How will we access hydrological data in the future?

(or how should we be making it available already?)

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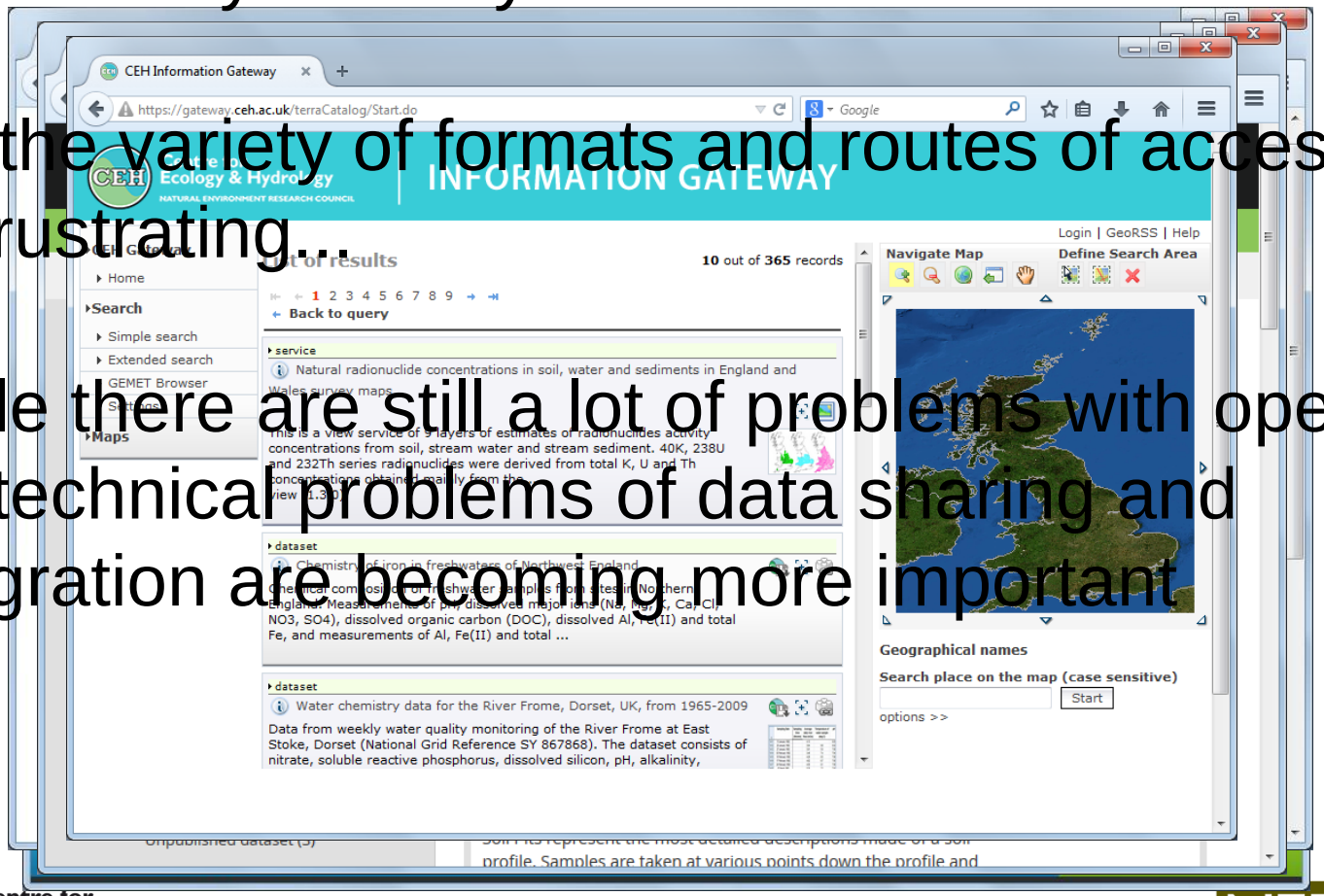
Improvements in access to hydrological data

There have been some huge improvements in data accessibility recently...

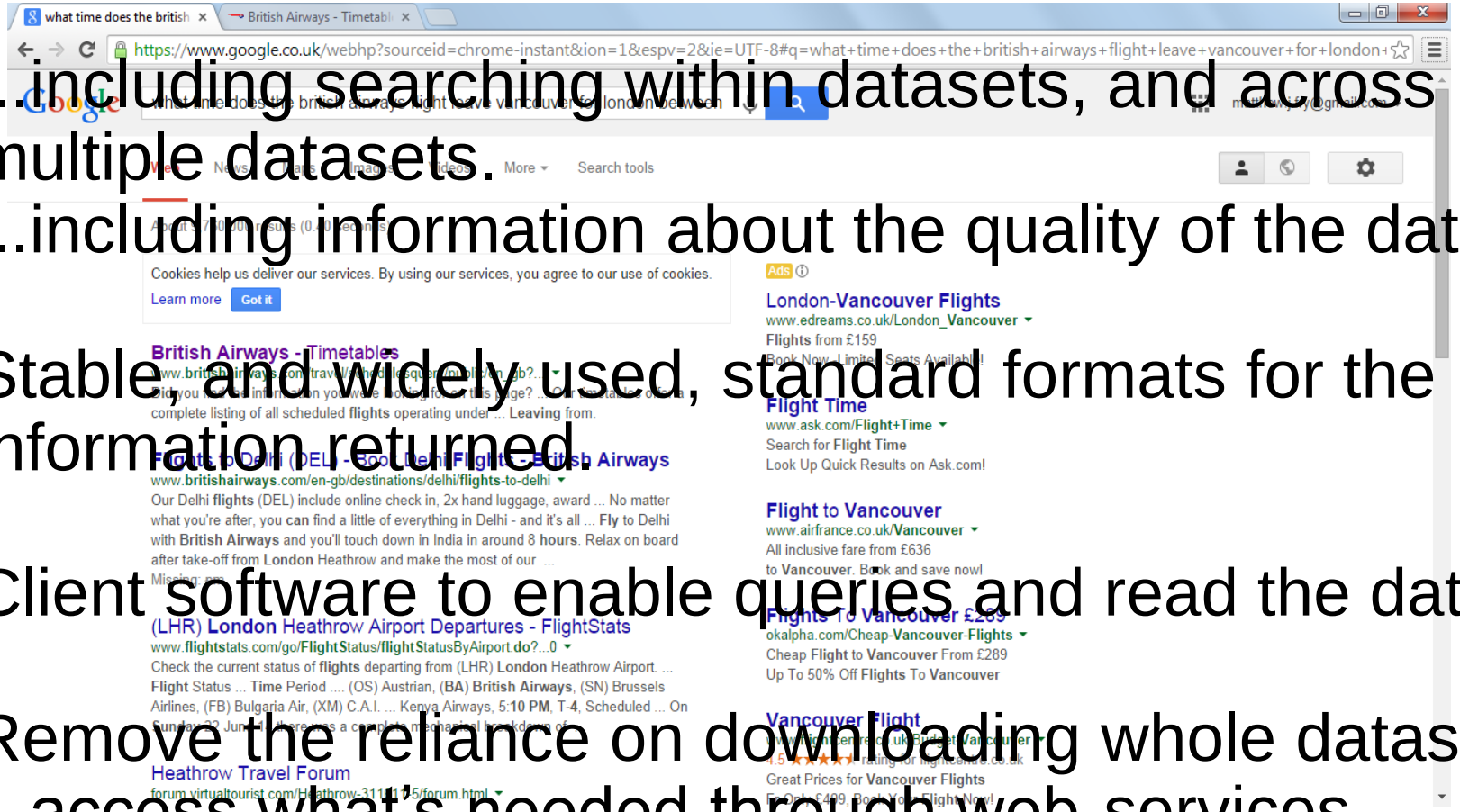
But the variety of formats and routes of access can be frustrating...

While there are still a lot of problems with openness, the technical problems of data sharing and integration are becoming more important



What's needed for better access?

Improved ways to search...



...including searching within datasets, and across multiple datasets.

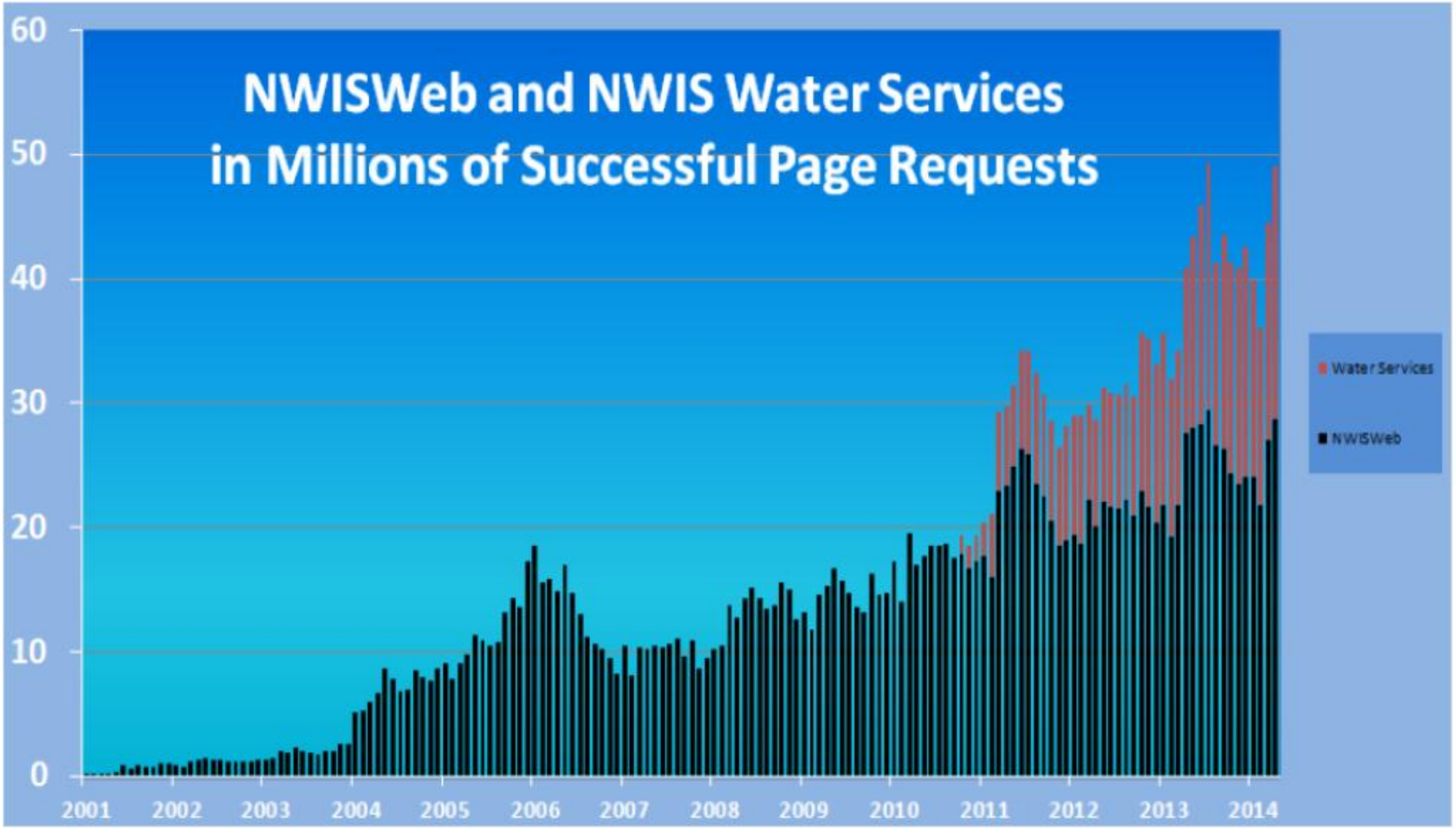
...including information about the quality of the data.

Stable, and widely used, standard formats for the information returned.

Client software to enable queries and read the data.

Remove the reliance on downloading whole datasets – access what's needed through web-services.

Web services for hydrological data



CEH and the National River Flow Archive

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You are here: CEH Web | National River Flow Archive | Search for data

- National River Flow Archive Home Page
- Search for NRFA data
- Search by regional maps
- NRFA Data Holdings
- NRFA Data Retrieval
- National Hydrological Monitoring Programme
- Hydrometry in the UK
- NRFA Publications
- Long records
- Contacts

National River Flow Archive: Search for gauging stations

1. Select search method

Search by gauged daily flow statistics

2. Select attribute to search on

Search by base flow index

3. Set search options

BFI > 0.7

4. Search peak flow or daily flow stations

Both

Search...

Clear maps...

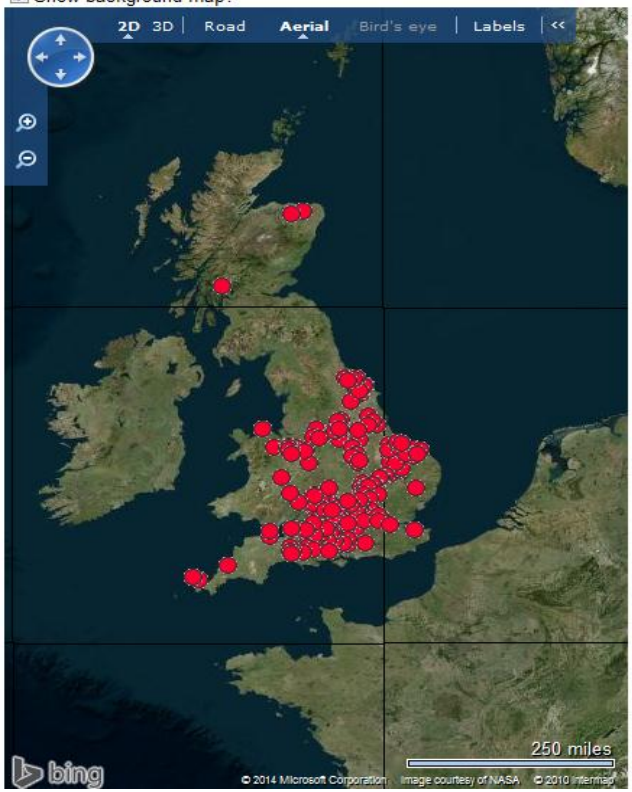
216 stations found.

Red dots show indicative station location only.

Click on the station number to access station and catchment information and, where available, download river flow data.

A map is provided to allow gauging stations to be located, and for contextual location information. click below to turn this map off if download speeds for your internet connection cause this page to run too slowly.

Show background map?



Stations displayed

No.	River	Location	Area (km^2)	GDF data period	GDF download
10001	Ythan	Ardlethen	448.1	1965-1982	N
10003	Ythan	Ellon	523.0	1983-2013	N
11004	Urie	Pitcaple	198.0	1984-2013	N
26001	West Beck	Wansford Bridge	192.0	1953-1974	N
26002	Hull	Hempholme Lock	378.1	1961-2013	N
26003	Foston Beck	Foston Mill	57.2	1959-2013	Y
26004	Gypsey Race	Bridlington	253.8	1971-1985	N
26005	Gypsey Race	Boynton	240.0	1981-2013	Y

Why do we need data standards?

- Data formats needed to provide comprehensive information about what the data means.
- Allow for client software to be developed.
- Ease of sharing across communities.
- Save time in adapting to new formats and syntaxes.
- Gives data providers something to aim for.

Water data standards

OGC®
Making location count.
www.opengeospatial.org

Open Geospatial Consortium

- Hydrology Domain Working Group

World Meteorological Organization

Initiated in 2009

CUAHSI HIS
Sharing hydrologic data

USGS
science for a changing world

Developing WaterML2 standard

KISTERS

CSIRO

AQUATIC INFORMATICS™

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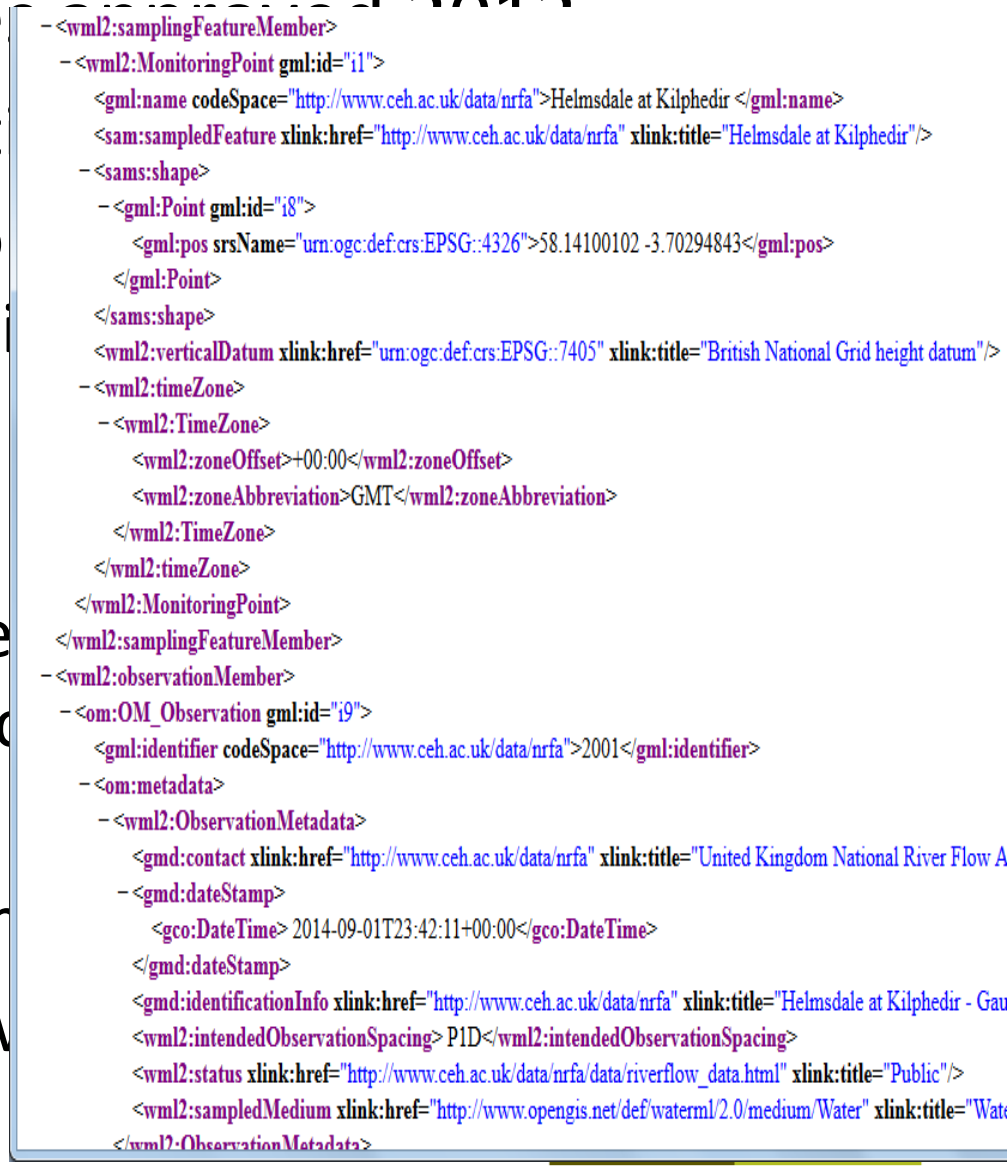
WaterML2

Part 1 on water time serie approved 2012

- Allows for detailed descript
- Allows attribution with info measurement methods, uni etc.
- ...but it's a complex format
- Being adapted to TimeSerie Meteorological and Ocean c WMO uptake.
- Part 2 on ratings and gaugir
- Further work proposed on v



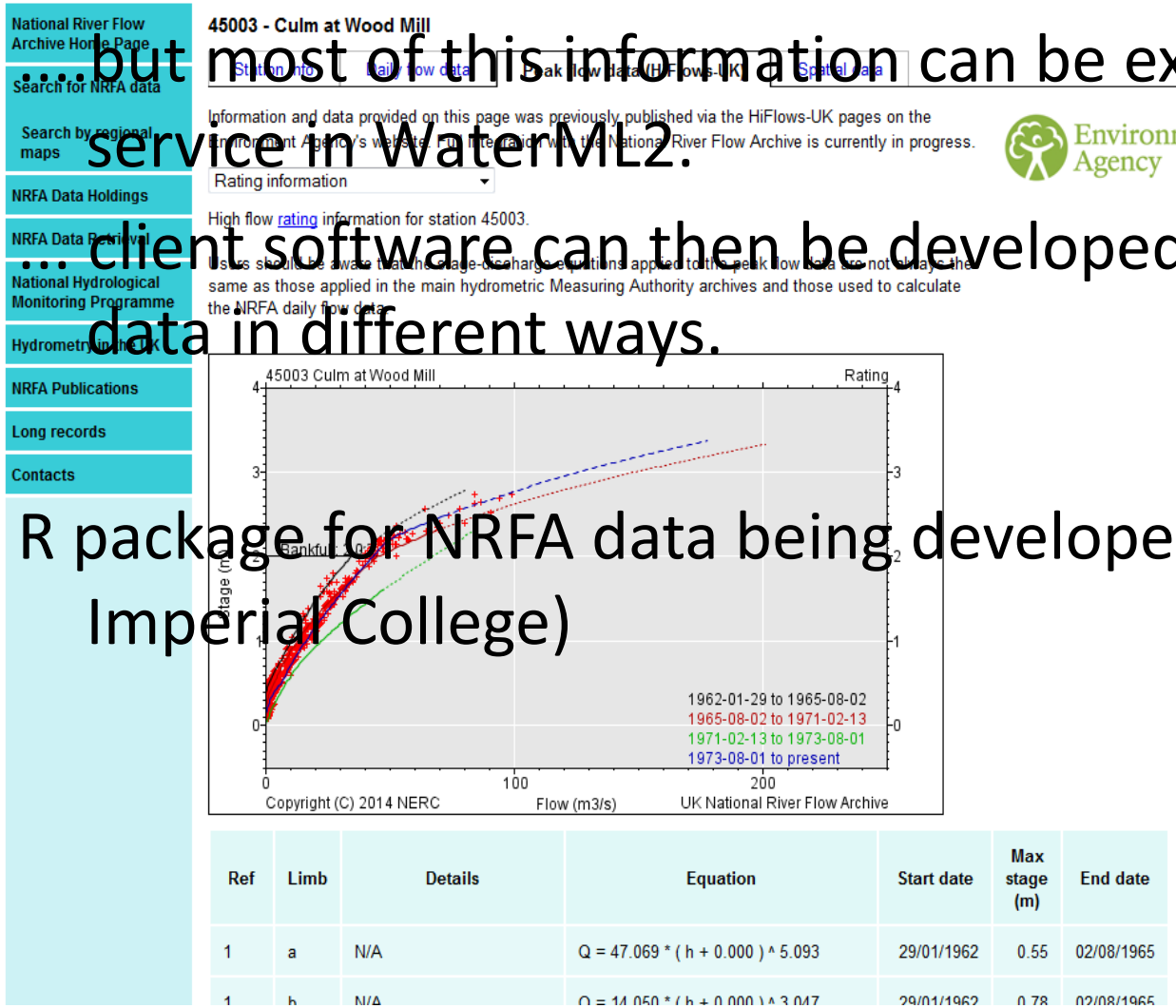
WaterML2 part 2 example

NRFA Peak flow (Hiflows-UK) pages allow users to view ratings and gaugings information.

....but most of this information can be exposed as a web-service in WaterML2.

... client software can then be developed to display the data in different ways.

R package for NRFA data being developed (Claudia Vitolo, Imperial College)



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Will standards meet all needs?

- Standards provide the means to link into wider networks seamlessly, and be consumed by common software platforms

- Complexity can be a barrier to use

- Standard format may not allow for specific local information to be exchanged

- Likely to be a need to support international standards, with more flexible models to

Searching hydrological datasets

- Sensor Observation Services (SOS)
- Existing standard for accessing measurement data.
- Allows queries of what is measured where and when, and for retrieval of data.
- Potential for search across multiple datasets.
- Response in standards-based formats
- CEH are investigating the SOS technology for dissemination of research monitoring data – LOIS water quality data, COSMOS-UK, others...

So... how will we access data?

- Standards are being developed for water data – for searching for and accessing data

- These should enable more detailed identification and rapid access to a wide range of measurement data – for general purposes.

- They are being adopted or considered by some major international organisations.

- Client software is being developed / modified to work with these standards

- For specialised access we will still rely on specialist applications.

- CEH is investigating the dissemination of its data using some of these standards.

Thanks for your attention

Any questions?

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