

A local study of weather indices from Wales



Richard Wilson c.1760 'Snowdon from Llyn Nantlle'
Image cannot be shared, but may be viewed here:

<http://www.liverpoolmuseums.org.uk/walker/collections/paintings/18c/item-238269.aspx>

Jones C.A.¹, Grady D.A.I.¹, Davies S.J.¹, and Macdonald N.²

¹Department of Geography & Earth Sciences, Aberystwyth University, Wales, SY23 3DB (eyj@aber.ac.uk)

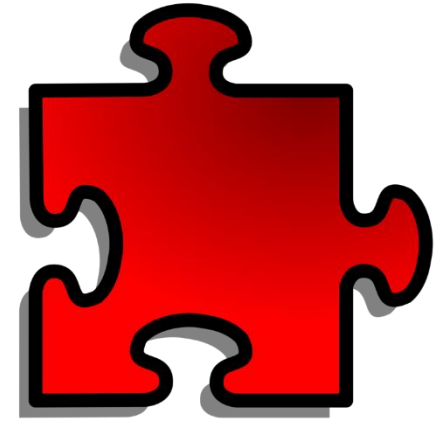
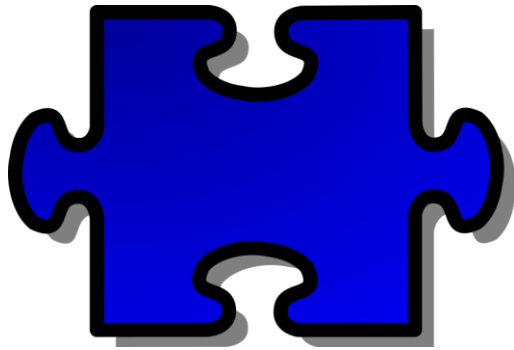
²Department of Geography, The University of Liverpool, Liverpool, UK, L69 7ZT (Neil.Macdonald@liv.ac.uk)

Sources

- The use of documentary sources to investigate past climate variability has been widely applied in a variety of contexts
- The potential of a variety of documentary sources in Wales has remained largely undiscovered

Sources

- The use of documentary sources to investigate past climate variability has been widely applied in a variety of contexts
- The potential of a variety of documentary sources in Wales has remained largely undiscovered



CHERISH

*Newid Hinsawdd a Threftadaeth yr Arfordir
Climate Change and Coastal Heritage
Athru Aeráide agus Oidhreacht Chultúrtha*

Sources

- The use of documentary sources to investigate past climate variability has been widely applied in a variety of contexts
- The potential of a variety of documentary sources in Wales has remained largely undiscovered
- Case studies:
 - 20th Century:
 - Rainfall 1976, 1988
 - Snowfall 1947
 - Personal agricultural diaries
 - 19th Century:
 - Flood events 1870-1900
 - Newspapers
 - Venables diaries
 - 18th Century:
 - Bulkeley diaries

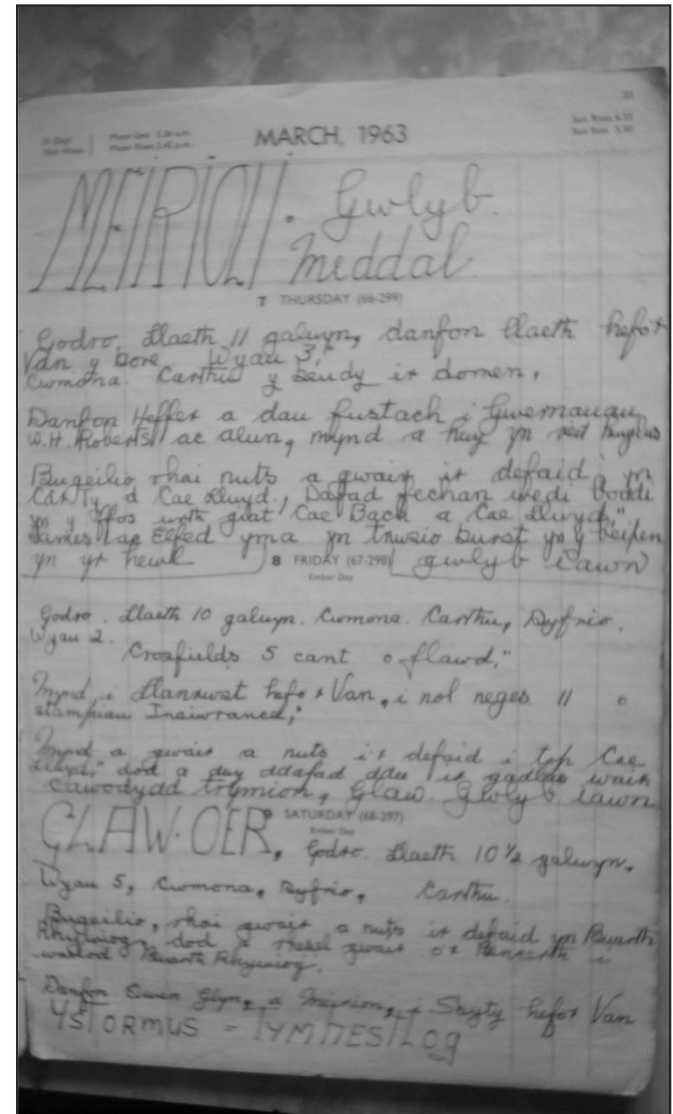
20th Century: Rain, Snow and Agriculture

- Over 40% lies above 250 m, with >70% of NW Wales above this contour
- Steep temperature and precipitation gradients present due to relief
- >80% of welsh land is classed as 'less favourable' under EU guidelines.



20th Century: Rain, Snow and Agriculture

- Numerous farmers have kept weather diaries, a valuable resource, but often difficult to obtain or locate
- These highly personal accounts, however, can illustrate the emotional, social and practical responses to weather extremes
- These sources potentially provide a greater depth and individual narrative to the evidence gleaned from official sources, such as estate records and Board of Agriculture archives



20th Century: Rain, Snow and Agriculture

Macdonald et al. (2010) *Weather*

English–Welsh weather dictionary (with regional dialects/variants), compiled using Geiriadur Prifysgol Cymru at www.aber.ac.uk/geiriadur

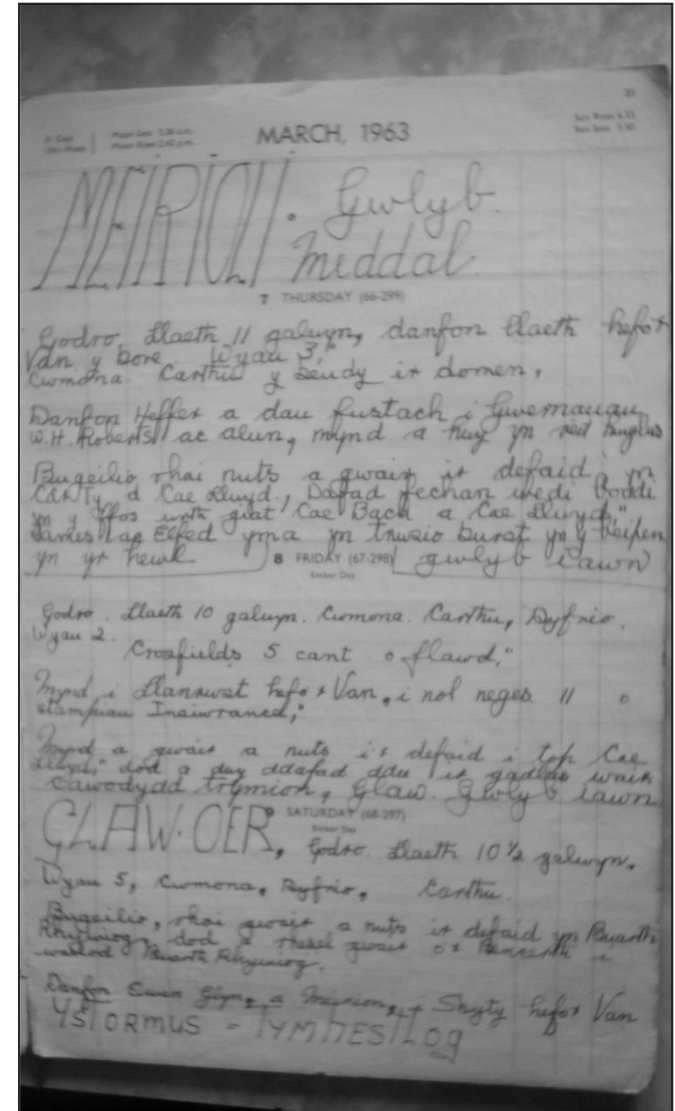
Lightning (to flash)	Ffleimfelt, bwrw golau, fflachiad mellten, gwreichioni mellt, llethrid, lluchedu, lluchedennu, meltennu, melt(i)o, meltu, saethu mellt, tafu golau, tafu tân, taranfolt(i)o
	Sheet lightning (unaccompanied by thunder) Awyrdraig, draig, planedo
	Flash of lightning llucheden, lluch(i)aden, llecheden, lluchedeniad, lluchediad, maen cawod (cawad), meltt, meltten, myllt, melttenaid, meltluched, post
Rain	Glaw, glawogydd, adlaw, cawod, cawad, cafod, cymunlaw
	Begin to rain tafu dafnau
	To rain and blow a high wind at the same time Chwiiwio bwrw
	Hail/snow with rain Ceseirlaw [hail], glaw eira [snow]
	April rain Glaw tyfu
	Brew for rain ceulo am law
	Early rain/first rain cynharlaw, cynnar-law
	Likely to rain clafaidd
	Rain drops clych glaw, dafnau glaw, dagr, degryn, deigr, glaw bras [large]
	Heavy downpour of rain Arllwys (y glaw), diffwys, diffwyster, diwel y glaw, diwelaf, diwin, glaw gochel, glaw gyrru, glaw tyrfau, glaw tarannau, hirlaw, horslaw, hyrddlaw, llyfreirlaw, pelt(i)o, pistyll(i)o, pistyllu, pistyllian, rhuthrlaw, curin, curing, cyrin, curlaw, curlawiog, glaw gyrru, glaw 'Stiniog (Ffestiniog), yn ei dymchwel hi pis(i)o bwrw (glaw), ponlaw, rhyslaw, slasio bwrw (glaw), stid(i)o bwrw/glawio, tatsio, tatsian, tresio, tresian bwrw (glaw), bwrw hen wragedd a ffyn (cats and dogs), bwrw cylllyl a ffyr(s)
	Gentle/drizzling rain gw lith(i)o, gw lithen, gw lithgawod, gw lithgawad, gw lithlaw, ffrechan, ffrechen, lleithrin [weather], lleith-hin [weather], pigo, pigan, pigach, sgip, smitlaw, briwlaw, glaw mân, glaw smwc, glaw mynydd (on highlands), manlaw, mân law, piglaw
	Abundance of rain Hidlaidd, hilaidd
	Steady rain gwastadlaw
	Layer of frozen rain glâsrew
	Frozen rain glaw iâ
Rainbow	Bwa, bwa enfys, bwa'r glaw, bwa'r cyfamod, bwa'r Drindod, bwa'r hin, bwa'r wrach, bwa'r wybren
	Partial rainbow Cyw drycin
Sleet	Eirlaw, glaw eira, glaweir, llifeirlaw, odlaw, slap, slot eira
	(to) sleet Odi
Snow	Eira, eiraf, eiry, nyf, Briwod (fine-driven), cribod (surface), cyrneiry (first fall of), ffluwch, ffloch, gwyneiry, gwynneiry (white/blessed), manod (fine-driven), nithod (fine), ôd, odi, odif
	Snowflake Casnod, casna(d)d, clwyden o eira, fflochen, ffloch, hiff, hyff, ôd, tafell
	Snowball Caseg eira, mopen, pêl eira, plu(f) eira
	Snow-drift heod, lluch, lluchfa, lluchiad, lluwch, lluwchyn, llywch, lluwchfa, llochfa, lluwchiad
	Rain mingled with snow Glaw eira
Spring	Cyntefin, eilir, gwanwyn, gwaeawyn, gwanhwyn, sbring, ysbring
	Spring fallow braenar gwanwyn, branar gwanwyn, brynar gwanwyn

(Continued)

20th Century: Rain, Snow and Agriculture

Macdonald et al. (2010) *Weather*

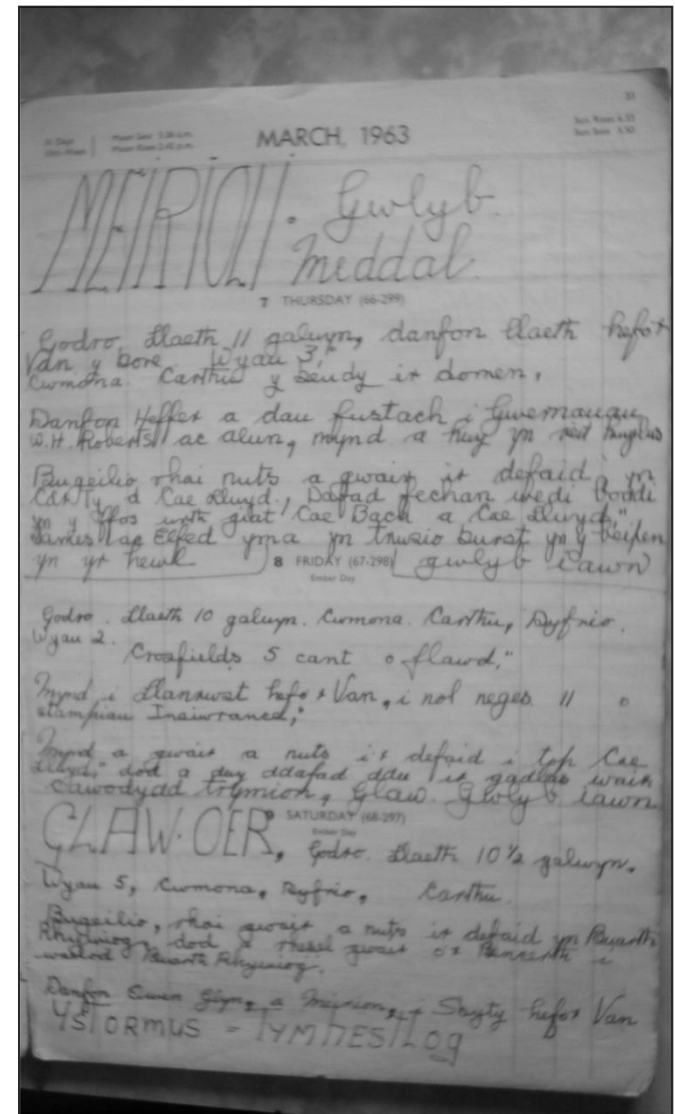
- Diaries of D.O. Jones (1934–2000)
- Ysbyty Ifan (northwest Wales)
- Daily descriptions
- Welsh, with some English

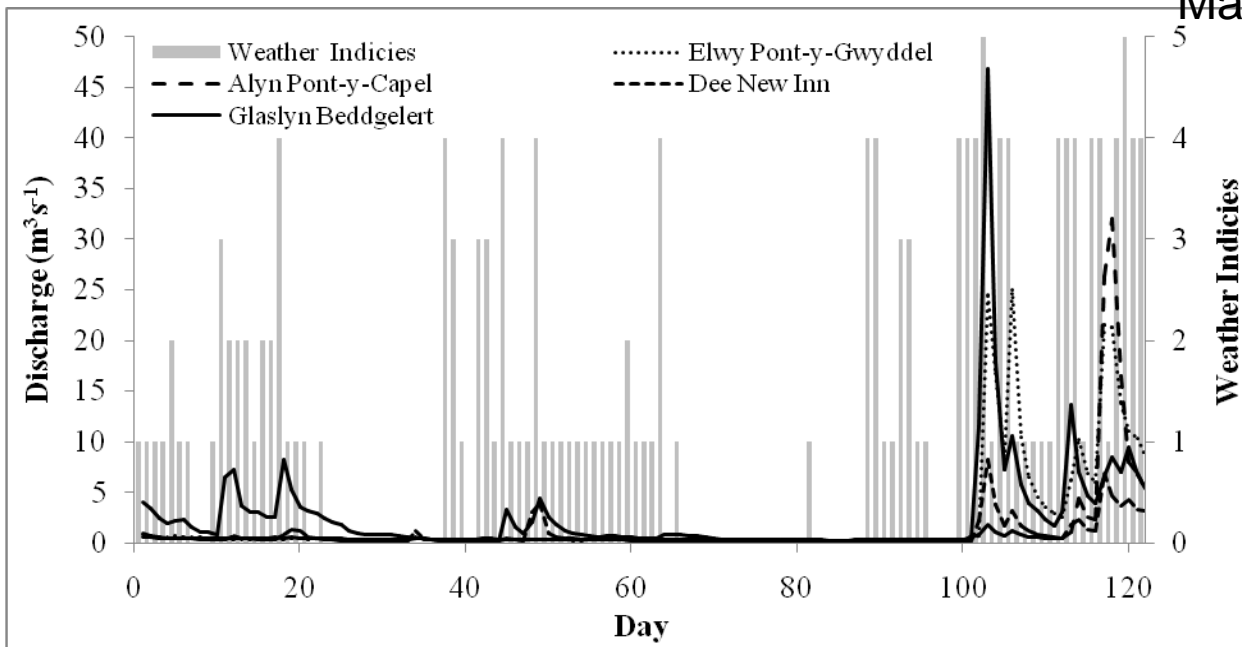


20th Century: Rain, Snow and Agriculture

Macdonald et al. (2010) *Weather*

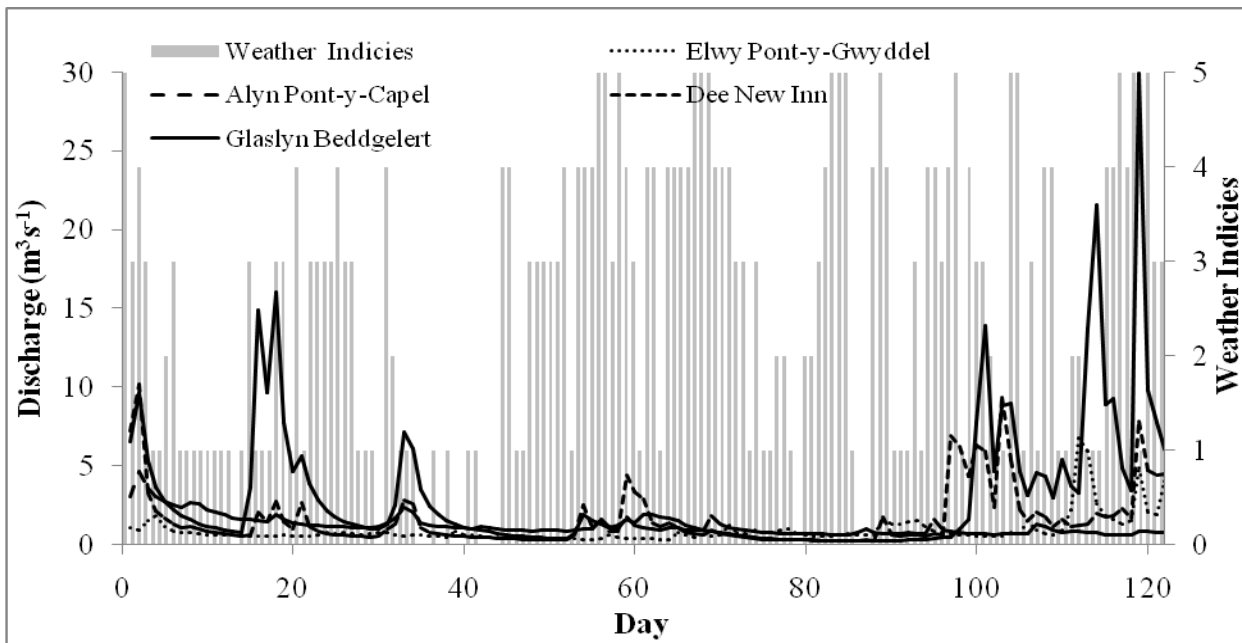
Weather indices (the numerical range applied in Figures 3 and 4).	
Weather type	Indices value
Drought / Hot	0
Dry / Fair / Close	1
Drizzle / Foggy	2
Showers	3
Rain / Wet	4
Storm	5





Relationship between weather indices and regional river discharge (dry)

(1st June – 30 September, 1976)



Relationship between weather indices and regional river discharge (wet)

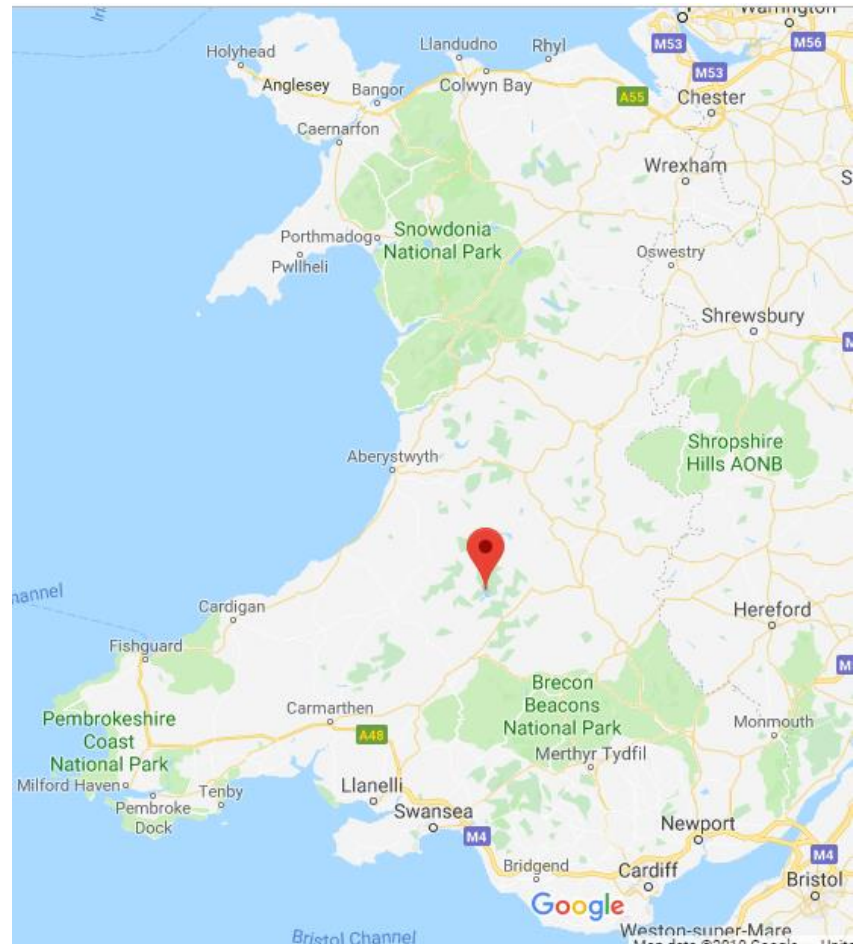
(1st June – 30 September, 1988)

Summer storms recorded as significant to farmers, but short in duration

20th Century: Rain, Snow and Agriculture

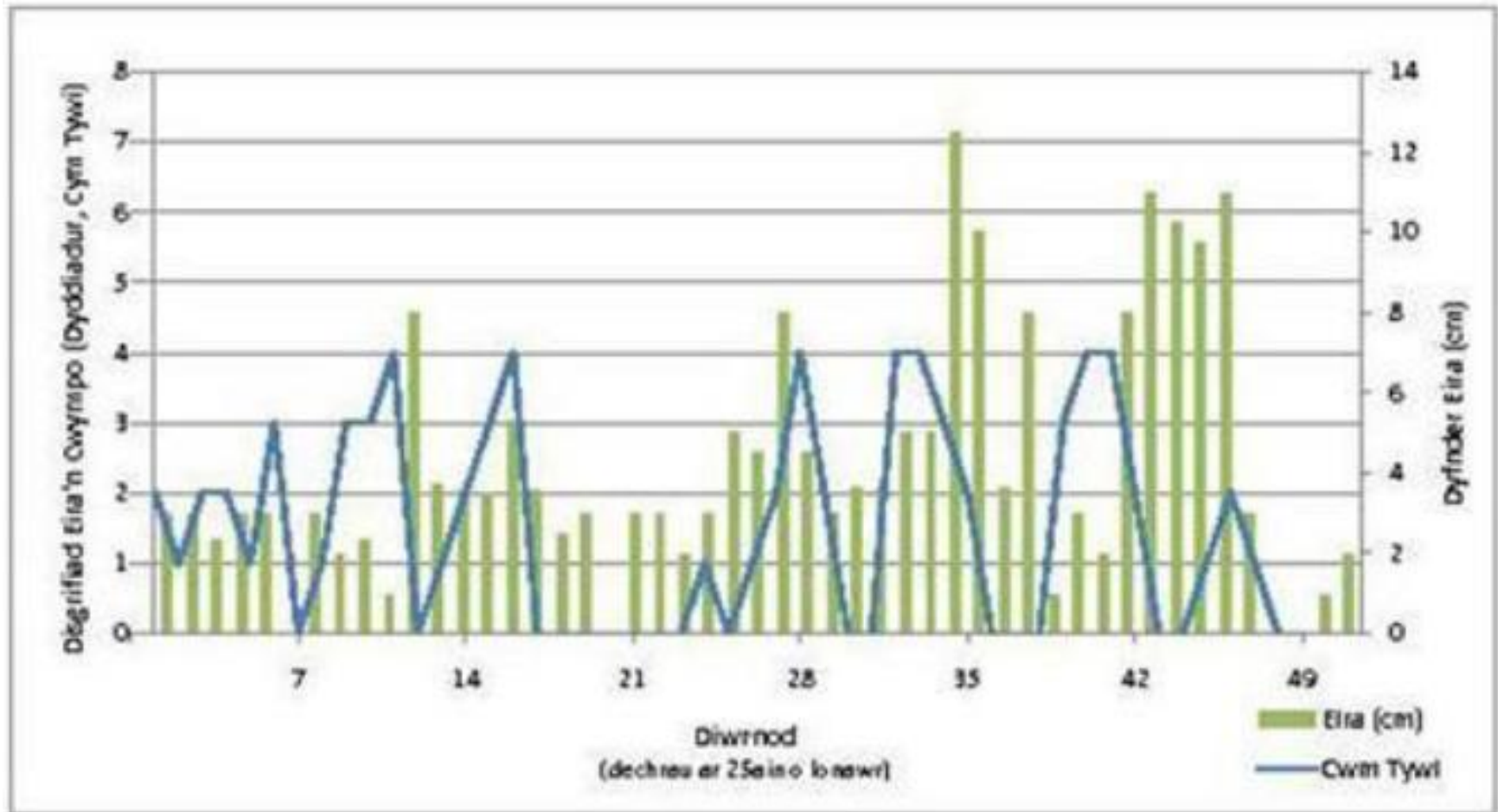
Jones et al. (2010) *Gwerddon*

Cod	Disgrifiad
0	Dadmer / Dim sôn am eira
1	Eira ysgafn
2	Cawodydd o eira
3	Eira trwm
4	Storm eira / lluwchfeydd



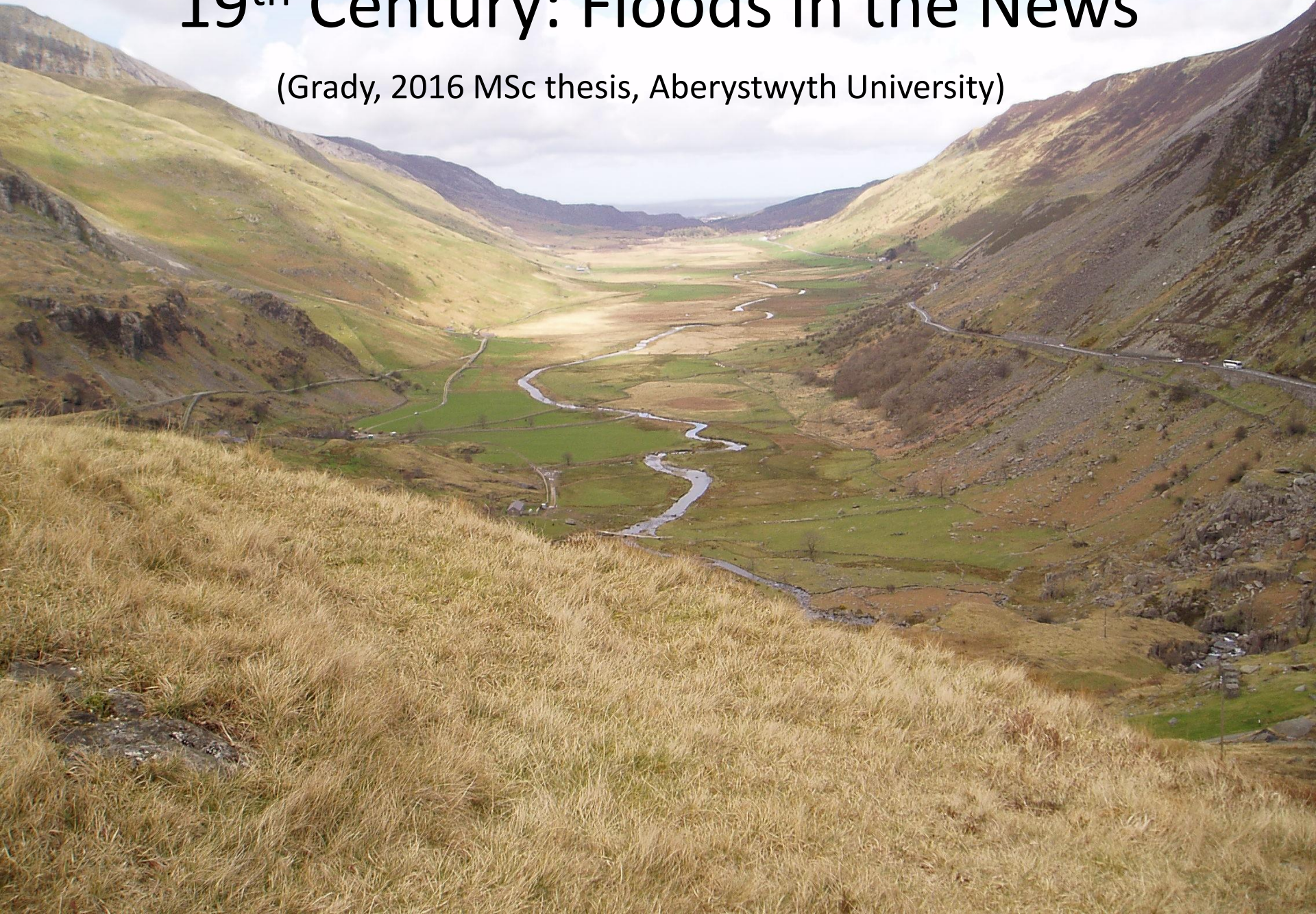
20th Century: Rain, Snow and Agriculture

Jones et al. (2010) *Gwerddon*



19th Century: Floods in the News

(Grady, 2016 MSc thesis, Aberystwyth University)



19th Century: Floods in the News

(Grady, 2016 MSc thesis, Aberystwyth University)

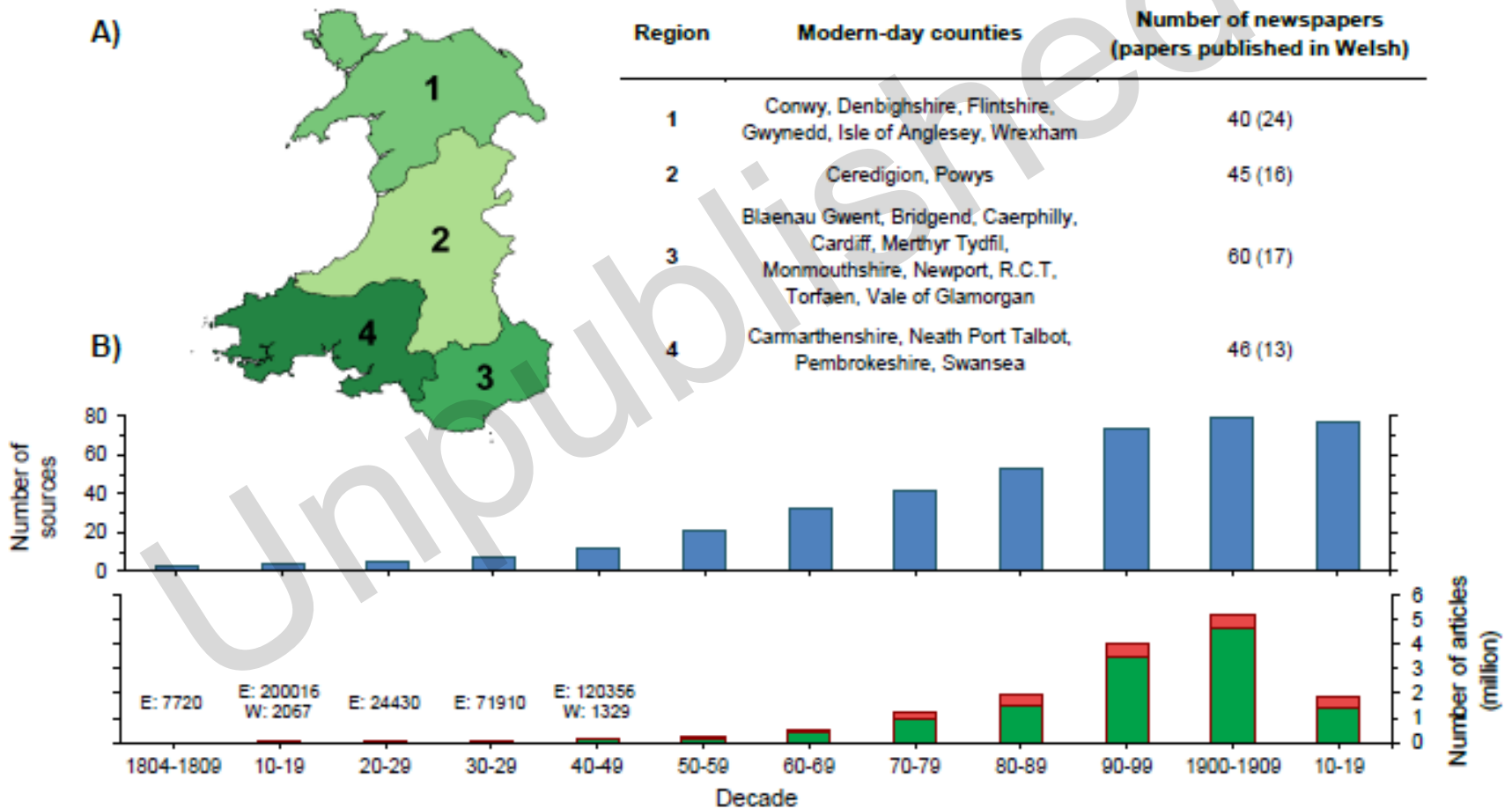


Figure 1.3 | (A) Archive regions of Wales as defined by the NLW (2016b), and (B) the number of newspaper articles and sources within the WNO archive. Created using shapefiles from DIVA-GIS (2016) in QGIS (v. 2.8.9). Table of region characteristics using individual region data found in NLW (2016b) for 1804-1919, with modern counties within each region from the Local Government (Wales) Act (1994). The number of newspaper articles in both English (E; green) and Welsh (W; red) and total number of newspaper sources were extracted from NLW (2016b).

19th Century: Floods in the News

(Grady, 2016 MSc thesis, Aberystwyth University)

The screenshot shows the Welsh Newspapers Online (WNO) search results page. The header includes the logo for 'LLYFRGELL GENEDLAETHOL CYMRU THE NATIONAL LIBRARY OF WALES' and the word 'Cymraeg'. A search bar contains the text 'Search all newspapers'. Below the header, the page title is 'Welsh Newspapers Online' with a subtitle 'Discover 15 million articles and 1.1 million pages'. The search results section shows 'Viewing 1 - 12 of 28,368 results for flood'. The results are displayed in a table with columns for Newspaper Title, Date, and Word Count. The first result is from 'The South Wales Daily Post' dated 26th June 1893, titled 'THE FLOOD! THE FLOOD!'. The second result is from 'The Montgomery County Times and Shropshire and Mid-Wales...' dated 27th January 1894, also titled 'THE FLOOD! THE FLOOD!'. The third result is from 'Evening Express (Fourth Edition)' dated 31st March 1894, titled 'The Flood'. The fourth result is from 'Evening Express (Special Edition)' dated 31st March 1894, also titled 'The Flood'. A sidebar on the left contains filters for Newspaper Title, Category, Decade, Year, Month, Day, Language, Region, Illustration Type, and Copyright.

Newspaper Title	Date	Page	Word Count
The South Wales Daily Post	26th June 1893	p.3	266 words
The Montgomery County Times and Shropshire and Mid-Wales...	27th January 1894	p.7	265 words
Evening Express (Fourth Edition)	31st March 1894	p.4	2,334 words
Evening Express (Special Edition)	31st March 1894	p.4	2,152 words

Figure 5.2 | Example page of the main search page within the WNO database following a search for the word 'flood' between 1870 and 1900 (NLW, 2016b).

19th Century: Floods in the News

(Grady, 2016 MSc thesis, Aberystwyth University)

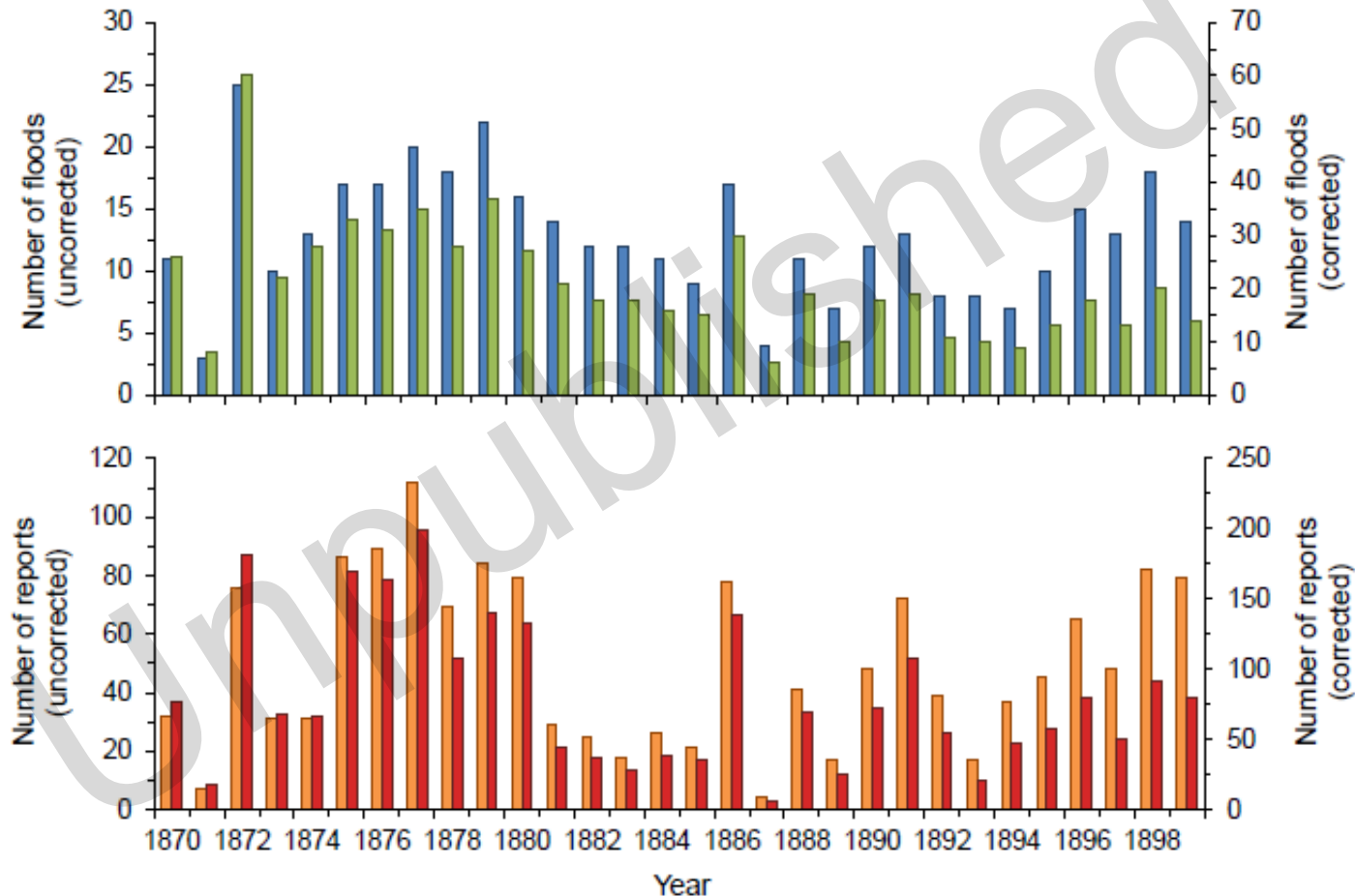


Figure 6.1 | Number of individual flood events (top) and number of reports of flooding (bottom) uncorrected (blue and orange) and corrected (green and red) using Equation 1 across the study period.

19th Century: Floods in the News

(Grady, 2016 MSc thesis, Aberystwyth University)

Table 5.2 | Significance matrix for assessing the impacts of flooding events in Wales.

† See Figure 5.3 for full interpretation of these regions extent.

	Significance score		
	1	2	3
<i>Extent</i> [†]	Isolated event (Affects few people – confined to 1-3 nearby localities within 1 region or extends across in cases with towns straddling a border)	Regional/local event (Affects <1% of people – extends across 1-5 neighbouring regions within a maximum of 2 greater regions)	Multi-region/National coverage (Affects many/most people – over 5 regions or impacts across multiple non-neighbouring regions/greater regions)
<i>Severity</i>	Unusual weather Limited affect on health/local functioning Mild inconvenience caused	Considerable damage Significant injuries Working days lost	Loss of human life Loss of basic services Complete destruction Stranded/rescue required
<i>Duration</i>	Impact confined to a single day	Impact lasts 1-3 days	Impact is prolonged (>3 days)

19th Century: Floods in the News

(Grady, 2016 MSc thesis, Aberystwyth University)

Brook overflows its banks blocking a nearby road, for one day, with no human injuries caused:

Significance score = 1 (Extent) x 1 (Severity) x 1 (Duration) = **1 (low)**

Heavy rainfall across most of Wales, causing widespread flood events with substantial damage to property and businesses, over the course of a week:

Significance score = 3 (Extent) x 2 (Severity) x 3 (Duration) = **18 (high)**

19th Century: Floods in the News

(Grady, 2016 MSc thesis, Aberystwyth University)

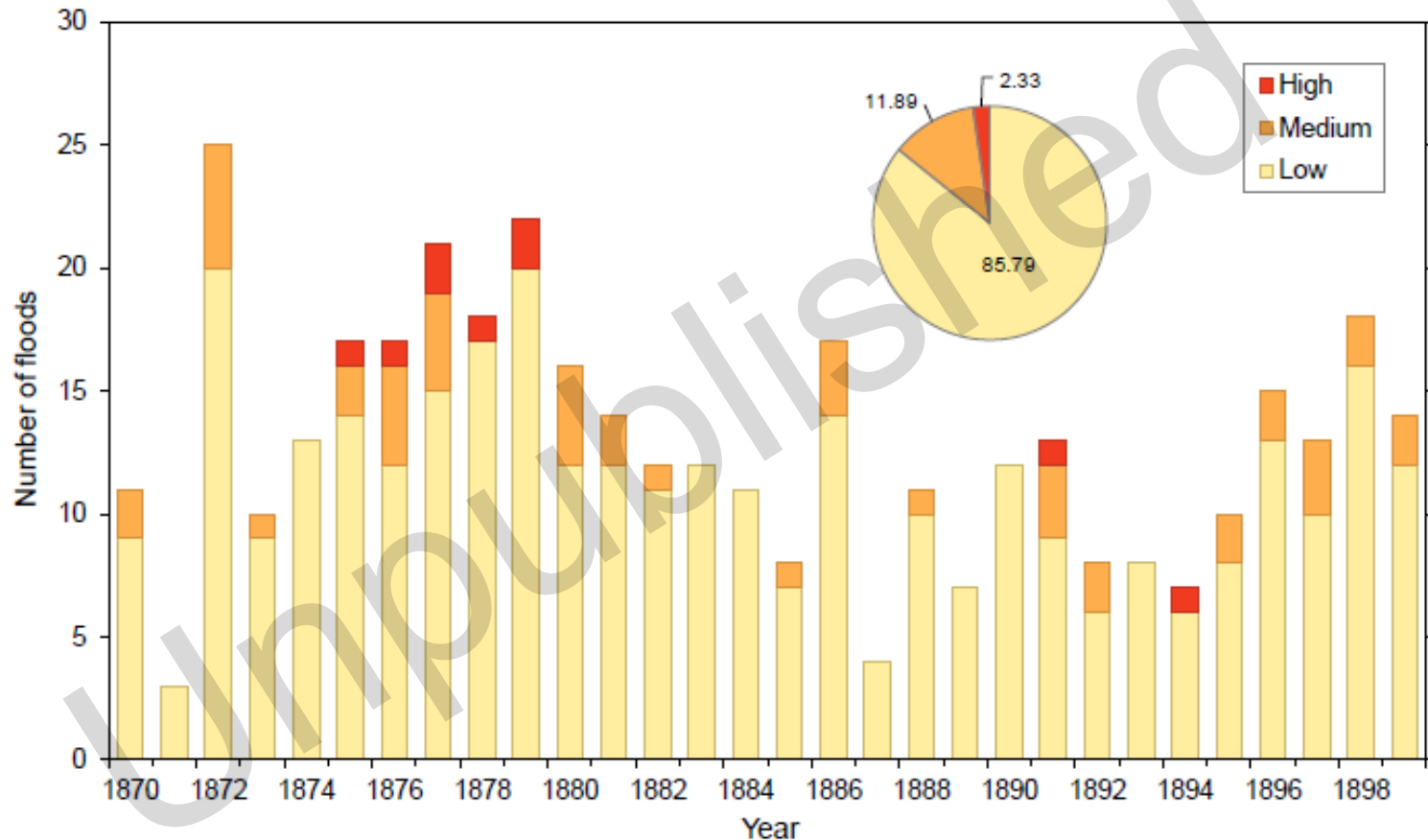


Figure 6.3 | Number of low, medium and high significance flood events per year, with the fraction of low, medium and high events for the entire study period (1870-1900) displayed by the inset chart. Refer to the inset legend for full interpretation of the colour classification for low, medium and high significance events.

TEMPEST – Tracking Extremes of Meteorological Phenomena Experienced in Space and Time

Extreme Weather in the UK
 The TEMPEST Database

The Database
Search
Results
Mapped Results
Help

There are 13 records of events which match your search criteria. Summary details of the records are listed chronologically below.

Records of events are shown as the date and location(s) of the event, the class mark of the document in which the event is recorded and the repository which holds the document. If known, the author of the document will also be listed. Clicking on the date will trigger a pop up window with full details of the event. Clicking on the classmark gives more information about the document itself. Clicking on the author gives biographical information about that individual.

Any locations listed with records of events are shown as markers on the map displayed in the [Mapped Results](#) tab.

Record 1
 Event recorded - 1714 at Sherwood Forest
 Document - 'DD/FJ/10/9/7/27' in repository Nottinghamshire Archives
 Author - [William Lowndy](#)

Record 2
 Event recorded - 1714 at Sherwood Forest
 Document - 'DD/FJ/10/9/7/29' in repository Nottinghamshire Archives
 Author - [Thomas Hewett](#)

Record 3
 Event recorded - 1714 at Sherwood Forest
 Document - 'DD/FJ/10/9/7/30' in repository Nottinghamshire Archives
 Author - [Thomas Hewett](#)

Record 4
 Event recorded - 1714 at Sherwood Forest
 Document - 'DD/FJ/10/9/7/31' in repository Nottinghamshire Archives
 Author - [Thomas Hewett](#)

Record 5
 Event recorded - 1st February 1714 at Norfolk
 Document - 'MC 64/11' in repository Norfolk Record Office
 Author - [Charles Boardman Jewson](#)

Record 6
 Event recorded - 1st February 1714 at Old Bolingbroke (Formerly Bolingbroke)
 Document - 'OLD BOLINGBROKE PAR/1/2' in repository Lincolnshire Archives
 Author - [Old Bolingbroke parish authorities](#)

Extreme Weather in the UK
 The TEMPEST Database

The Database
Search
Results
Mapped Results
Help

Arts & Humanities
Research Council

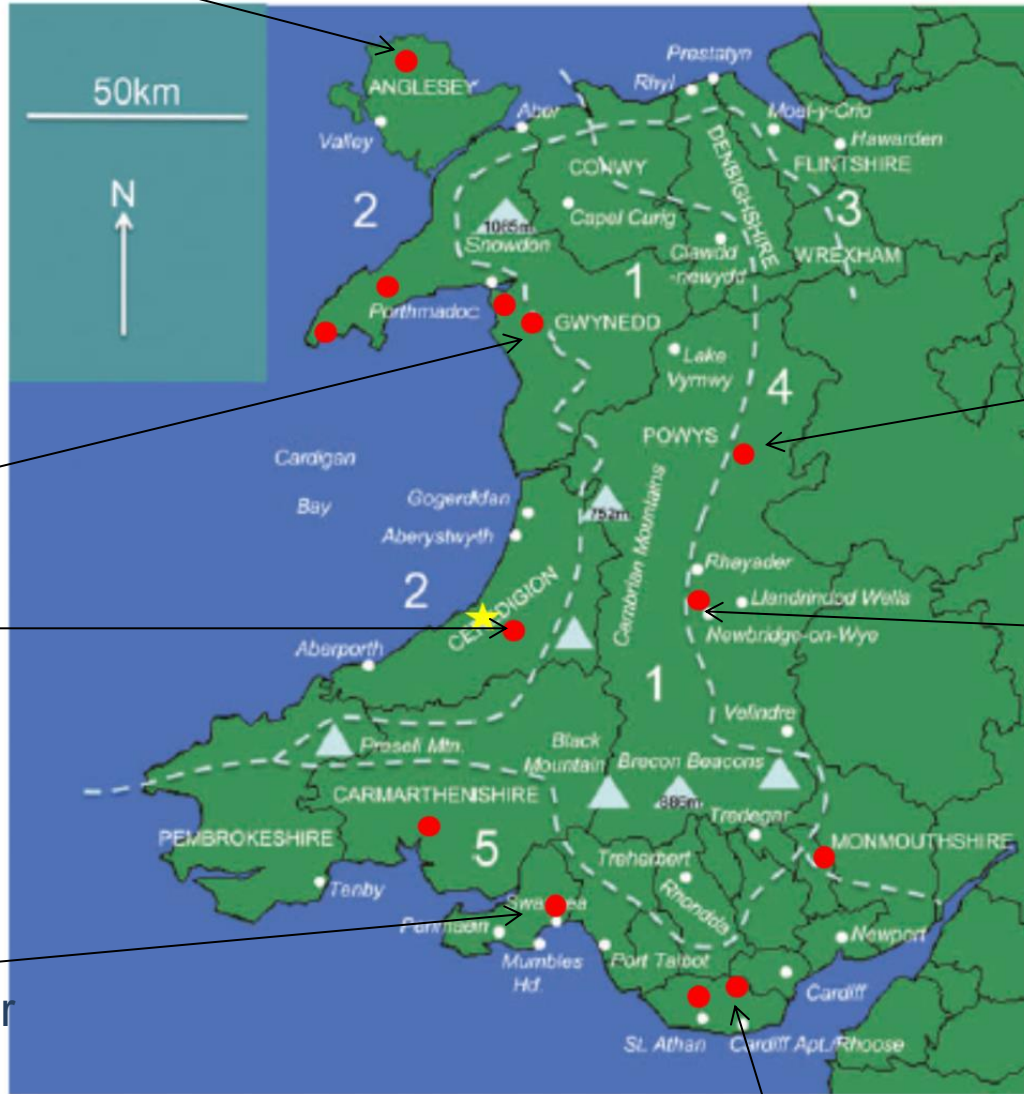
The University of
Nottingham

PRIFYSGOL
ABERYSTWYTH
UNIVERSITY

University
of Glasgow

UNIVERSITY OF
LIVERPOOL

Bulkeley, Llanfechell
1734-1760



Davies, Manafon
1797-1846

Jones, Trawsfynydd
1872-1919

Jenkins, Trecefel
1839-1947

Venables, Llysdimam
1809-1893

Dillwyn, Penlle'r-gaer
1817-1852

Thomas, Michaelston-Super-Ely
1762-1795

Llysdinam Estate, Newbridge on Wye



Diaries of Richard Venables (1808-1857), **Richard Lister Venables** (1828-1893), George Stovin Venables (1828-1883), Mary Hannah Venables (1809, 1813, 1820, 1834)



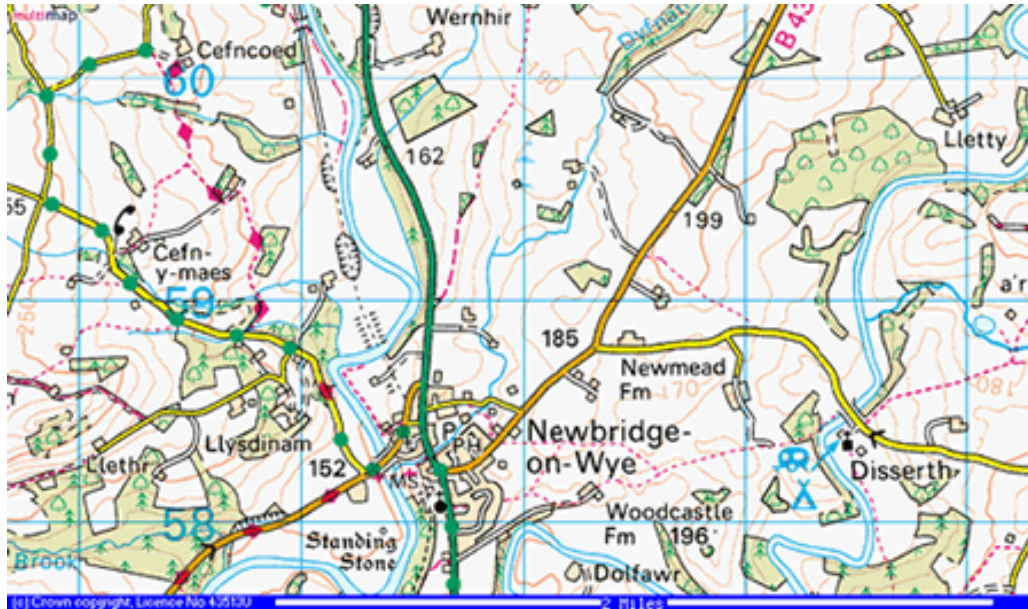
Richard Lister Venables (1809-1894)



[Painting by Lowes Cato Dickinson, 1871 - original at the Judges Lodging, Presteigne.](#)
Distributed under a CC BY-NC-SA 4.0 licence



Image of a Llysdimam diary. Image cannot be shared because of copyright restrictions.



November 11th 1878

*'...the flood has made the bridge over the Wye at Whitney impassable and the traffic between Hay and Hereford is stopped... **All the people about Newbridge seemed to agree that the Wye yesterday was higher than had been since the bridge was taken down in Nov 1831. The Ithon they said had never been so high. I went after even^s. I suppose it had fallen. It was over the field at Woodcastle and Dol(fawr) but I believe it had been as high in July 1875...***

Clyro, March 14th 1867: RLV to GV



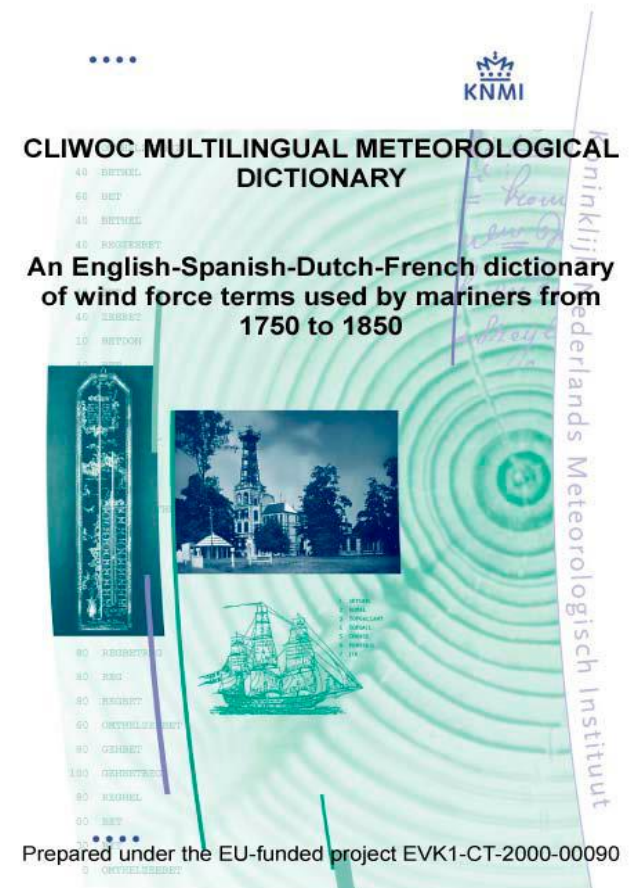
Image of a Llysdinam diary. Image cannot be shared because of copyright restrictions.

“I have now 10 inches of level snow in front of the windows. It is snowing heavily at 1.30pm... the therm is about 30°”



Llysdinam Hall
<http://powysenc.weebly.com/venables---visdelou.html>

Beaufort number	Description	Wind speed	Land condition
0	Calm	< 1.1 km/h	Calm. Smoke rises vertically.
1	Light air	1.1–5.5 km/h	Smoke drift indicates wind direction. Leaves and wind vanes are stationary.
2	Light breeze	5.5–11.9 km/h	Wind felt on exposed skin. Leaves rustle. Wind vanes begin to move.
3	Gentle breeze	11.9–19.7 km/h	Leaves and small twigs constantly moving, light flags extended.
4	Moderate breeze	19.7–28.7 km/h	Dust and loose paper raised. Small branches begin to move.
5	Fresh breeze	28.7–38.8 km/h	Branches of a moderate size move. Small trees in leaf begin to sway.
6	Strong breeze	38.8–49.9 km/h	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult. Empty plastic bins tip over.
7	Near gale	49.9–61.8 km/h	Whole trees in motion. Effort needed to walk against the wind.
8	Gale	61.8–74.6 km/h	Some twigs broken from trees. Cars veer on road. Progress on foot is seriously impeded.
9	Strong gale	74.6–88.1 km/h	Some branches break off trees, and some small trees blow over. Construction/temporary signs and barricades blow over.
10	Storm	88.1–102.4 km/h	Trees are broken off or uprooted, structural damage likely.
11	Violent storm	102.4–117.4 km/h	Widespread vegetation and structural damage likely.
12	Hurricane force	≥ 117.4 km/h	Severe widespread damage to vegetation and structures. Debris and unsecured objects are hurled about.



Terminology used to identify High wind events

Lower spectrum

Key words:

Gale	Blows strong
Fresh gale	Heavy gale
Strong wind	Strong gale
High wind	Violent gale
Violent wind	Strong gusts
Heavy wind	Very high wind
Strong gale	High gale
Storm	Stiff Gale

Any description of:

Small trees blown down
Structural damage
Chimney pots removed
Winds between 61.8-88.1km/h

Higher spectrum

Key words:

Blows hard	Violent storm
Hard gale	Tremendous gale
Whole gale	Tremendous wind
Tempest	Very high gale
Furious storm	

Any description of:

Uprooted trees
Important structural damage
Widespread damage
Winds between 88.1-117.4km/h

Exceptional

Key words:

Hurricane
Typhoon

Any description of:

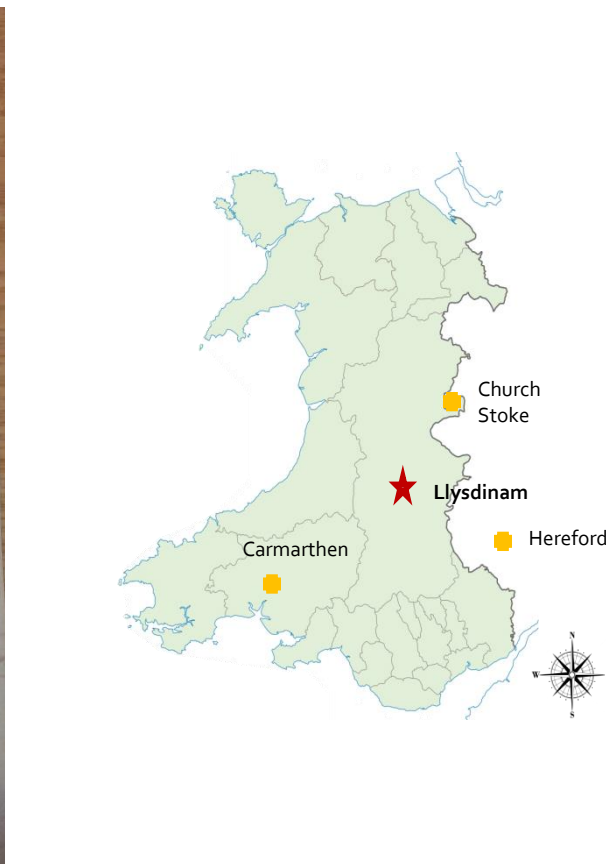
Widespread damage and devastated countrysides
Winds over 117.4km/h

*14 October 1881 – S.W. **Furious storm** continuing. Great destruction of trees all over England. **Several blown down here.** [...] Much mischief done by the gale. Two handsome oaks across the drive within 80 yds of the house [...]*

Richard Lister Venables diary entry	Equivalent Beaufort scale	On 4 pt. scale (0-3)
January 24, 1840 <i>Most remarkable & Tremendous storm of wind S.W. and rain. Wind abated about 1P.M. rain wh[ich] was most violent abated about 2P.M. very high floods in Wye & Ithon at the greatest height of 4P.M. hail at night</i>	11 – Violent storm	3
June 7, 1843 <i>W. Sends of rain Heavy rain at night and high wind</i>	8 - Gale	2
September 15, 1847 <i>W. Fine . cool & cloudy P.M. Tremendous gale at night</i>	11 – Violent storm	3

*Triangulated with instrumental data from Churchstoke weather station
1876-1893*

METEOROLOGICAL SOCIETY.														Height of station of barometer above sea level 550 feet.							
Meteological Observations taken at Churchstoke, during October, 1881.														Latitude 52 31 N		Bar. Gauge		on ground		on 6 in.	
Day of the Month	Hour of the Day	Temperature						Wind	Cloud	Weather	Rain	Barometer			Thermometer			Remarks	Remarks in sun.		
		Air	Shade	Soil	Water	Wet Bulb	Wet Bulb					At	At	At	At	At	At				
1	65	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
2	68	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
3	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
4	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
5	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
6	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
7	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
8	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
9	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
10	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
11	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
12	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
13	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
14	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
15	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
16	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
17	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
18	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
19	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
20	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
21	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
22	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
23	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
24	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
25	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
26	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
27	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
28	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
29	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
30	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear
31	67	50	46	42	40	38	SW	1/2	SE	6	0.05	30.27	30.22	30.19	48.92	48.46	48.00	47.54	47.08	clear	clear



14 October 1881 – Churchstoke
 At 9am Direction SW Force (0-12) 10
 At 9pm Direction WSW Force (0-12) 4
 Remarks: Gale from S.W. from 4am -1-2pm a good deal of damage to lumber especially softwood, poplar, etc. Severn rising rapidly

High wind event = BF10

Date of recorded event*	Historical Data	Weather Stations (distance from Llysdinam)		
	Llysdinam	Churchstoke (50 km)	Carmarthen (80 km)	Hereford (60 km)
11/10/1876	1	0	0	0
29/01/1877	1	0	0	0
14/10/1877 [#]	1	1	0	0
02/03/1880	No data	1	0	No data
18/01/1881	0	0	1	No data
08/02/1881 [#]	1	1	1	No data
03/03/1881	No data	1	0	No data
19/03/1881	0	1	0	No data
14/10/1881 [#]	1	1	1	No data
01/11/1881	0	1	0	No data

Extreme events identified and triangulated with other qualitative and quantitative records

Potential for reconstruction of a range of meteorological variables



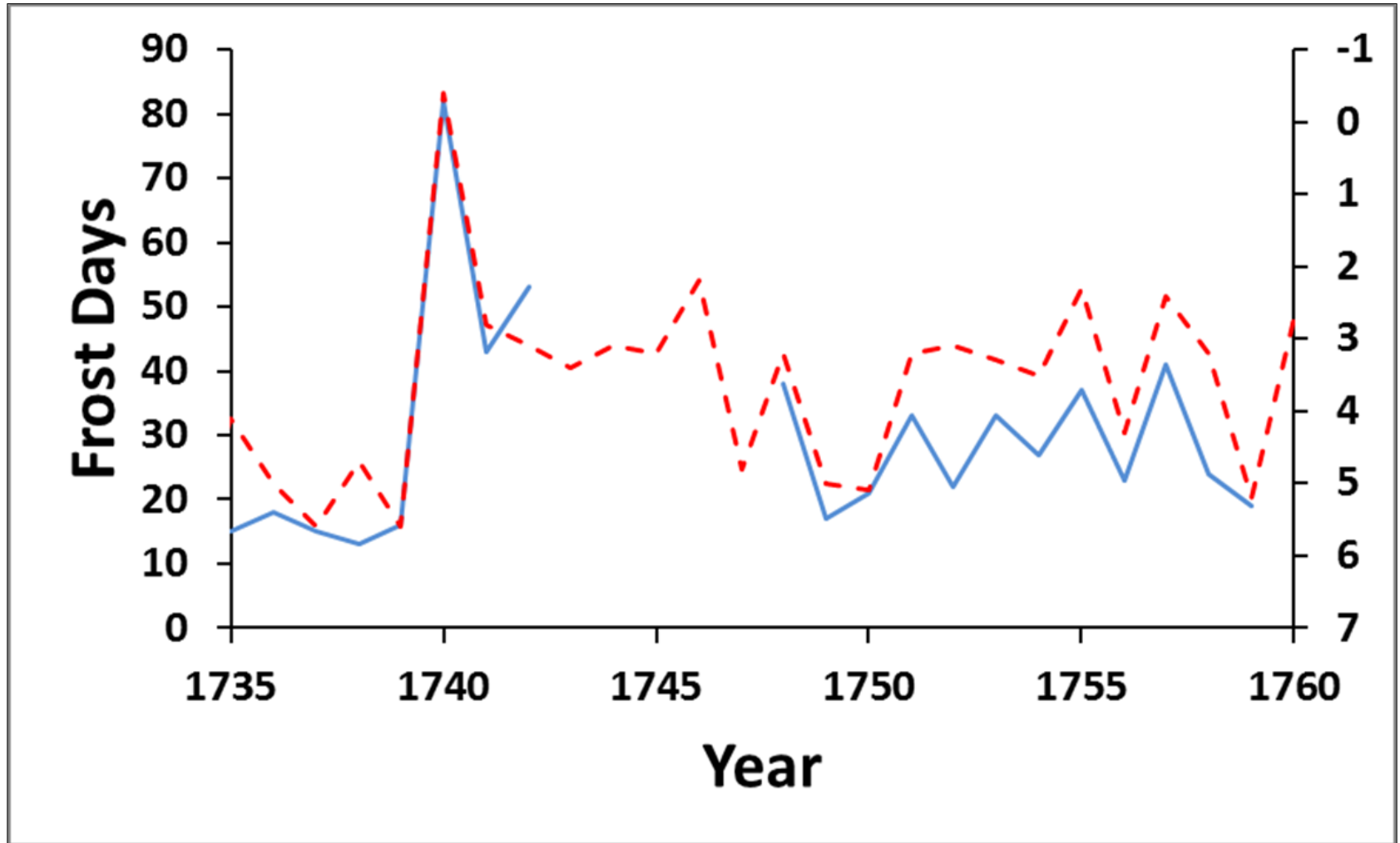
Image cannot be shared because of copyright restrictions.

William Bulkeley of Brynddu, Llanfechell, Anglesey (1691-1760)

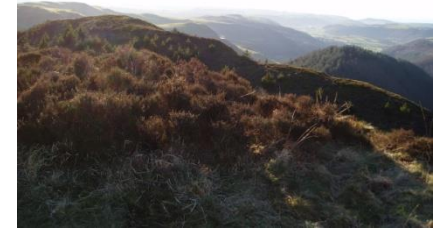
Photo: Vince Jones, C3W / Whole Picture

Gaeafau Oer

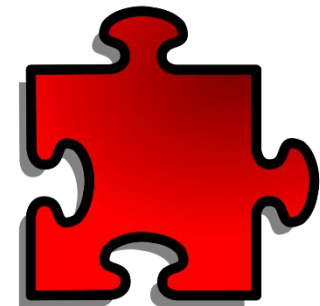
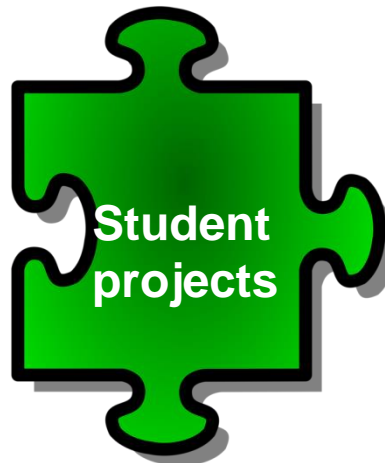
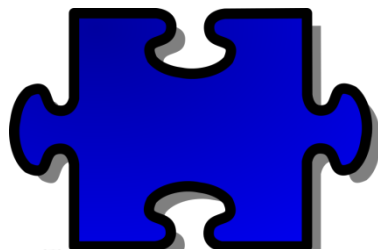
Cold Winters



Summary



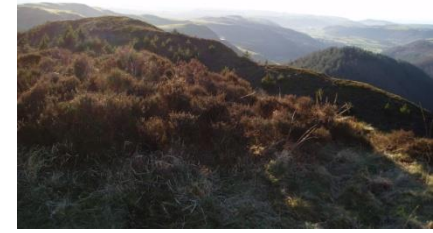
- Welsh (and particularly Welsh language) sources have begun to be explored
- Specific challenges with language evolution, regionally specific terms and deconstructing into a series of indices
- Valuable as represent areas poorly represented by existing datasets present within the UK (e.g. Central England Temperature Series)



CHERISH

Newid Hinsawdd a Threftadaeth yr Arfordir
Climate Change and Coastal Heritage
Athrú Aeráide agus Oidhreacht Chultúrtha

Summary



- Welsh (and particularly Welsh language) sources have begun to be explored
- Specific challenges with language evolution, regionally specific terms and deconstructing into a series of indices
- Valuable as represent areas poorly represented by existing datasets present within the UK (e.g. Central England Temperature Series)

