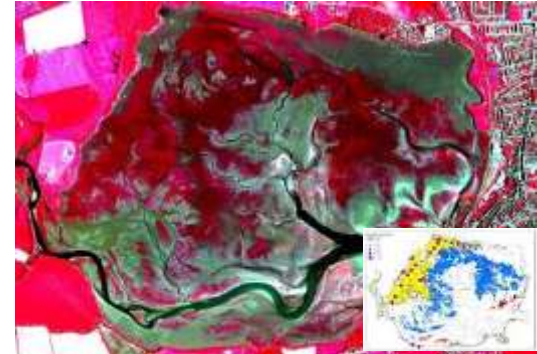- Utilising detailed Environment Agency from WFD monitored lakes

Volunteer monitoring – where and what ?

- Windermere, Bassenthwaite and Derwentwater
  - 2 sites per lake
  - standard length of shore
- Visited at least once per week
  - visual inspection & white stick test
  - photos taken
  - sample taken if bloom suspected & forwarded to FBA
  - record sheet completed and submitted to FBA
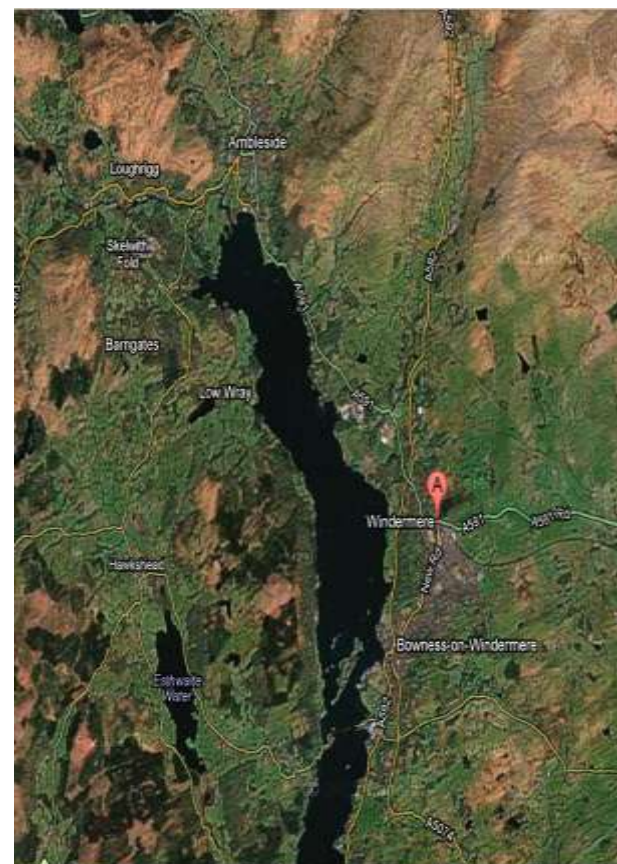
Marine application

- Environment Agency - AlgaRisk model
  - Used operationally
- SEPA
  - Used operationally in Montrose basin
  - WFD macroalgal blooming, salt marsh and sea grass monitoring
  - Unmanned aerial vehicle
  - NEODAAS portal helpful for marine phytoplankton spot sampling in context
- NIEA
  - Telepresence ROV
  - Aerial drones

Future…

Now…

ENVISAT
Polar orbiting at
~800 km altitude
Images whole
globe in 1-3 days

EA Standing Waters Inventory
Progress Report Nov 2001
Mike Hughes, ENSIS, UCL

43,738 water bodies
2832 island polygons

England	16,448
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