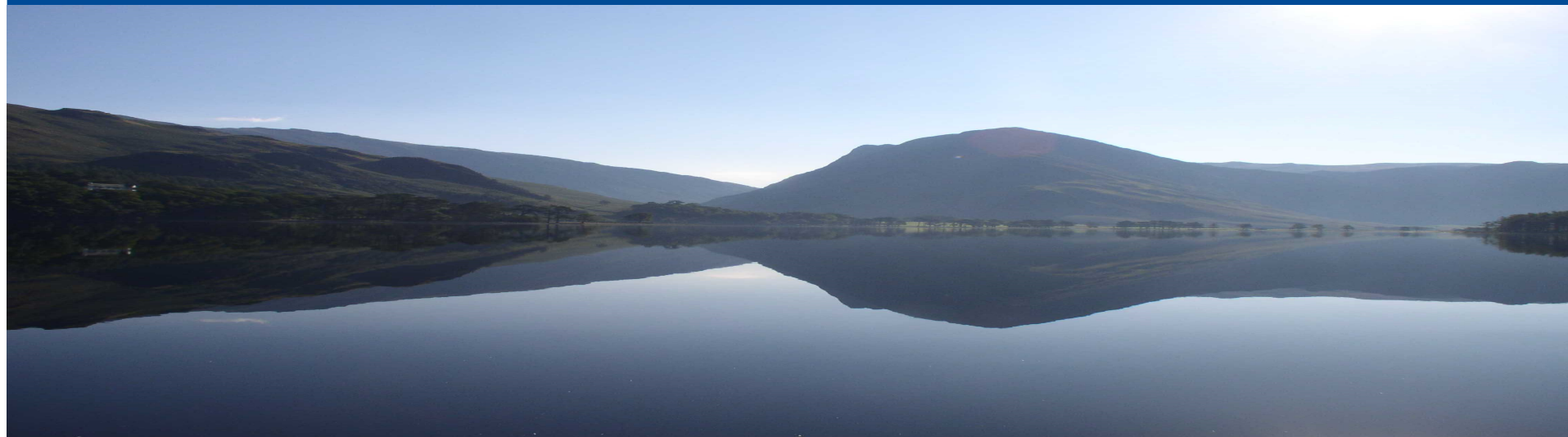
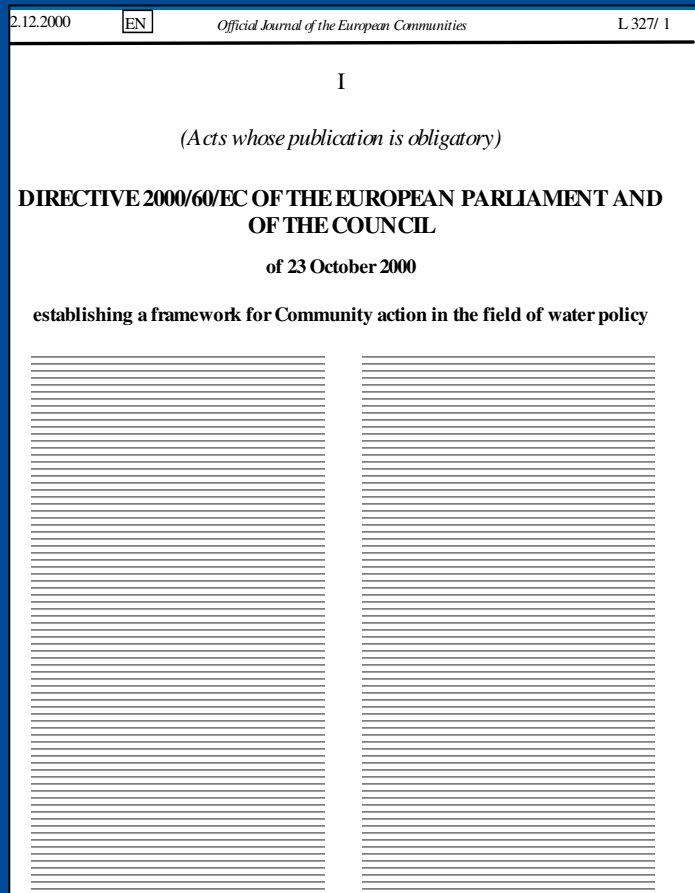


# Lake monitoring and the WFD: what are we doing?



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Research, Analysis and Evaluation  
13 October 2016

# A short history of the WFD....



- ➔ 2001 onwards
  - ➔ UKTAG, Task Teams, NS Share
  - ➔ tool development, pilot monitoring
  - ➔ characterisation, intercalibration
- ➔ 2007 monitoring proper
- ➔ 2009 RBP1
  - ➔ Classification, more tool development, intercalibration
- ➔ 2015 RBP2.....2027?

# Lakes – what did we know to start with?

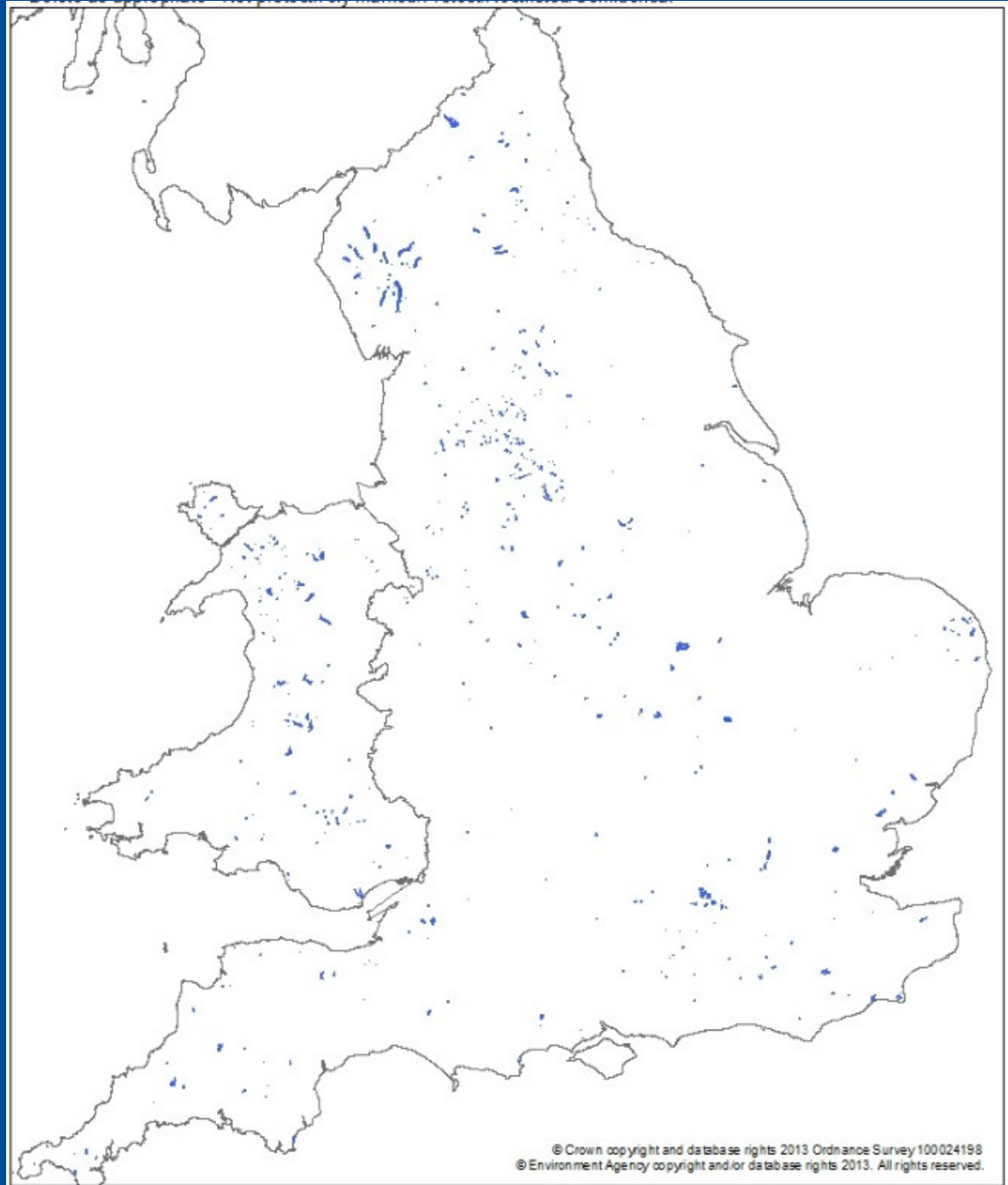
- ➔ Varied between UK countries and regions within the countries
- ➔ No consistent national monitoring/assessment programmes
- ➔ No agreed tools/standards
  - OECD thresholds for TP, chlorophyll
  - Trophic Ranking System (macrophytes)
  - WHO thresholds for cyanobacteria
  - Conservation Agency assessments SSSI, SAC/SPA
  - Other directives: UWWTD, FWFD, SWAD reporting

# What the WFD has changed for lakes

- ➔ New data
- ➔ New assessment methods
- ➔ Define reference conditions (few actual examples) and concept of “good status”
- ➔ UKTAG – regulatory and conservation agencies working closely with academics
- ➔ European perspective
- ➔ National monitoring programme, WQ and biology, from 2007

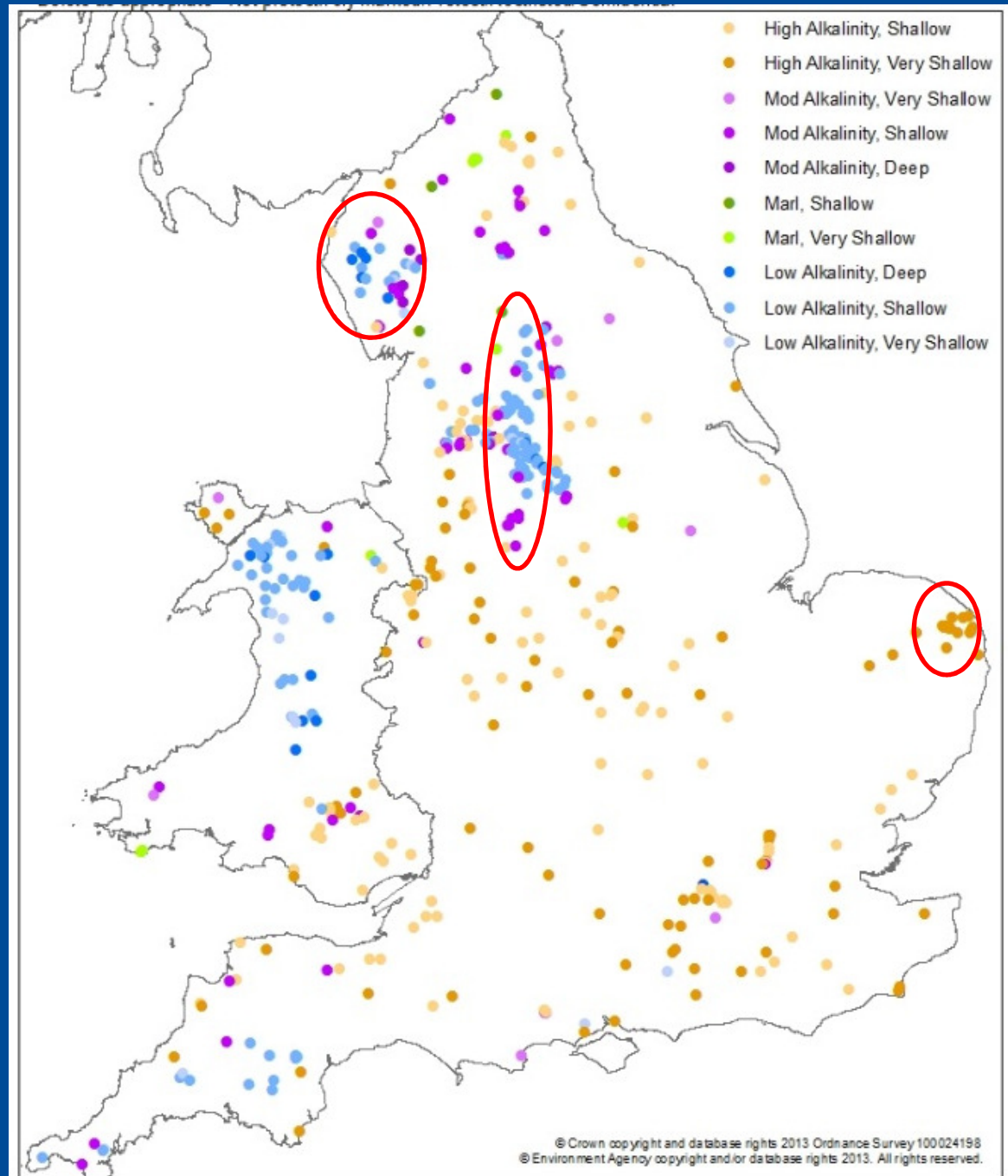
## WFD Lake water bodies

- many very small lakes
- reservoirs
- geographically uneven spread
- 589 England
- 124 Wales



## Lake types

- Alkalinity and depth
- Distinct clusters mainly related to alkalinity



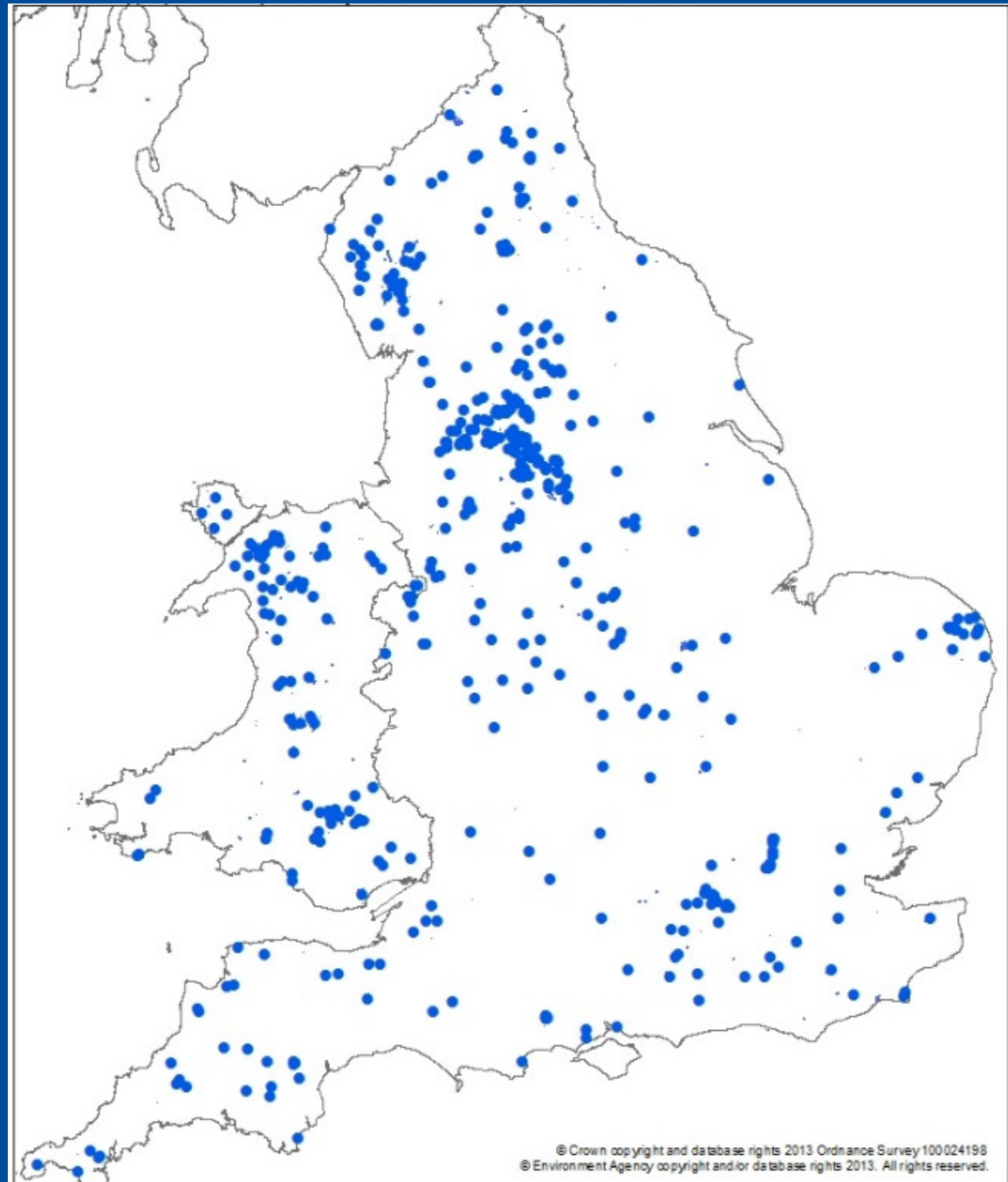
# Monitoring

- ➔ National programmes
- ➔ Standard methods
- ➔ Data sharing & multiple use
  - ➔ Condition assessment, Nitrates and UWWT Directives
- ➔ Formally 2007 onwards, but pilot from 2003
  - ➔ *Significant* amount of new information gathered
- ➔ But what is monitored, where, and how often varies



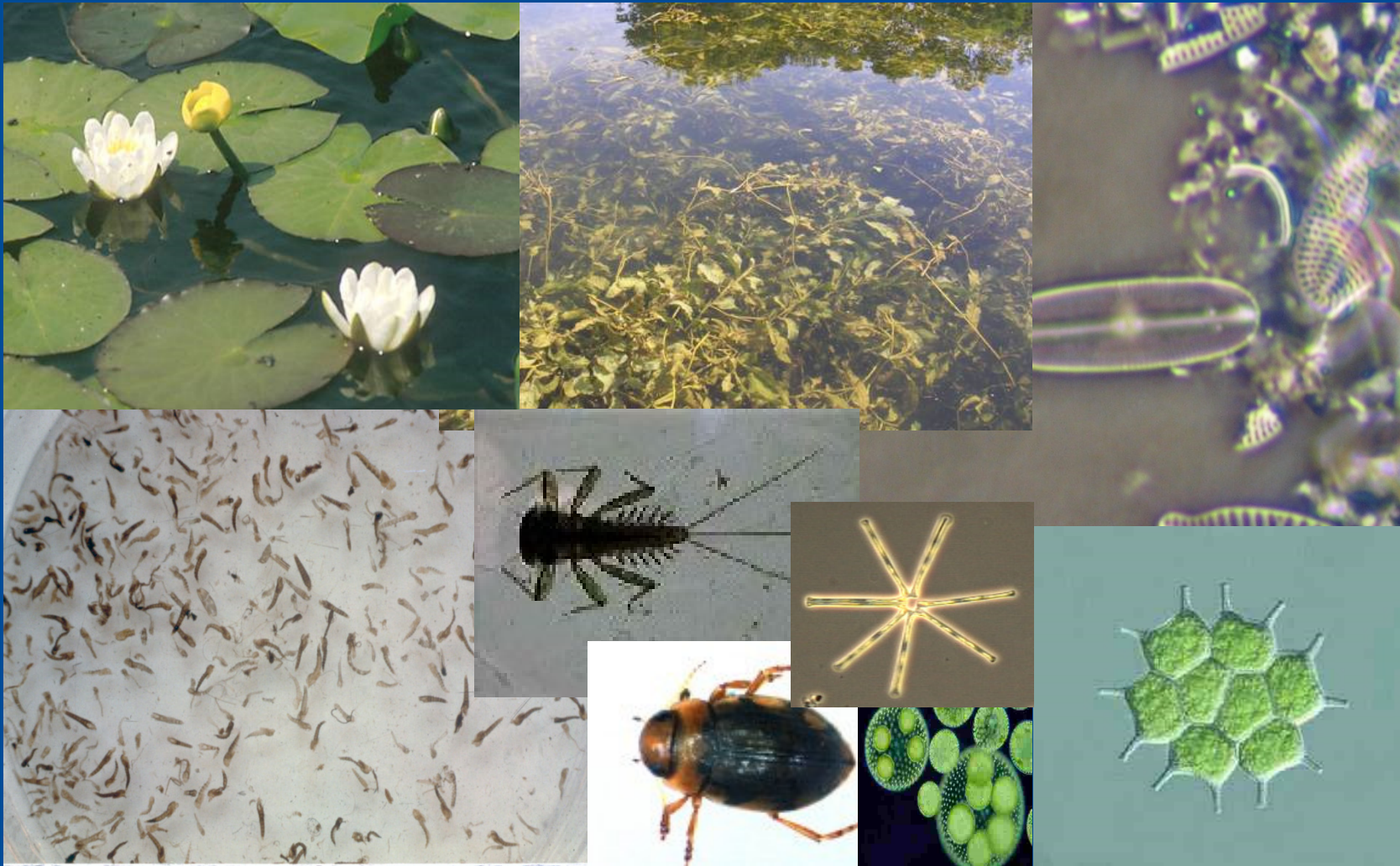
## Lake monitoring

- Not all water bodies
- 5 ha size cut-off
- surveillance/  
operational
- c400 England
- 37 Cumbria



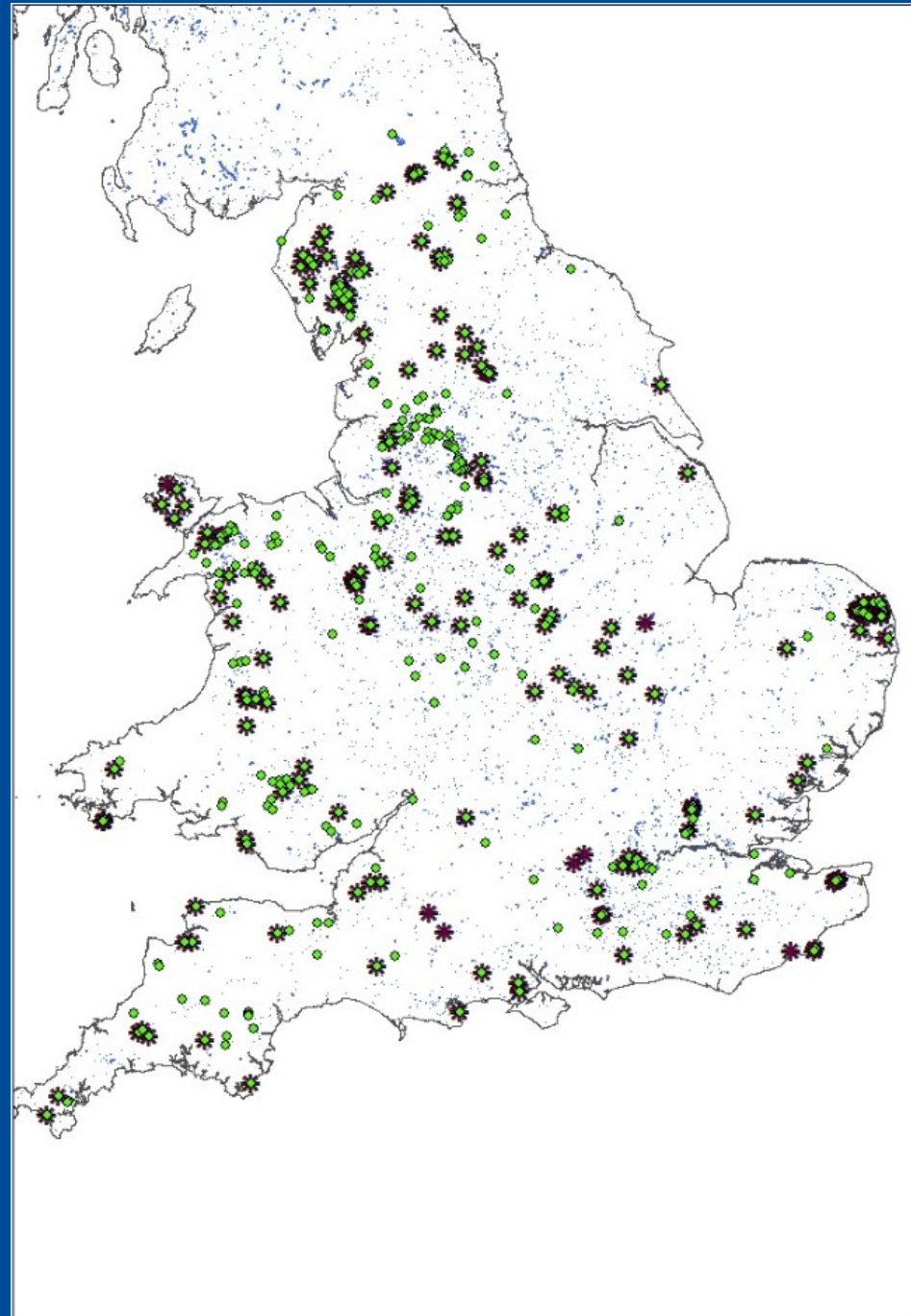


# What is monitored?



## Phytoplankton

- chlorophyll only
- chlorophyll + taxonomy
- both can give a classification





# Monitoring – how often?



# Lake Monitoring – some numbers....

➔ Since 2007, approximately:

➔ 430 macrophyte surveys

➔ 3870 phytoplankton samples

➔ 1158 diatom samples

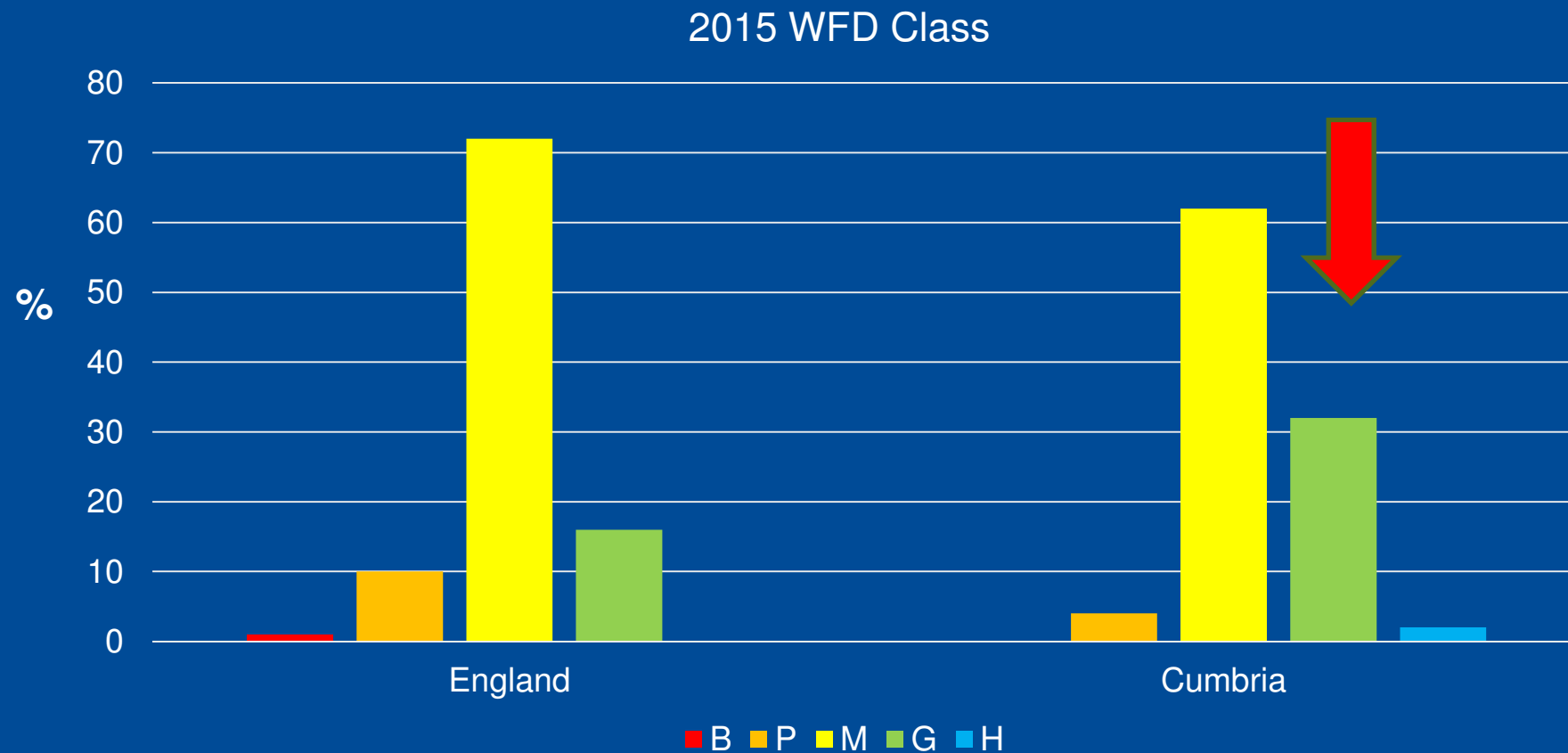
➔ 772 CPET samples

➔ 27,336 water quality samples

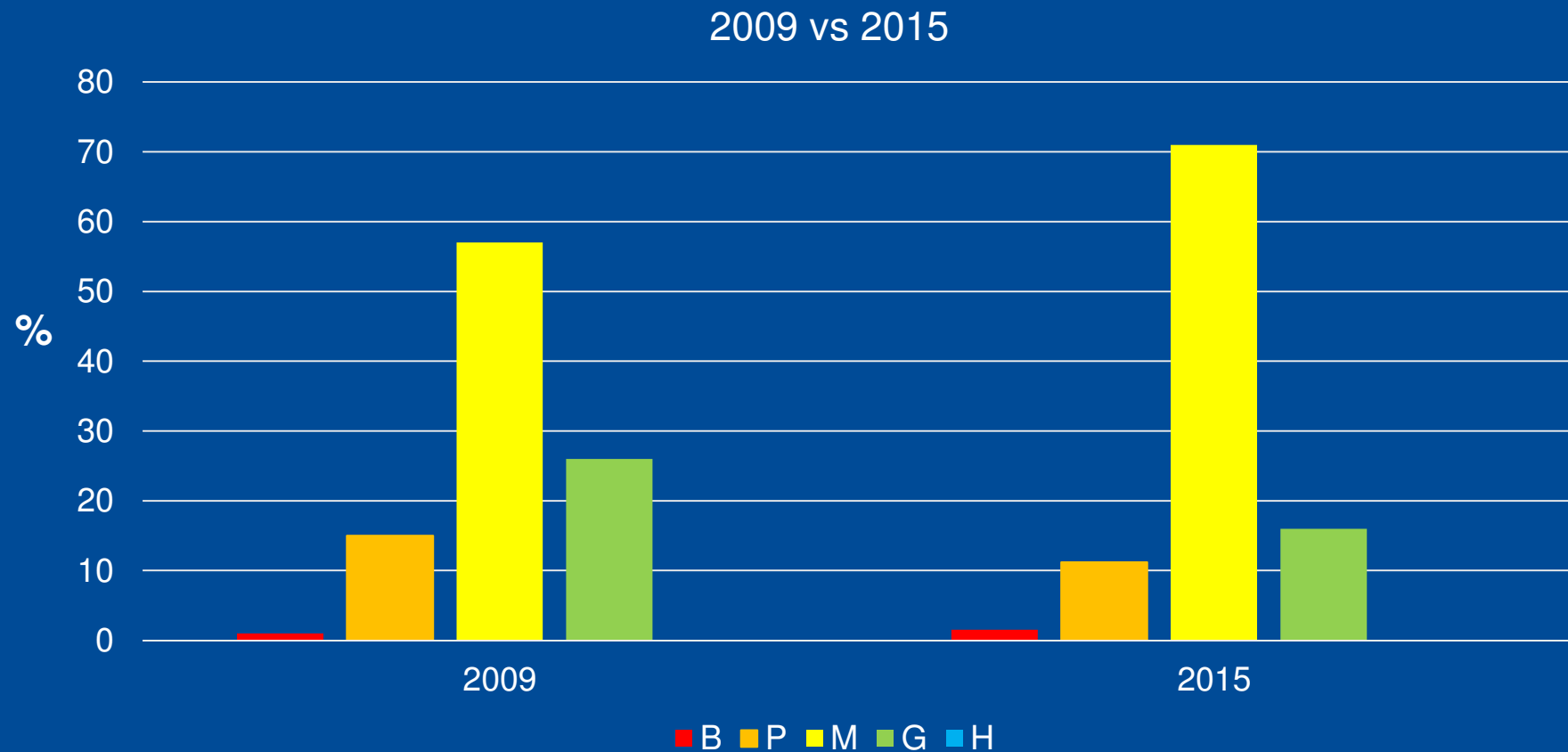
- Nutrients, chlorophyll, alkalinity, colour

➔ What have we learnt?

# State of our lakes?



# Change over time?



## Moving on.....

- ➔ The overall classification is a fairly blunt instrument, 'One out, all out'
  - ➔ Results - might be contradictory at element level
  - ➔ Elements respond on different timescales
- ➔ What about other (non-WFD) evidence?
  - ➔ "Weight of Evidence"
- ➔ Multiple pressures?
- ➔ Long term trends?



# Conclusions?

- The WFD has (so far) been a good thing for lakes
  - Tools for assessment
  - Collaboration between agencies and countries
  - Information on the state of our lakes and evidence for making improvements
- We've generated lots of data.....can you use it?



