

Data collection

Protocol 2 analyses the communication and interfaces of the 50 most visited weather websites worldwide according to Similarweb.

Pages, articles and general contents concerning climate change on each website were retrieved through web scraping and search operators on both Google Search and Google Images.

SOURCES

Similarweb is a software and data company specialysing in web analytics, web traffic and performance. They gather traffic data from public sources, partnerships, analytics services and contributors and use them to provide websites' rankings. The rankings include a list of the "most visited weather websites worldwide" from 1 to 50.

SELECTION

A <u>spreadsheet</u> (Dataset P2_websites) was manually compiled, mapping key metrics for the 50 weather websites in the list (accessed on Feb 11, 2023). The saved information includes:

- rank \rightarrow 1 to 50;
- website \rightarrow e.g. bom.gov.au;
- country \rightarrow where the website is based;
- continent \rightarrow in which the country is located.

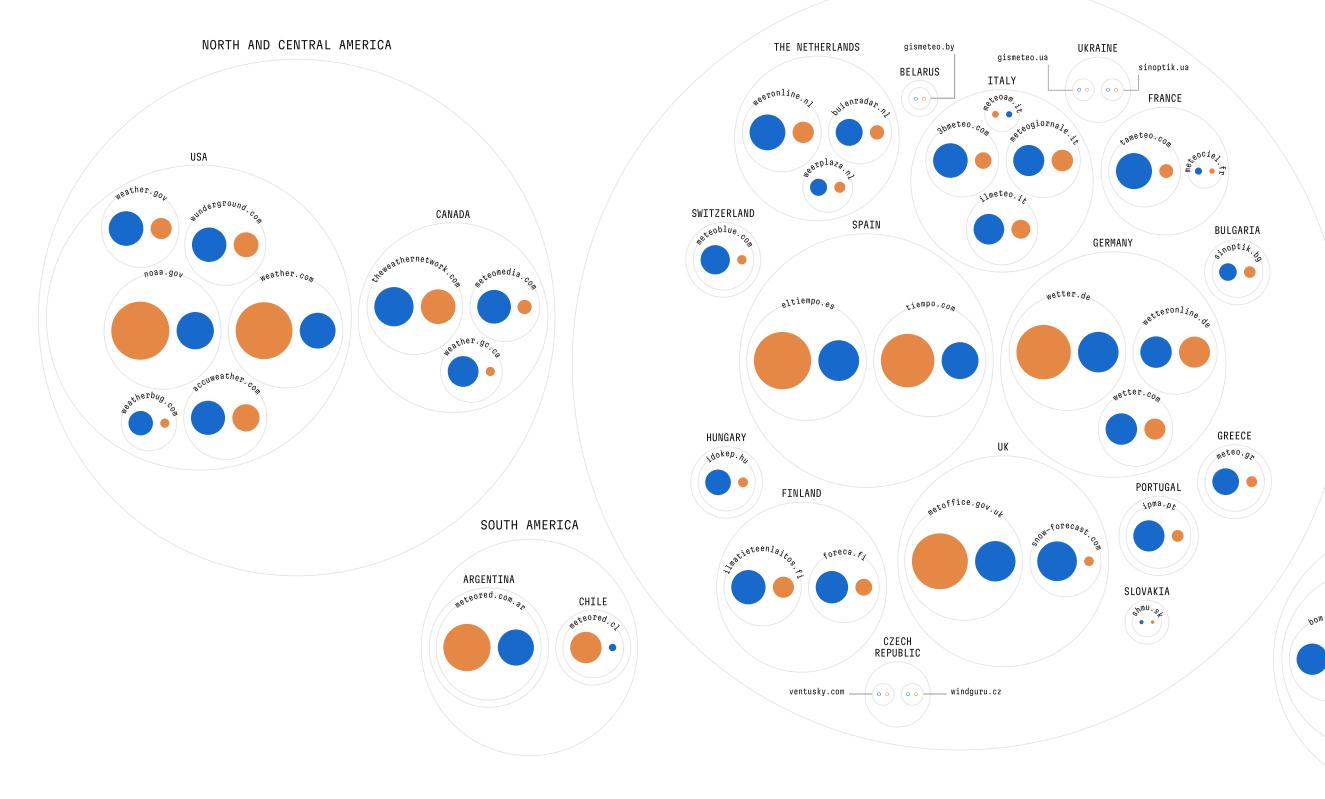
SCRAPING

A custom python script based on *Selenium* was used to scrape Google Search and <u>Google Images</u> through advanced queries. Every query is designed to return results which include "climate change" (or its translation) only from a specific website. A single query has the following structure:

site:website.domain "climate change (or translation)"

Scraping was performed for each of the 50 websites, using a VPN as well as Windows and Chrome settings to simulate as much as possible being in the country where the website is based, in order to influence the results accordingly.

Google results were loaded until reaching the end (or until Google displayed a message such as "the rest of the results might not be what you're looking for" or "in order to show you the most relevant results, we have omitted some entries very similar to the one already displayed"), and information for all of them was saved in one of two distinct spreadsheets: the first for Google Search (Dataset P2_GoogleSrc), the second for Google Images (Dataset P2_GoogleImg).



EUROPE

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DATASETS

Dataset P2_websites

Dataset P2_GoogleSrc

Including the 50 most visited weather websites worldwide at the moment of the analysis (according to similarweb).



Spreadsheet with detailed information on Google Search results including "climate change" for each website.

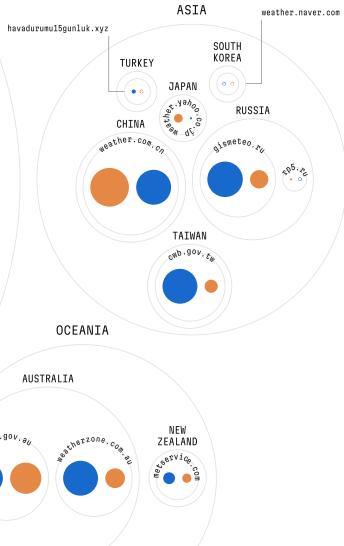


Dataset P2_GoogleImg Spreadsheet with detailed information on Google Images

♦ P2 → DATA COLLECTION → CIRCLE PACKING → VIZ 01

The visualisation to the left shows the number of results for each website from each scraping (Google Search and Google Images). Websites are grouped according to country and continent where they are based, the number of results is mapped to size and the type of scraping is connected to colour.





results including "climate change" for each website.

SCRAPED RESULTS \downarrow

The text entries resulting from both Google Search and Google Images scrapings were gathered and translated to English (when in a different language) in order to allow comparison.

SELECTION

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The textual entries resulting from the Google Search scraping are:

- titles;
- meta descriptions.

While the textual entries resulting from <u>Google Images</u> scraping are only:

• alt texts.

TRANSLATION

A custom Python script based on *GoogleTrans* was used to <u>translate all the</u> <u>extracted texts</u> into a single language: English. The code ran through all the entries mentioned above and saved the translations into a new csv file.

Each row of the csv file (Dataset P2_translations) includes both:

- the original text;
- its translation to English.

And for each translation it indicates:

- the website from which it was extracted;
- the type of text (e.g. title).

DATASET



Dataset P2_translations

Spreadsheet resulting from the translation of the textual entries from Google Search and Google Images scrapings.

Texts

Tag clouds

The analysis of translated texts started with detecting the predominant words in the websites, and later visualising them with sizes proportional to their frequencies.

WORD COUNT

A Python-based tool was used to process a word count on the translated texts of each website. The the following conditions were set:

- Language \rightarrow English;
- Custom stopwords \rightarrow *Climate*, *Change* + the website's name;
- Saved words \rightarrow most frequent 100.

The tool was also run on merged translations from all websites, three times:

- 1. Only on texts from Google Search scraping.
- 2. Only on texts from Google Images scraping.
- 3. On all texts, from both Google Search and Google Images scrapings.

All three times with the following conditions:

- Language \rightarrow English;
- Custom stopwords \rightarrow *Climate*. *Change* + all websites' names:
- Saved words \rightarrow most frequent 500.

For each word count process the tool produced a csv file with the list of most frequent words, their rank and their frequency.

TAG CLOUDS

The tag cloud generator tool from *Digital Methods Initiative* was used to create tag cloud visualisations out of all the word counts. From each word count list the generator produced an svg file in which the text sizes are associated to absolute frequency ranges (e.g. 61-65 times \rightarrow 18px).

INDIVIDUAL \leftrightarrow GLOBAL

The purpose of individual websites' tag clouds is to give an horizontal mapping of the words used in each website. On the other hand, the merged texts' tag clouds provide insights on general trends and patterns.

GOOGLE SEARCH \leftrightarrow GOOGLE IMAGES

Differentiating between Google Search and Google Images is functional to detect relevant differences between texts clearly visible - titles and meta descriptions and texts generally hidden - alt texts. The tag cloud centered on all texts from both scrapings, instead, provides the most comprehensive picture.

♦ $P2 \rightarrow TEXTS \rightarrow TAG CLOUDS \rightarrow VIZ 01$

The following visualisation shows all tag clouds from individual websites, grouped according to the continent where they are based. Inside each continent the reports are ordered on the basis of the number of their total results.

The proportion between word frequency and text size is consistent for all tag clouds inside the following visualisation, but it is different from the proportion in corresponding visualisations of protocol 1 and 3 (P1 \rightarrow texts \rightarrow tag clouds \rightarrow viz 01 and P3 \rightarrow texts \rightarrow tag clouds \rightarrow viz 01).

The visualisation is designed as follows:

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| | [Tag cloud] |
| CONTINENT | Where the website is based |
| WEBSITE | Domain |
| GS results | Saved results from Google Search scraping |
| GI results | Saved results from Google Images scraping |
| [FLAG] | Country where the website is based |
| [Tag cloud] | Each word followed by its absolute frequency |

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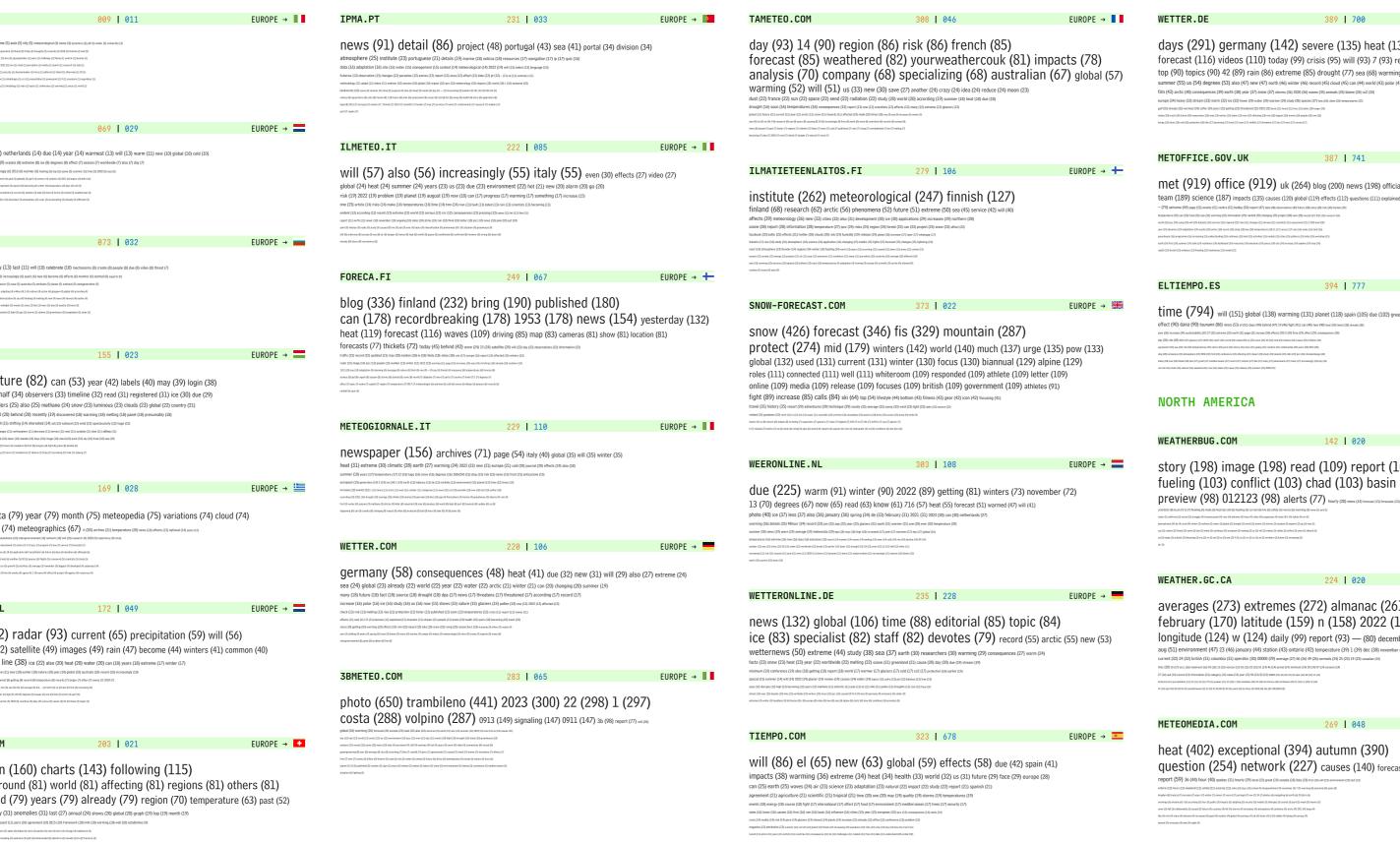
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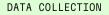
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| NOPTH 4 | AMERICA → ■ | global (85) report (57) bre impact (32) heat (30) may (30) rise (29) world (28) s warming (24) extreme (23) said (23) says (23) hurricanes (23) ki latest (20) various (20) year (3) excert (30) hill basiness (31) with discusses (7) mitigation (40) excert (30) and (30) excert (30) and significant (14) 2023 (40) excert (30) and (30) excert (30) and significant (14) 2023 (40) excert (40) and (30) excert (30) and (30) excert (30) and significant (14) 2023 (40) excert (40) and (30) excert (30) and significant (14) 2023 (40) excert (30) and (30) excert (30) and (30) excert (30) and significant (14) 2023 (40) excert (30) and (30) excert (30) and (30) excert (30) and significant (14) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) and (30) excert (30) and significant (30) excert (30) and (30) excert (30) excert (30) and significant (30) excert (30) | sea (28) experts (27) will (26) research (25) years (25) risi lice (23) dex (23) temperatures (22) suby (21) scientists (21) larch (17) water (27) ceane (17) commentary (17) analysis (17) water (17) water (27) searce (13) water (25) water (25) water (25) (21) were (25) (21) water (25) water (25) w | | bureau (139) changes (103) g administration (63) ministry (62) forecasting (60) res longter (45) system (47) forecast (49) ecan (41) warming (46) chara since (49 etal (54) can (41) development (34) ecan (33) and (32) pret eteres (51) 100 - chafting (54) development (34) exc (33) and 100 member (34) and (34) evelopment (34) exercision (34) and 100 member (34) exercision (34) evelopment (34) exercision (34) exercision 100 member (34) exercision (34) evelopment (34) exercision (34) exercision 100 member (34) exercision (34) events (34) exercision (34) exercision (34) exercision 100 member (34) exercision (34) events (34) exercision (| earch (58) communications (55) rainfall (55) years (53 detristic (9) monsoon (39) also (64) projoud (20) impact (50) platin (53) atmosphere (11) also (21) plotterm (13) ex (76) platic(6) statistical (21 80) eres (8) an (91 ler (23) eresp (2) writer (3) and (21 arc (23) eresp (3) writer (3) and (21 arc (23) eresp (3) writer (3) | | chile (30) global (20) due (18) will (16) warmin Ne 67 (Propert (300) global (20) foreast (8) (41) (Ne 67) ne (7) ne (7) ne wer (9) (ne (16) (16) (16) (16) (16) (16) (16) (16) | is (?) look (?) new (?) like (ii) antarctic (ii) als (ii) with () subsidiate (ii) () instalau (3) anna (3) level (1) (3 (3) without (ii) anna (3) level (ii) (ii) enem (ii) |
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| t (105) lake (104) sin (103) weekend | | THEWEATHERNETWORK.COM network (353) canada (115) Large (3) global (48) day (43) says (42) study (41) impacts (41) across (41) across (41) across (42) across (42) across (43) across (43) across (43) across (44) acros (44) across (44) across (44) across (44) across (44) ac | (41) extreme (40) extra/s (40) years (20) forecast (26) 7 (2) 207 years (70) years (20) years (20) forecast (26) (20) years (20) years (20) years (20) years (20) years (20) years (20) excusive (20) years (20) years (20) at (20) years (20) years (20) | NORTH AMERICA → | GISMETEO.RU news (80) scientists (74) (study (30) earth (29) (ce (29) article (29) impact (27) se due (24) species (24) can (23) may (22) years (21) ore (23) natural after (27) forces (10) and (8) depter (10) cance (10) and (27) and the (13) mathematic (3) may (24) can (23) may (22) years (21) ore (23) natural after (27) forces (10) and (8) depter (10) cance (10) and (27) and the (13) mathematic (3) may (24) and (24) ore (10) and (24) and (24) and (24) and the mathematic (3) may (24) and (24) and (24) and (24) and (24) and (24) and the mathematic (3) and (34) and (34) and (34) and (34) and (34) and (34) and the mathematic (3) and (34) and (34) and (34) and (34) and (34) and (34) and and (34) and (34) and and (34) and (34) and and (34) and (34) and and (34) and (34) and and (34) and (34) and and (34) and (34) and and (34) and (34) and and (34) and (34) an | ده (۲٫۲) planet (26) world (25) events (25) according (24) (19) water (19) huma (18) also (18) people (17) threat (17) همانه (12) water (13) mar (12) mar (13) mar (13) همانه (13) mar (13) mar (13) mar (13) همانه (13) mar (13) mar (13) همانه (13) mar (13) mar (13) «אווא (13) mar (13) «אווא (13) mar (13) mar (13) «אווא (13) m | ASIA → ■ | will (92) global (84) heat world (48) min (47) extreme (44) day (4 increase (29) record (29) wave (28) argentina (28) report (28)- ice (24) future (23) one (23) emparture (23) fett (24) and (24) effect (19) glober (39) more (18) for (34) the (10) end (10) end (10) end (10) for (10) end (10) | 2) can (40) years (40) drought (33) earth 4 (28) temperatures (26) 5 (26) 2022 (26) affect (25) even 8021 (21) study (20) may (20) human (20) currer (20) 80 (27) rec(1) sec 07) congle (17) re(1) at (21) seven (21) reflat (21) seven (21) reflat (21) seven (21) |
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| | | NOAA.GOV | 330 799 | NORTH AMERICA → 📕 | | | | | |
| NORTH A | AMERICA → 🚺 | national (265) global (1. fisheries (116) resilience (113 | 3) atmospheric (111) ocean (106 | 6) report (104) | OCEANIA | | | | |
| orecast (100) 14 (84) day (82) tre | rend (79) | climategov (103) administration (sea (79) science (78) toolkit (78) new (76) | (101) oceanic (99) laboratory (96) r) environmental (68) – (64) information (61) arctic | | METSERVICE.COM | 033 020 | OCEANIA → 🇱 | | |
| | | | Cs (53) centers (52) study (48) news (45) welcome (43) sanctuaries unging (38) office (38) sphere (54) acidification (54) scientists (34) nth (33) arbitro (32) model (31) well (32) well (35) scientists (36) (36) new (31) sector (32) well (32) well (33) sectors (36) (36) new (31) sector (32) on (32) yell (33) (36) new (31) sector (32) on (32) yell (33) (36) new (31) sector (32) on (32) yell (33) (36) new (36) new (36) new (36) new (37) (36) new (36) | | blog (18) meteorological (17) severe (11) world (11) events (5) zašland (5) clouds (5) regional (7) specialized (7) exterts (7) watches (7) text (5) armad (5) text (7) armad (5) presi (14) (4) (4) (4) (4) (4) (4) (4) (4) (4) (|) 2017 (6) report (6) understanding (6) tropics (6))) reports (1) entrope (1) dief (1) andread (1) entrope (2) and (2) entrope (2) entro | ng (9) | | |

poder (2) diversionis (2) frond (2) valided (2) spatien (2) interview (2) bearing (2) counting (2) sea (2) level (2) rise (2) coldification (3) maily (2) longhere (2) - (2) consulting (2) colembra (3) before (2) divelog (2) exceleter (2) station (2) what (2)



289 | 092 OCEANIA \rightarrow TAG CLOUDS \rightarrow VIZ 02

The following visualisation shows the three tag clouds resulting from the merged texts from all websites:

- 1. Google Search scraping only;
- 2. Google Images scraping only

3. Google Search and Google Images scrapings merged

The proportion between word frequency and text size is consistent for the first two tag clouds in the following visualisation, but it is different for the third one. Both ratios are also different from the proportion in corresponding visualisations of protocolland 3 (P1 \rightarrow texts tag clouds \rightarrow viz 02 and P3 \rightarrow texts tag clouds \rightarrow viz 02) as well as in the previous visualisation (P2 \rightarrow texts \rightarrow tag clouds → viz 01).

GOOGLE SEARCH

GOOGLE IMAGES



GOOGLE IMAGES & GOOGLE SEARCH

global (1983) forecast (1439) will (1392) heat (1359) time (1225) new (1176) report (992) news (988) warming (978) office (974) met (939) due (935) can (928) network (920) world (900) photo (884) extreme (873) snow (836) channel (799) meteorological (727) sea (629) years (621) 2022 (615) winter (613) data (611) blog (591) study (590) year (577) impacts (576) temperature (552) day (550) also (548) 2023 (543) earth (534) us (533) trend (512) ice (511) days (499) 1 (498) autumn (493) effects (484) china (483) record (472) science (460) may (444) trambileno (441) future (438) exceptional (420) events (415) causes (412) increase (412) arctic (409) videos (407) current (406) research (403) risk (393) water (389) see (388) impact (386) scientists (381) national (376) extremes (375) temperatures (374) changes (366) summer (365) one (356) 22 (352) rise (344) drought (343) top (343) mountain (342) maps (341) rain (339) winters (334) waves (333) planet (333) greenhouse (330) fis (329) now (327) bureau (3 severe (324) already (318) uk (317) fight (307) environment (304) institute (304) finland (304) 2021 (303) timeseries (302) protect (301) service (301) affected (300) region (300) much (300) published (296) costa (295) question (292) carbon (291) europe (290) united (289) canada (288) volpino (287) ipcc (285) averages (282) today (277) 14 (276) human (268) video (266) central (264) ocean (263) february (263) australia (262) almanac (261) neonle (258) consequences (257) first (255) bring (255) tralian (254) picture (254) warm (253) read (252) image (252) 2020 (251) according (249) el (248) cold (244) story (2 natural (216) used (214) regions (212) analysis (210) aft me (204) likely (203) crisis (203) 3 (202) wave (202) aetting

OCEANIA → 🏋

global (295) eorology (159) australian (154) a (137) statistics (131) acornsat (128)

.23) locations (104) state (79) australia (55) extremes (32) pacific (1.8) variability (1.7) zten (1

013 | 234 SOUTH AMERICA → (10) sea (12) years (12) extreme (10) world (10) sea (7) like (6) antarctic (6)

309 | 529 SOUTH AMERICA → ==

warming (64) due (56) new (53) planet (51)

0) years (40) drought (33) earth (33) waves (32) ratures (26) 5 (26) 2022 (26) affect (25) events (24) (20) may (20) human (20) current (20)

Tag clouds – categories

The merged texts' tag cloud including both Google Search and Google Images entries was further investigated: the words it contains were grouped on the basis of their meaning and in accordance with the evaluation criteria previously set.

CATEGORISATION

Each word from the merged tag cloud was categorised into <u>1 exclusive category of</u> 15, according to its meaning. Categories are the same as in protocol 1 and 3, and keep into consideration both the specific words in the tag clouds of all protocols and the evaluation criteria set prior to starting the analysis.

Each category can be made of 1, 2 or 3 specific subcategories. Categories and subcategories are listed and defined on the opposite page. However, the analysis initialy focused on first-level categories (highlighted in green in the list).

COLOUR CODING

A <u>colour for each category</u> was estabilished, then the words in the merged texts' tag cloud were coloured according to their category of belonging. Working directly with colour on the clouds allows to see:

- variety \rightarrow how many words for each category:
- frequency \rightarrow position and size of words for each category.

$\textcircled{P2} \rightarrow \text{TEXTS} \rightarrow \text{TAG CLOUDS} \rightarrow \text{VIZ 03}$

The visualisation on the right shows for each category the tag cloud, with the words falling in the category highlighted in colour.

In order to give more importance to the colours, words were replaced with rectangles through Dan Ross' *Flow Block* font. The terms included in the category were made readable in an ordered list (most frequent to least frequent) that follows each tag cloud.



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Weather |

08

forecast, snow, meteorological drought, rain, almanac, meteorology, rainfall, precipitation, air, floods, storms, forecasts, flooding, storm, fires, cloud, wind, droughts, clouds, hurricane, tsunami, nino, weathered

Solutions 🗖

bureau, fight, protect, un,

government, action, project,

adaptation, nations, help,

response

administration, intergovernmental,

green, agreement, sustainability,



Causes

due, causes, greenhouse, affected, carbon, caused, emissions, affecting, affect, cause, affects, energy, influence, co2, gas, related, gases, fueling, causing, dioxide, result, contributing, blame, pollution, methane

Impacts



new, extreme, impacts, effects, record, exceptional, events, increase, impact, extremes, changes, rise, top, waves, severe, already, much, consequences, level, average, many, effect, changing, recordbreaking, crisis, wave, increasing, increasingly, increased, rising, records, urge, threat, intense, threatens, disasters, frequent, phenomena, faster, end, heavy, increases, conflict, need, ever, must, alerts, major, problem, threatened



time, years, winter, year, day, days autumn, summer, winters, timeseries, february, november, daily, month, january, december, season, hourly, spring, weekend, 7day, biannual, annual, week, times, period, june, march, july, decades, april, october, seasons

Future

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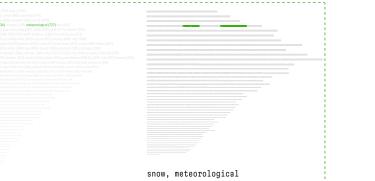
since, yesterday, 2019, 2018,

continues, history, century, earlier,

| Anticipation |
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2016, 2015

will, trend, future, projections, longterm, longer, next, 2050, trends can, may, risk, question, likely, around, questions, risks, possible, variability



CATEGORIES AND SUBCATEGORIES WITH THEIR EXPLANATIONS

1. WEATHER

- a. <u>Forecasts</u> \rightarrow words referring to weather and weather forecasting (e.g. meteorological);
- b. Phenomena \rightarrow words referring to weather phenomena and events (e.g. rain);

2. CAUSES

- a. <u>General</u> \rightarrow words generally related to causation *(e.g. due)*;
- b. <u>Climate change</u> \rightarrow words referring to specific causes of climate change
- (e.g. greenhouse);

3. SOLUTIONS

- a. Action \rightarrow words conveying the general idea of action/reaction (e.g. fight); b. Institutions \rightarrow words related to institutions or governments, supposed to act against climate change *(e.g. intergovernmental)*;
- c. <u>Climate change</u> \rightarrow words related to specific behaviours connected with climate change savviness (e.g. sustainability);

4. IMPACTS

- a. Extreme \rightarrow words conveying a sense of out of the ordinary (e.g. extreme);
- b. Effects \rightarrow words generally related to effects (e.g. impacts);
- c. <u>Threats</u> \rightarrow words related to clearly negative effects (e.g. disasters);
- 5. TIME

a. <u>Time</u> \rightarrow words expressing general time periods and intervals (*e.g. winter*);

- 6. PAST AND PRESENT
- a. <u>Past</u> \rightarrow words expressing specific moments in the past, specifically before the moment when the data was collected (e.g. 2019);
- b. Present \rightarrow words generally addressing the present moment (e.g. now);

7. FUTURE

- a. General \rightarrow words generally related to future (e.g. projections):
- b. Specific moment \rightarrow words expressing specific moments in future time (e.g. 2050);

8. ANTICIPATION

- a. <u>Uncertainty</u> \rightarrow words expressing uncertainty or doubt *(e.g. might)*;
- b. Certainty \rightarrow words expressing certainty or confident expectancy
- (e.g. sure);

9. LOCATIONS

- a. <u>General</u> \rightarrow general geographical terms (e.g. longitude);
- b. <u>Global</u> \rightarrow words related to earth as a whole *(e.g. global)*;
- c. <u>Local</u> \rightarrow words referring to specific locations *(e.g. greenland)*;

10. TEMPERATURE

a. <u>Temperature</u> \rightarrow words related to temperature (e.g. heat);

11. NATURAL ENVIRONMENT

a. Natural environment \rightarrow words related to natural environments, ecosystems and/or their elements (e.g. mountain);

12. SCIENCE

- a. <u>Institutions</u> \rightarrow words related to scientists and scientific institutions (e.g. ipcc);
- b. Studies \rightarrow words related to scientific studies and measurements (*e.g. data*);
- c. Information \rightarrow words related to scientific communications *(e.g. report)*;

13. MEDIA

- a. <u>Media</u> \rightarrow words generally related to formats and channels (*e.g. photo*); 14. PEOPLE
- a. <u>People</u> \rightarrow words connected with humanity as a group *(e.g. human)*;
- 15. OTHERS
- a. <u>Others</u> \rightarrow everything else;

heat, warming, temperature, temperatures, averages, warm, cold, degrees, tropical, warmer, melting, warmest, hot, hottest

Science

Temperature

stories, details, update, page, site, media, newspaper, online, topics, topic, menu, editorial, images, archives Others

Media 🛛

Natural environment

global, world, earth, us, china,

trambileno, arctic, national, planet,

uk, finland, region, costa, europe,

united, canada, volpino, australia.

australian, germany, north, state,

regions, taiwan, cities, states,

country, spain, british, latitude.

areas, italy, south, international,

finnish, countries, area, regional,

southern. chad. coastal. location

ontario, french, pacific, local,

greenland, worldwide, alps, east,

india, land, northern, paris,

california

longitude, locations, city, european,

Locations I

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sea, ice, water, mountain, environment, ocean, lake, natural, glaciers, species, marine, alpine, polar, trees, oceans, nature, environmental, forest, basin. glacier, antarctica, stream, animals, lakes, forests

report, data, study, science, research, scientists, mans, institute, published, ipcc, according, information, analysis, official, experts, conference, panel, statistics, scientific, charts, map, researchers, reports, assessment, student. whiteroom. ozone. observations, dictionary, nasa, studies, atlas



People

human, people, health

news, photo, channel, blog, videos, video, picture, read, image, story,

Tag clouds – subcategories

The last textual analysis also focused on the merged texts' tag cloud (Google Search & Google Images together): its purpose was to inquire deeper the representation of climate change made by weather forecast platforms. To do that, words from the tag cloud were rearranged according to second-level categories.

CATEGORISATION

The focus shifted on <u>subcategories</u> (second-level categorisation) from the ones previously listed and defined (complete list available on the right, subcategories highlighted in green).

CLUSTERING

The tag cloud was broken into single words, which were then <u>positioned according</u> to the subcategory they belong to. The information available through this kind of display is:

- variety \rightarrow how many words for each subcategory;
- frequency \rightarrow size of words for each subcategory.

 $\textcircled{P2} \rightarrow \text{TEXTS} \rightarrow \text{TAG CLOUDS} \rightarrow \text{VIZ 04}$

The visualisation on the right shows the words from the tag cloud grouped according to the category and subcategory they belong to. Words are readable, and their size is linked to their frequency as in the original tag cloud. Furthermore, each word is followed by its absolute frequency (in brackets).

The colour coding previously estabilished is mantained in order to strengthen the visual clustering of subcategories in higher-level groups.

| | (873) snow (836) channel (799) meteorological (727) sea (629) |
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| 101 | |
| snow (8) | 36) meteorological (727) |
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CLIMATE (COMMUNICATION) EMERGENCY

Weather

10

FORECASTS

forecast (1439) meteorological (727) almanac (261) meteorology (238) air (223) forecasts (170) ms (100) weathered (97)

Causes

GENERAL

due (935) causes (412) affected (300) caused (236) affecting (210) affect (204) cause (177) affects (167) influence (163) related (127) fueling (110) causing (108) result (106) contributing (103) blane (93) responsible (86)

Solutions

ACTIONS INSTITUTIONS fight (307) bureau (326) protect (301) un (186) government (186) nations (145) administration (129) action (183) project (163) intergovernmental (128) agreement (98) adaptation (161) help (145) (1990)

carbon (291) emissions (232) energy (167) co2 (139) gas (137) gases (120) disside (107) polation (49) methane (89)

PHENOMENA

CLIMATE CHANGE

greenhouse (330)

snow (836) drought (343)

rain (339) rainfall (225) precipitation (224)

floods (176) storms (172) flooding (165) storm (154) fires (152)

cloud (151) wind (131) drawabis (114) clouds (112) humicage (105) transmi (105) oils (102)

CLIMATE CHANGE

green (121) sustainability (83)

Impacts

EXTREME

new (1176) extreme (873) record (472) exceptional (420) increase (412) extremes (375) rise (344) wave (202) phenomena (122)

impacts (576) effects (484) events (415) impact (386) changes (366) waves (333) consequences (257) effect (220) changing (217)

EFFECTS

severe (324) already (318) much (300) level (232) average (229) many (227) recordbreaking (208) increasing (186) increasingly (175) increased (158) rising (155) records (150) urge (147) intense (135) frequent (122) faster (113) end (113) heavy (112 increases (111) ever (107) major (98)

Time

top (343)

GENERAL

time (1225) years (621) winter (613) year (577) day (550) days (499) autumn (493) summer (365) winters (334) timeseries (302) february (263) november (216) daily (172) month (171) january (154) december (154) season (153) hourly (152) spring (150) weekend (149) 7day (139) biannual (130) annual (129) week (118) times (115) period (114) june (113) march (113) july (98) decades (93) april (91) october (83) seasans (83)

Past & present

PAST

PRESENT

2022 (615) 2021 (303) 2020 (251) recent (196) past (192) 1953 (178)

2023 (543) current (406) now (327) today (277) continues (112)

since (166) yesterday (147) 2019 (136) 2018 (121) history (108) century (108) earlier (100) 2016 (100) 2015 (86)

Future

THREATS GENERAL SPECIFIC MOMENT GENERAL will (1392) trend (512) crisis (203) threat (142) threatens (126) disasters (124) conflict (111) need (108) must (105) future (438) projections (131) longterm (127) alerts (99) problem (93) threatened (98) longer (115) next (101) trants (88) stream (113) animals (102) takes (9) torests (88) Anticipation Science UNCERTAINTY CERTAINTY can (928) may (444) likelv (203) risk (393) question (292) around (175) questions (161) risks (150) possible (117) science pro Locations GENERAL GLOBAL LOCAL us (533) global (1983) national (376) china (483) Media region (300) world (900) trambileno (441) north (227) state (219) earth (534) regions (212) cities (189) arctic (409) GENERAL planet (333) states (187) country (180) uk (317) latitude (161) areas (150) south (142) finland (304) international (140) countries (136) area (130) costa (295) regional (126) longitude (125) coastal (119) locations (115) city (114) land (108) northern (106) europe (290) southern (105) location (102) local (95) exet (67) united (289) canada (288) topic (132) menu (131) editorial (101) images (93) archives (93) volpino (287) australia (262) People australian (254) germany (232) taiwan (206) spain (177) GENERAL british (172) italy (149) finnish (138) european (112) india (111) paris (105) chad (103) ontario (101) french (101) pacific (99) greenland (95) ster p human (268) people (258) health (226) Temperature GENERAL

Natural environment

sea (629) ice (511) water (389) mountain (342)

environment (304) ocean (263) lake (225) natural (216) glaciers (177) species (164) marine (158) alpine (151) polar (150) trees (143) oceans (138) nature (135) environmental (129) forest (128) basin (120) glacier (118) antarctica (116)

| WHO | WHAT | INFORMATION |
|---|---|--|
| scientists (381) institute (304) ipcc (285) experts (195) researchers (139) student (110) searce | data (611) study (590) science (460) research (403) according (249) analysis (210) official (209) statistics (155) scientific (147) | report (992) maps (341) published (296) information (237) conference (192) panel (158) charts (147) map (142) reports (137) |

news (988) photo (884) channel (799) blog (591) videos (407) video (266) picture (254) read (252) image (252) story (244) stories (205) details (197) update (197) page (193) site (191) media (180) newspaper (160) online (138) topics (135)

CATEGORIES AND SUBCATEGORIES WITH THEIR EXPLANATIONS

1. WEATHER

11

- a. Forecasts \rightarrow words referring to weather and weather forecasting (e.g. meteorological);
- b. <u>Phenomena</u> \rightarrow words referring to weather phenomena and events (e.g. rain);
- 2. CAUSES
- a. General \rightarrow words generally related to causation (e.g. due);
- b. Climate change \rightarrow words referring to specific causes of climate change
- (e.g. greenhouse);
- 3. SOLUTIONS
- a. Action \rightarrow words conveying the general idea of action/reaction (e.g. fight); b. Institutions \rightarrow words related to institutions or governments, supposed to
- act against climate change (e.g. intergovernmental); c. <u>Climate change</u> \rightarrow words related to specific behaviours connected with
- climate change savviness (e.g. sustainability); 4. IMPACTS
- a. Extreme \rightarrow words conveying a sense of out of the ordinary (e.g. extreme);
- b. Effects \rightarrow words generally related to effects (e.g. impacts); c. Threats \rightarrow words related to clearly negative effects (e.g. disasters);
- 5. TIME
- a. Time \rightarrow words expressing general time periods and intervals (e.g. winter); 6. PAST AND PRESENT
- a. <u>Past</u> \rightarrow words expressing specific moments in the past, specifically before the moment when the data was collected (e.g. 2019);
- b. Present \rightarrow words generally addressing the present moment (e.g. now);

7. FUTURE

- a. General \rightarrow words generally related to future (e.g. projections);
- b. Specific moment \rightarrow words expressing specific moments in future time (e.g. 2050);
- 8. ANTICIPATION
- a. <u>Uncertainty</u> \rightarrow words expressing uncertainty or doubt *(e.g. might)*; b. Certainty \rightarrow words expressing certainty or confident expectancy
- (e.g. sure);
- 9. LOCATIONS
- a. General \rightarrow general geographical terms (e.g. longitude);
- b. <u>Global</u> \rightarrow words related to earth as a whole *(e.g. global)*;
- c. Local \rightarrow words referring to specific locations (e.g. greenland);
- **10. TEMPERATURE**
- a. Temperature \rightarrow words related to temperature (e.g. heat):
- 11. NATURAL ENVIRONMENT
- a. Natural environment \rightarrow words related to natural environments, ecosystems and/or their elements (e.g. mountain);
- 12. SCIENCE
- a. Institutions \rightarrow words related to scientists and scientific institutions (e.g. ipcc);
- b. Studies \rightarrow words related to scientific studies and measurements (e.g. data);
- c. Information \rightarrow words related to scientific communications *(e.g. report)*;
- 13. MEDIA
- a. Media \rightarrow words generally related to formats and channels (*e.g. photo*); 14. PEOPLE
- a. <u>People</u> \rightarrow words connected with humanity as a group *(e.g. human)*;
- 15. OTHERS
- a. <u>Others</u> \rightarrow everything else;

heat (1359) warming (978) temperature (552) temperatures (374) averages (282) warm (253) cold (244) degrees (218) tropical (189) warmer (174) melting (170) warmest (168) hot (137) tenses (33)

All images extracted with the Goole Images scraping were considered.

IMAGE COUNT

13

Google Images scraping provided urls for $\underline{8,043 \text{ total images}}$, all of which were downloaded in order to be analysed.

Images

Network

Images were arranged into a network based on AI image captioning. The network provided the base for mapping the visual representations of climate change in the websites.

VISUAL SIMILARITY

The 8,043 images were fed to Yale DHLab's *PixPlot* in order to get an interactive image network based on similarity: each picture is captioned from a previosly trained neural network model, then all pictures are arranged in the space according to their content similarity.

The network can be explored through panning and zooming in the space or jumping to hotspots (image clusters). PixPlot automatically identifies some default hotspots, but they can also be created and curated by the user.

TAGGING

A static screenshot of the network was taken and manually tagged according to groups and clusters visually identified while exploring the interactive model and with the help of automatically identified hotspots.

♦ P2 \rightarrow IMAGES \rightarrow NETWORK \rightarrow VIZ 00

The visualisation on the right shows the 8,043 images (resulting from Google Images scraping as previously described) displayed in the space on the basis of similarity (according to PixPlot's process of image captioning and positioning through a pre-trained convolutional neural network model).

Areas characterised by the predominance of a specific subject are outlined and tagged, even if subject clusters are often more spread around and less localised than they appear.

A straight line separates the left portion of the map (where the majority of images are diagrams) from the right portion (where the majority of images are photos).

CLUSTERING

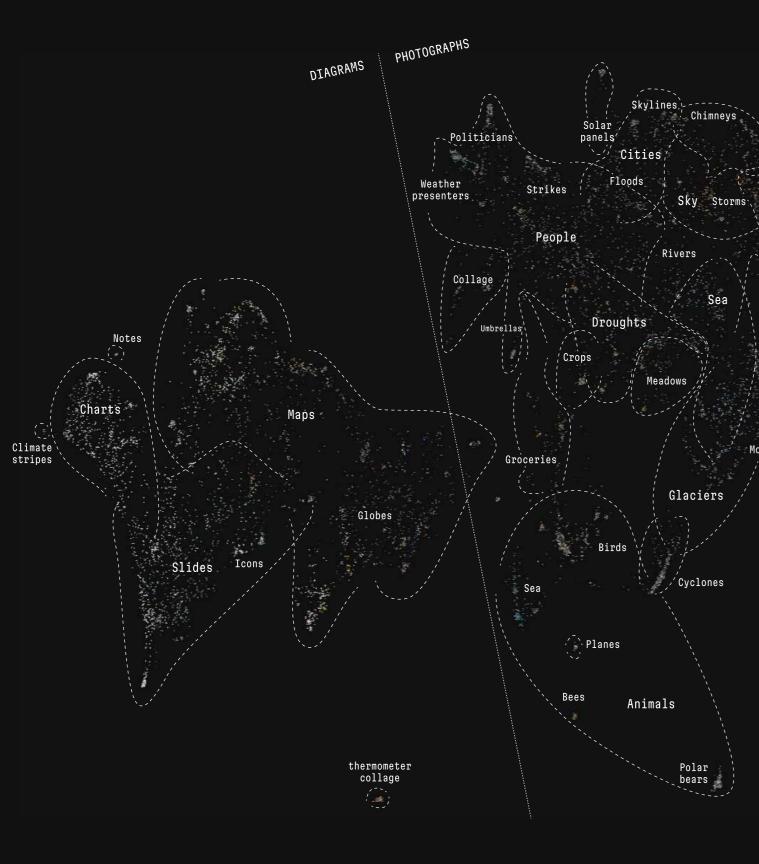
The network mapping was expanded into a <u>detailed clustering of the images</u> through the creation of a hierarchy of manually curated hotspots. The categorisation process kept into consideration the actual images' features and subjects as well as the evaluation criteria previously set. The hierarchy of (not exclusive) image clusters is visible on the opposite page.

INTERACTIVE NETWORK



PixPlot P2

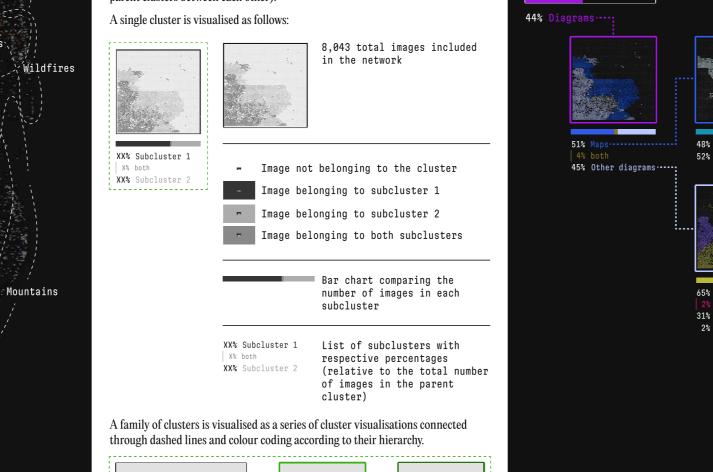
Interactive network including all the 8,043 images, displayed according to image similarity and with hotspots based on images' subjects.

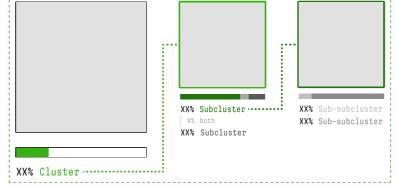


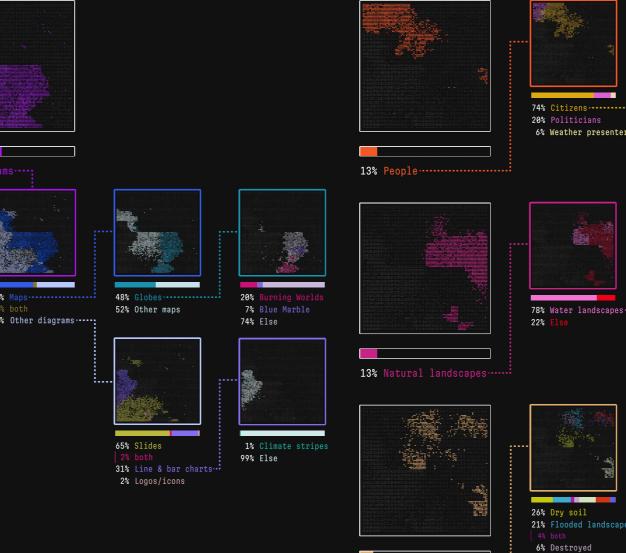
♦ P2 \rightarrow IMAGES \rightarrow NETWORK \rightarrow VIZ 01

The visualisation on the right displays the <u>cluster hierarchy and the quantity of</u> images for each cluster and subcluster. It builds on the grid display provided by PixPlot and uses colour to distinguish one category from the others as well as for highlighting the links in the hierarchy.

Clusters are ordered from the most populated to the least populated. Quantities are always expressed as percentages, since the most interesting comparison in that sense is that between child clusters belonging to the same parent cluster (or that of parent clusters between each other).

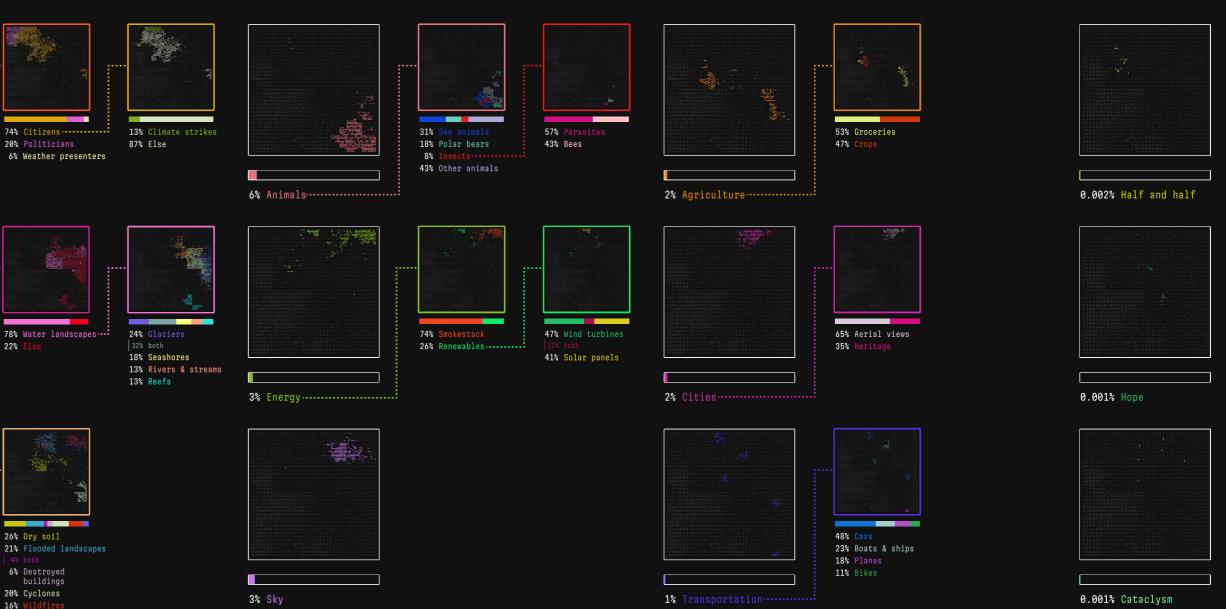






10% Extreme weather....

20% Cyclones 16% Wild 7% Stormy clouds



HIERARCHY OF IMAGE CLUSTERS

| ▲ | Burning worlds Blue marble |
|---|---------------------------------|
| Other maps Other diagrams Slides Line & bar charts Logos & icons | Else Climate stripes Else |
| PEOPLE Citizens Climate strikes • Else • Politicians • Weather presenters | |
| NATURAL Water Glaciers LANDSCAPES landscapes Seashores Rivers & streams Reefs | |
| • Else | |
| EXTREME Dry soil WEATHER - Flooded landscapes - Destroyed buildings - Cyclones - Wildfires - Stormy clouds | |
| ANIMALS Sea animals • Polar bears • Insects Parasites • Bees • Other animals | |
| ENERGY Smokestack • Renewables• Wind turbines • Solar panels | |
| SKY | |
| AGRICULTURE Groceries • Crops | |
| CITIES Aerial views • Heritage | |
| TRANSPORTATION• Cars • Boats & ships • Planes • Bikes | |
| HALF AND HALF | |
| HOPE | |
| CATACLYSM | |

Network – images

Clustered images were reconnected with their visual appeareance through cluster-specific wall of images based on the grouping hierarchy.

_____ CHILD CLUSTER

All images in each low-level-cluster (clusters which don't contain other clusters) were downloaded and arranged together in creating <u>cluster-specific image walls</u>. The purpose of this operation was to connect the abstraction of the network with the qualitative appearence of the images, providing samples of the distinctive visual qualities in each image group.

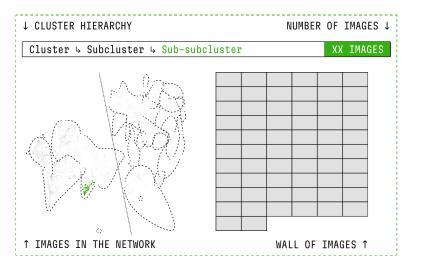
The complete hierarchy of clusters with all low-level-clusters highlighted in green is available on the right.

♦ P2 → IMAGES → NETWORK → VIZ 02

The visualisation on the right covers all <u>low-level-clusters in the previously</u> <u>defined hierarchy</u>. For each cluster are shown:

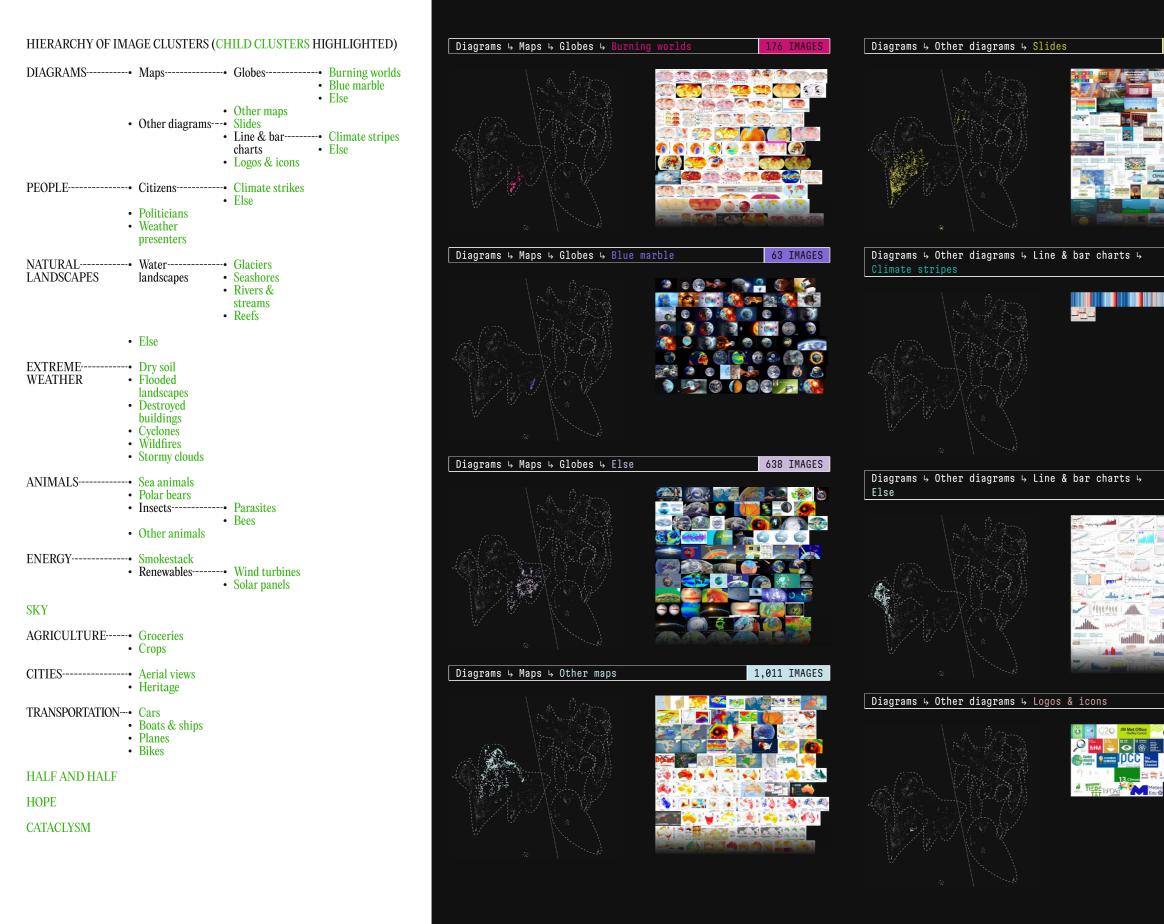
- the hierarchy of its parent clusters (if any);
- the number of images in the cluster;
- the position of the images in the network;
- a sample of images from the cluster (image wall).

Colours are mantained from the previous visualisation (P1 \rightarrow images \rightarrow network → viz 01). A single cluster is visualised as follows:



The sequence of low-level-clusters' displays is followed by a miniature of the tagged network (P2 \rightarrow images \rightarrow network \rightarrow viz 00), in order to provide an easy-to-consult map of the network areas.

| DIAGRAMS | • Maps | | Blue marble |
|-----------------------|---|--|---|
| | Other diagrams | Other maps Slides Line & bar | Else Climate stripes Else |
| PEOPLE | • Citizens | Climate strikes Else | |
| | Politicians Weather presenters | | |
| NATURAL LANDSCAPES | | Glaciers Seashores Rivers & streams Reefs | |
| | • Else | | |
| EXTREME WEATHER | Dry soil Flooded landscapes Destroyed buildings Cyclones Wildfires Stormy clouds | | |
| ANIMALS | Polar bears Insects | Parasites Bees | |
| ENERGY | SmokestackRenewables | Wind turbinesSolar panels | |
| SKY | | | |
| AGRICULTURE | GroceriesCrops | | |
| CITIES | Aerial viewsHeritage | | |
| TRANSPORTATION | Cars Boats & ships Planes Bikes | | |
| HALF AND HALF | | | |
| HOPE | | | |
| CATACLYSM | | | |





A map of climate change representations across the online weather forecast landscape

Image plot

The visual space of the websites was also examined in regard to hue and brightness values in the pictures, to detect trends and tendencies in the use of colours of climate crisis' representations.

IMAGE MEASURING

Colour values in each of the 8'043 images were measured through ImageMeasure for ImageJ. In particular, the process returned for each picture:

- median of brightness values;
- standard deviation of brightness values;
- median of saturation values:
- standard deviation of saturation values:
- median of hue values;
- standard deviation of hue values.

PLOT DIMENSIONS

The measures of brightness and hue were used to build a plot of images through *ImagePlot* for ImageJ. The axis of the plot were mapped as below:

- X axis \rightarrow median of hue values (*hue_median*);
- Y axis \rightarrow standard deviation of brightness values (*brightness_stdev*).

Each image was positioned in the plot according to its measured values.

PLOT EVALUATION

The distribution in the plot was analysed mainly in regard to the hue values, considering image density as well as recurring subjects across the x axis.

$\textcircled{P2} \rightarrow IMAGES \rightarrow IMAGE PLOT \rightarrow VIZ 01$

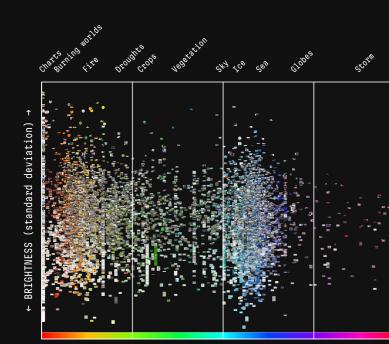
The visualisation on the right shows the 8,043 scraped images distributed in the space according to their hue values (median mapped on X axis) and brightness values (standard deviation mapped on Y axis), as previously explained.

The plot is split vertically into 4 portions of equal width, according to hue values:

- 1. red to green (X1);
- 2. green to light blue (X2);
- 3. light blue to purple (X3);
- 4. purple to red (X4).

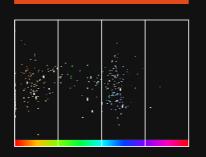
The purpose of those portions is to facilitate the evaluation of image density in relation to hue values.

Recurring subjects for specific hue areas are noted above the plot.



← HUE (median) →

CLIMATE CHANGE

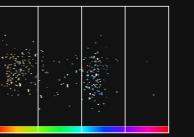




Solutions

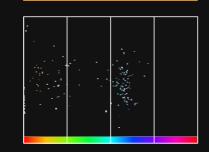
ACTIONS

INSTITUTIONS





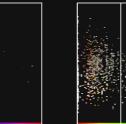
CLIMATE CHANGE

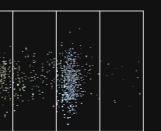


18

Impacts

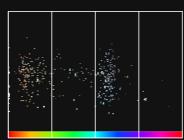
EXTREME





THREATS



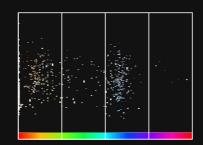


Future

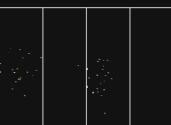
GENERAL

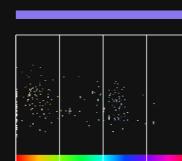
SPECIFIC MOMENT

EFFECTS









Temperature

TEMPERATURE

People

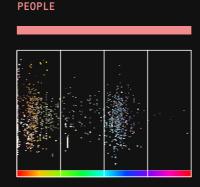


IMAGE FILTERING

Each scraped image is connected to its respective <u>alt text</u>. Words from the merged texts' tag cloud were used as filter queries in order to extract all images whose alt texts include terms connected to a specific category and subcategory. For example, images with the word "exceptional" in their alt text are connected with the *extreme* subcategory of the *impacts* category as defined in the text analysis.

Terms from 6 specific categories (and respective subcategories) were used to classify images. The categories were chosen on the basis of their relevance according to the evalutative criteria set prior to the analysis, and they are:

- causes (general, climate change);
- solutions (actions, institutions, climate change);
- impacts (extreme, effects, threats);
- future (general, specific moment);
- temperature (temperature):
- people (people).

ImageMeasure and *ImagePlot* for ImageJ were used to build hue/brightness plots for each subcategory. The axis of the plots were mapped as below:

- X axis \rightarrow median of hue values (*hue median*);
- Y axis \rightarrow standard deviation of brightness values (*brightness_stdev*).

Each image was positioned in the respective plot according to its measured values.

CATEGORY-BASED \leftrightarrow GLOBAL

The axis of every individual plot include the same range of values, in order to make them comparable. The evaluation of subcategory-based plots in relations to the global plot is also encouraged, in order to detect cross-category tendencies as well as <u>category-specific features</u> in the use of colours.

$\textcircled{P2} \rightarrow IMAGES \rightarrow IMAGE PLOT \rightarrow VIZ 02$

The visualisation on the left shows the <u>subcategory-specific image plots</u> for the 6 categories selected. As in previous visualisation (P2 \rightarrow image \rightarrow image plot \rightarrow viz 01), images are distributed in the space according to their hue values (median mapped on X axis) and brightness values (standard deviation on Y axis). Each plot is split vertically into 4 portions of equal width, according to hue values:

- 1. red to green (X1);
- 2. green to light blue (X2):
- 3. light blue to purple (X3);
- 4. purple to red (X4).

The purpose of those portions is to facilitate the evaluation of image density in relation to hue values for visual spaces connected to specific concepts.

19

Through the urls of the scraped results regarding the 50 websites, pages and sections centered on the climate crisis were identified and listed.

CLIMATE CHANGE PAGES

The last piece of analysis of protocol 2 was centered on <u>specific sections and pages</u> of the 50 weather websites, <u>explicitly designed and produced to address climate</u> <u>change</u>. The focus was on containers rather than contents: not single articles connected to a climate change particular expression (e.g. a single weather event), but portions of the site dedicated to climate change in general.

SELECTION

21

Through a process of dataset exploration and url parsing, <u>77 climate change pages</u> from 27 of the total 50 websites were selected (23 websites didn't have any section expressely related to the issue).

CATEGORISATION

The 77 web pages were classified according to 9 exclusive categories:

- 1. Section → ramified portion of the website fully centred on climate change, often covering various aspects and perspectives.
- 2. News tag \rightarrow collection of news tagged climate change or similar.
- 3. Blog tag \rightarrow collection of blog articles tagged climate change or similar.
- 4. Glossary \rightarrow information in the form of terminology explanations.
- 5. Educational → section with lectures, presentations, tests and similar content (mainly intended for schools).
- 6. Research \rightarrow portal that leads to technical studies on climate change aspects.
- 7. Data \rightarrow dashboard showing updated data on aspects of climate change.
- 8. Feature \rightarrow collaboration of the website with some other organisation/entity in order to make a systemic communication focused on climate change.
- 9. Business \rightarrow page which promotes services connected to climate change.

All climate change pages were listed in a csv file (Dataset P2_urls), with indication of respective category and website of origin.

DATASET



Dataset P2_urls

Spreasheet listing the 77 climate change pages identified through the weather websites, with respective categories.

Urls

Climate change pages

Analysis of climate change pages started with mapping the pages according to their height in pixels, website of origin and page category.

MEASURING LENGTH

The <u>height in pixels of each climate change page</u> was measured through full page screenshots' sizes. The purpose of the measure was to provide an easily assessable (although partial) metric on the quantity of content inside each page.

PAGE MAPPING

Each climate page was classified according to the 9 <u>categories</u> previously defined. Also, climate change pages were listed according to their <u>website</u> of origin. Websites, in turn, were grouped according to the country and continent where they were based.

\circledast P2 \rightarrow URLS \rightarrow CLIMATE CHANGE PAGES \rightarrow VIZ 01

The visualisation on the right is a matrix plot showing climate change pages at the intersection between page categories and websites:

- * X axis \rightarrow websites < countries < continents
- Y axis \rightarrow page categories

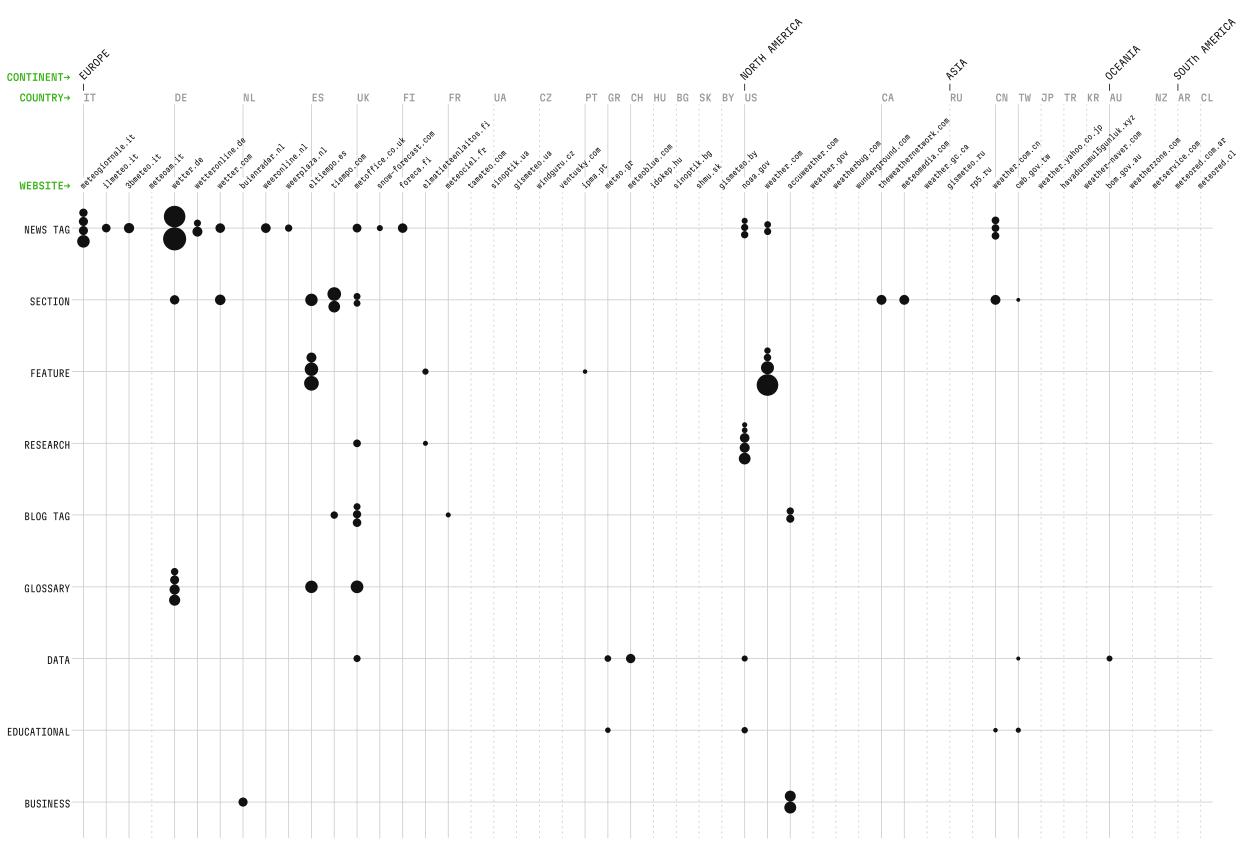
Page categories are ordered according to the number of pages they include (from the one with the most pages, at the top, to the one with the least, at the bottom).

Websites, instead, are grouped according to country and continent. Continents, countries inside each continent and websites inside each country are ordered according to the respective number of climate change pages they include.

Climate change pages are represented as circles at the intersection between a category and a website. The circle size is proportional to the corresponding page's height (in pixels). If there's more than one page for a single category/website intersection, corresponding circles are placed one above each other, from the smallest (on top) to the biggest (at the bottom).

PAGE HEIGHT \downarrow





23

URLS

24

Paths - page types

Climate change pages were examined in relation to their ease of access from the main page of the corresponding website, as a metric of the visibility and importance attributed to them.

PATH DETECTION

The path detection from the home page to the climate change page considered was mostly done manually, following the phases below:

- 1. open the home page;
- 2. try the following:
- a. inspect mode and search box to look for the climate change page's url (or at least a portion of it):
- b. English translation of the page and search box to look for keywords connected to the climate change page's title or content;
- c. English translation of the menu to look for a rationale path in the direction of the considered climate change page;

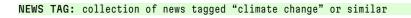
3. two cases:

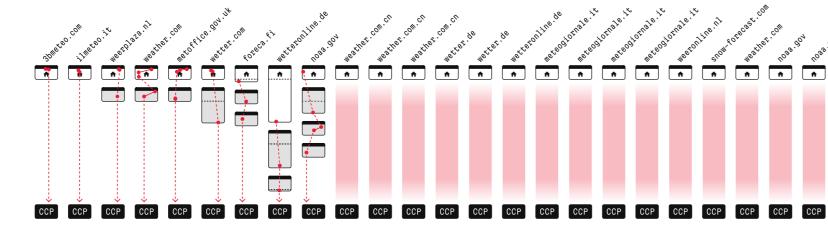
- a. if one of the procedures in point 2 seems to lead to a promising new page (closer to the considered climate change page), open the new page; then start again from point 2:
- b. if none of the procedures in point 2 leads anywhere, move back to the previous page and try other paths;
- 4. repeat until reaching the climate change page or until all reasonable paths from the home page prove to be dead ends; in the latter case, the analysis proves that no clear direct path from the home page to the considered climate change page exists.

Out of 77 total climate change pages, 38 didn't have any clear direct path from the home page.

GROUPING - PAGE CATEGORIES

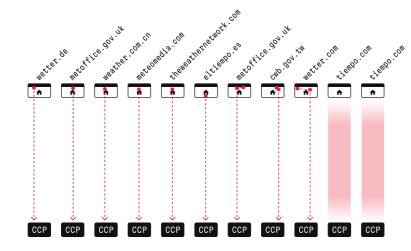
Paths were examined in groups in order to detect relevant tendencies. The first grouping was on the basis of page categories.





SECTION: ramified portion of the website fully centred on climate change, often covering various aspects and perspectives

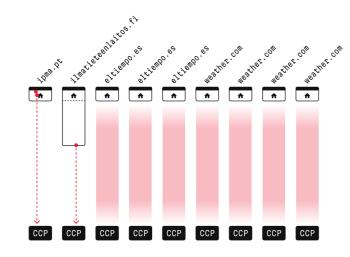
RESEARCH: portal that leads to technical studies on climate change aspects

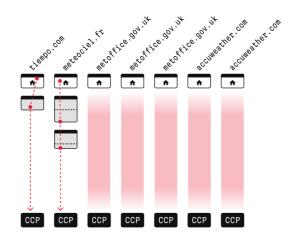


• **†** • **†** _ Ì CCP CCP CCP CCP CCP CCP

similar

FEATURE: collaboration of the website with some other organisation/entity in order to make a systemic communication focused on climate change



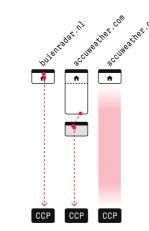


25

GLOSSARY: information in the form of terminology explanations

CCP CCP CCP CCP CCP

DATA: dashboard showing updated data on aspects of climate change



BUSINESS: page which offers and promotes services connected to climate change

♦ P2 → URLS → PATHS → VIZ 01

The visualisation on the left shows the paths from home pages to climate change pages, grouped by page categories. Paths are represented as series of interactions (clicks or hovers) across one or more pages. The position of interactions in each page is accurate, and interactions which needed some scrolling impact on the length of their respective page in the path.

Inside a group, paths are ordered according first to the number of steps (pages inbetween the home page and the climate change page) and then to the total height scrolled, and finally to the total number of interactions.

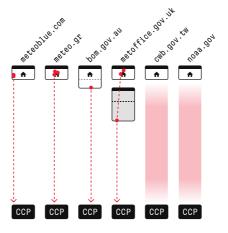
Each path has indicated above the website it comes from.

| 🔒 Home page | Interaction (click/hover) | |
|-------------|------------------------------|--|
| Path page | Cursor movemen | |

Cursor movement

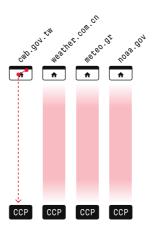
CCP Climate change

Browse to next page



BLOG TAG: collection of blog articles tagged "climate change" or

EDUCATIONAL: section with lectures, presentations, tests and similar content (mainly intended for schools)



No direct path

26

Paths - individual pages

Paths were synthesised and grouped on the basis of websites, in order to provide a wide mapping of each platform's effort in covering the topic. *For the examination to be more detailed, screenshots of the climate* change pages were paired with respective paths.

PATH SYNTHESIZING

Paths were regrouped, this time <u>according first to their website of origin</u>. The information on the interactions was left behind, and the tracking focused more on number of pages in-between and lengths to scroll.

CLIMATE CHANGE PAGES SCREENSHOTS

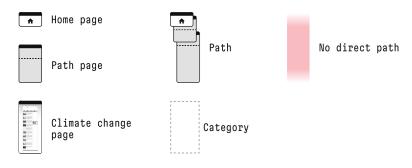
Full length screenshots of climate change pages, produced with GoFullPage, are taken into consideration in order to provide information about both the length of the page and its visual appeareance.

$\textcircled{P2} \rightarrow \text{URLS} \rightarrow \text{PATHS} \rightarrow \text{VIZ} \ 02$

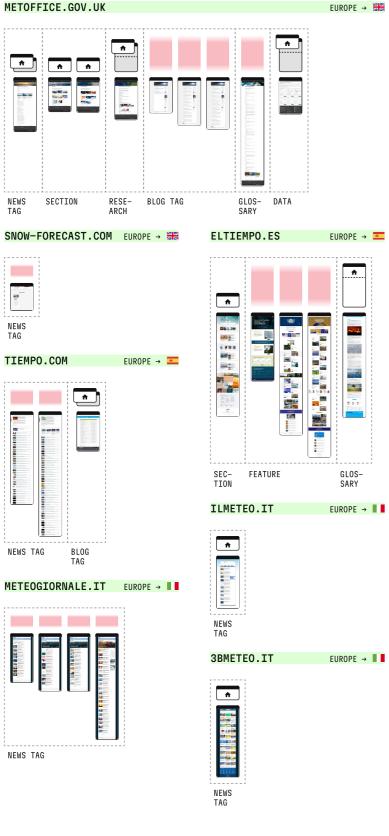
The visualisation on the right shows the paths from home pages to climate change pages and the appearance of the considered pages, grouped by website. Inside each website, the path/page pairs are grouped according to their category. Inside each category they are ordered according to the number of pages in the path, then to the total height scrolled in the path, then to the height of the page. Websites are also grouped on the basis of continents and countries. The visualisation for a single website is designed as below:

| CONTINEN | IT | CONTINENT | Based on country |
|----------|--------------------|-----------|---------------------|
| WEBSITE | CONTINENT → [FLAG] | WEBSITE | Url of home page |
| | | CONTINENT | Based on country |
| | [PATH/PAGE] | [FLAG] | Country of the site |
| | | | |

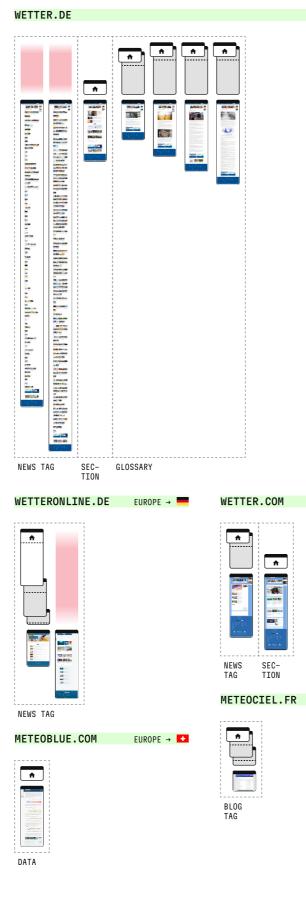
Paths are shown as sequences of pages, which height depends on the height scrolled in the actual paths. Interactions are not represented.



A -----



EUROPE -----



NORTH AMERICA \rightarrow

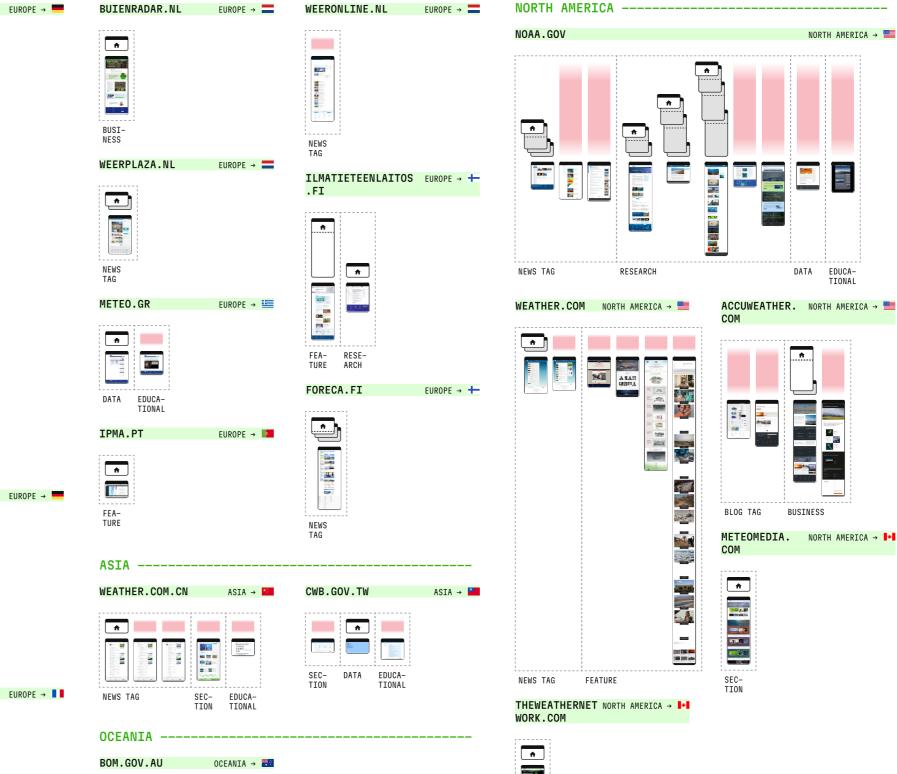
DATA EDUCA-TIONAL

BUSINESS

WEBSITE/PAGES TABLE

Below, a table that synthesises the visualisation on the left (P2 \rightarrow urls \rightarrow paths \rightarrow viz 02) by showing the number of climate change pages, with and without a path from the home page, for each website (ordered according to the number of climate change pages with a path, from the highest to the lowest).

| WEBSITE | PAGES WITH DIRECT ACCESS | PAGES WITHOUT DIRECT ACCESS |
|-----------------------|-----------------------------|--------------------------------|
| METOFFICE.GOV.UK | 5 | 4 |
| WETTER.DE | 5 | 2 |
| NOAA.GOV | 4 | 5 |
| ELTIEMPO.ES | 2 | 3 |
| WETTER.COM | 2 | 0 |
| ILMATIETEENLAITOS.FI | 2 | 0 |
| WEATHER.COM | 1 | 5 |
| WEATHER.COM.CN | 1 | 4 |
| ACCUWEATHER.COM | 1 | 3 |
| TIEMPO.COM | 1 | 2 |
| VWB.GOV.TW | 1 | 2 |
| WETTERONLINE.DE | 1 | 1 |
| METEO.GR | 1 | 1 |
| ILMETEO.IT | 1 | 0 |
| 3BMETE0.IT | 1 | 0 |
| METEOBLUE.COM | 1 | 0 |
| METEOCIEL.FR | 1 | 0 |
| BUIENRADAR.NL | 1 | 0 |
| WEERONLINE.NL | 1 | 0 |
| WEERPLAZA.NL | 1 | 0 |
| IPMA.PT | 1 | 0 |
| FORECA.FI | 1 | 0 |
| BOM.GOV.AU | 1 | 0 |
| METEOMEDIA.COM | 1 | 0 |
| THEWEATHERNETWORK.COM | 1 | 0 |
| METEOGIORNALE.IT | 0 | 4 |
| SNOW-FORECAST.COM | 0 | 1 |
| WEERONLINE.NL | 0 | 1 |



A