# Citizen Science on the Three Mile Water and Glas-na-Bradan

## Citizen Science for Restoration

## Greenmount Campus

## 25th Nov 2017

Queen's University Belfast

# Rivers and Restoration

- Why do we need science for restoration?
- Widespread restoration efforts across NI.
- Is this appropriate?
- …..if your car broke down a respray would not get it going again!

Image: Warrington car respray

# Put another way……

- If we need to restore, we have a disturbance to fix.
- ….but what is the cause(s)?
- It may be related to
  - Hydromorphology
  - Biological
  - Flow
  - Water Quality


Images: Daily mail

# Water Quality and Flow- Often neglected

- Looking at this another way, there is no point in restoring a river when the sources of pollution that cause degradation are still there.

Photos: Irish Times

# Science Behind Restoration

- To restore rivers, we need to know source(s) of problems
- We also need to establish restoration targets
- To do this we need data.
- In an ideal world, environmental scientists and engineers would like to know

  ….everything

  …about everywhere

  …all of the time.
- This is impossible, so we must make do with less.

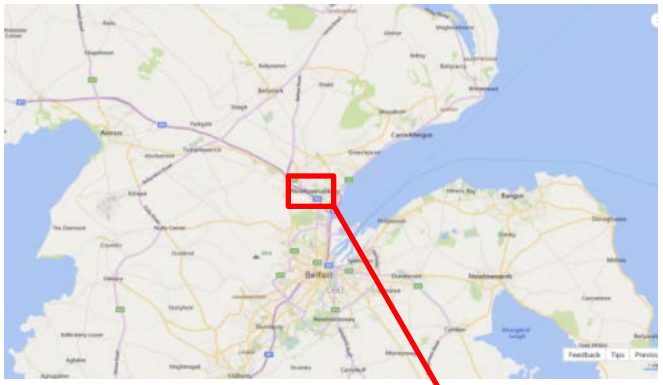
Images: Plymouth State University

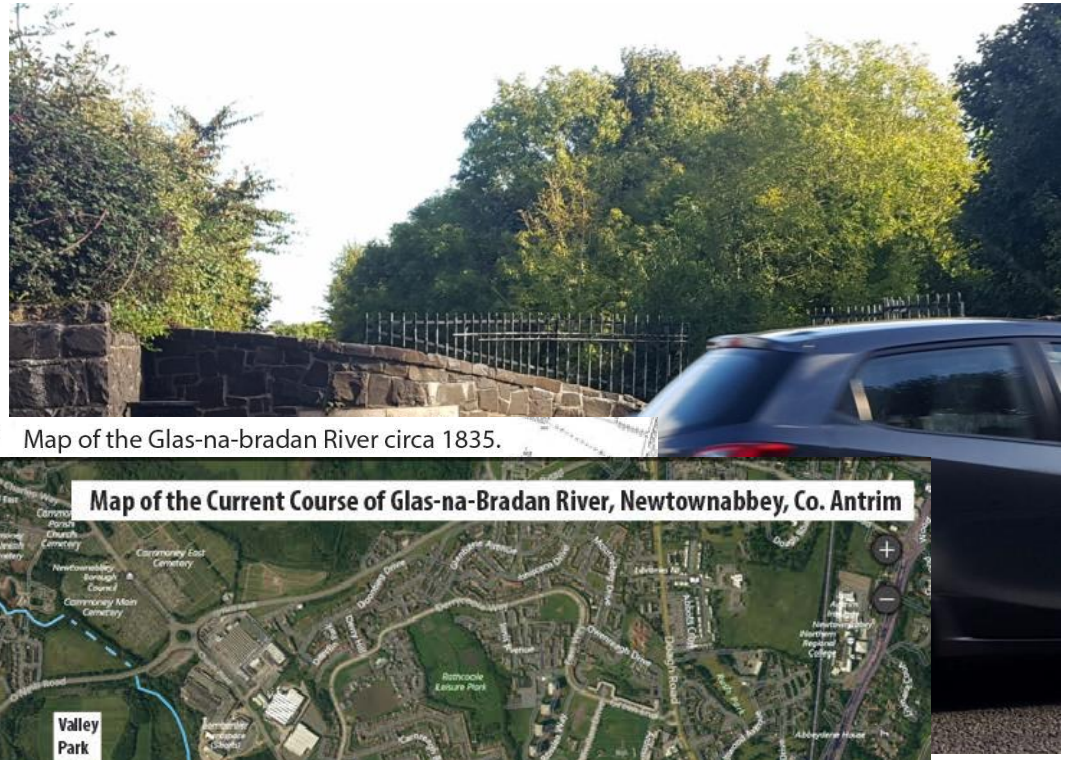
# Where Citizen Science Helps

- Many measurements are easily made and inexpensive (but very important).
- Citizen science allows for regular reliable data collection.
- This helps to better understand processes operating in a river.
- Also considerable local knowledge (including historical information & community contacts)
- Often overlook sources of expertise

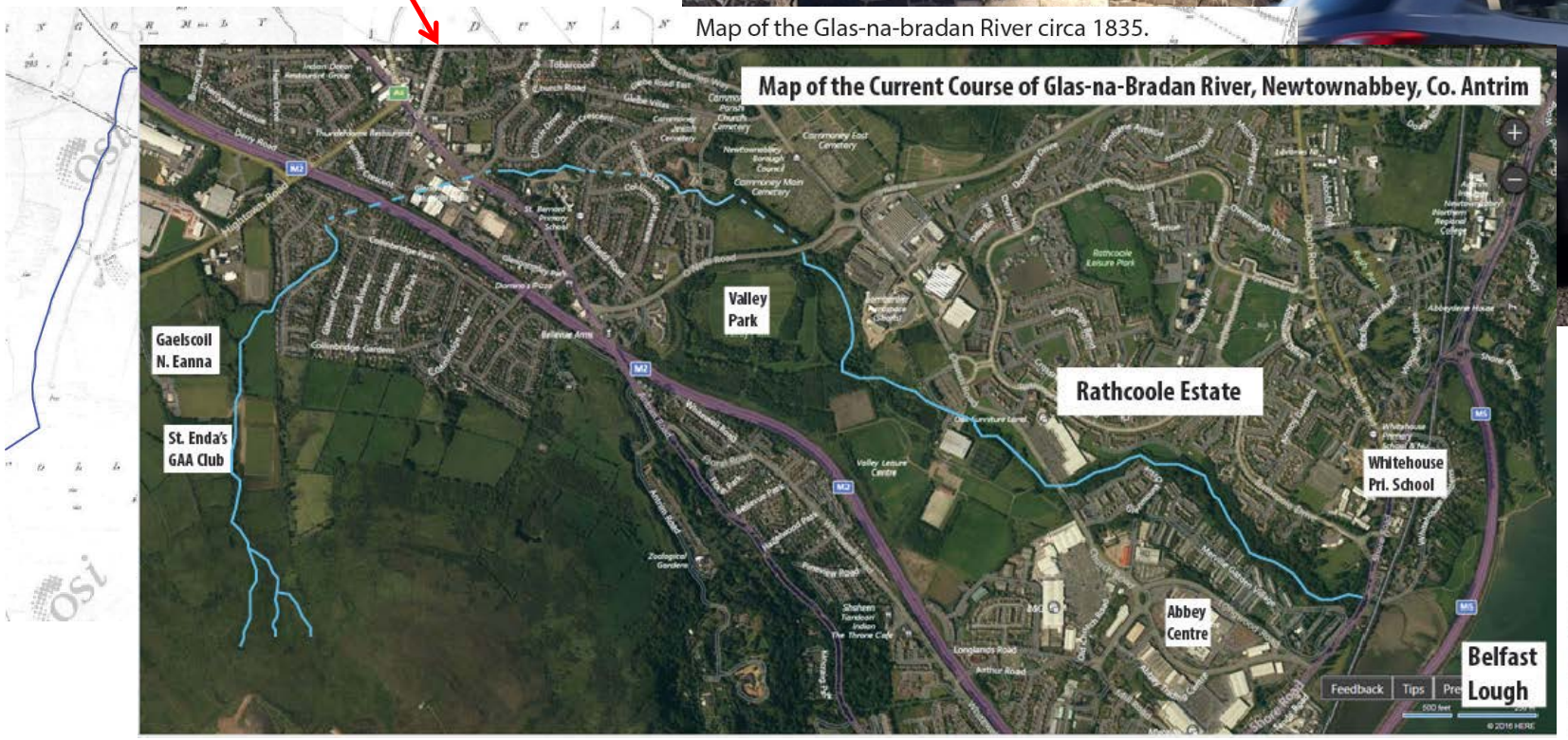
Image: Cliparthut.com

# Glasnabradan – A Case Study





Map of the Glas-na-bradan River circa 1835.



# Approach to Citizen Science

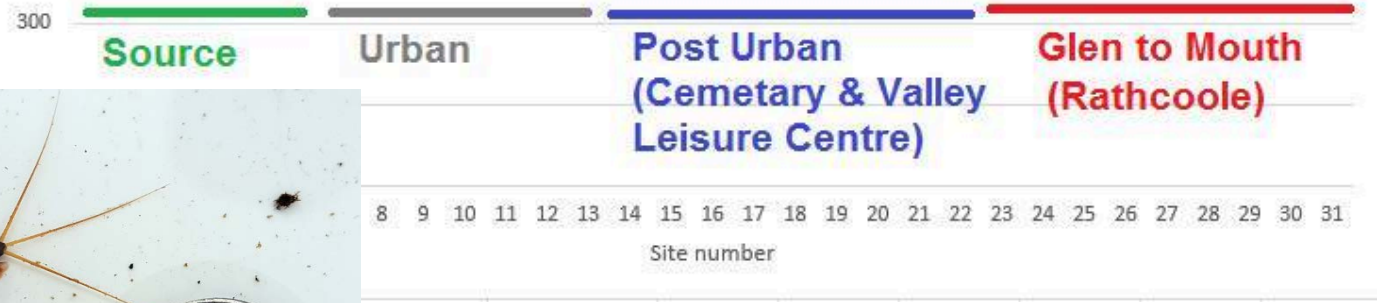
How?
Collaborative effort with NIEA in which we shared data in a joint effort to better understand how pollution occurs, its impact and the best means to tackle it.

Taking a multidisciplinary approach:
Community involvement and Science

- Water Quality
- Hydrology & Civil Engineering
- Ecological monitoring
- Geographical Information Systems (GIS)

- Hydropmorphology –not bad
- Flow OK ?
- Localised invasive issues

# Water Quality and Ecology


# Issues with Water Quality

- Some quality aspects very visible; much is not.
- Critical questions:
- How is it happening?
- Where is it happening?
- When does it occur?
- What does it do?

# Further Results

# Achievement from Simple Stream Survey

- Identification of key pollution point sources along the river.
- ….principally misconnects.
- Significant leakage of tap water (distribution loss) discharged to river via pipes.
- Survey results provided to NIEA.
- Source of main disconnects identified and being repaired.
- Identified stretches of concern for more detailed investigation by specialists.

Example of pollution Hotspot

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NIEA www.daera-ni.gov.uk | Northern Ireland Environment Agency

# Where to from here?

Citizen Science Approach works!

Measurements proved reliable and inexpensive

…..yet very useful for understanding pollution sources

….and identifying pollution hotspots

Needs to be done in systematic manner (not a witch hunt!)

Is there a desire to do this elsewhere?

Please let us know –during  the workshop.