

WP 2

Scientific coordination, mentoring and education

USFD LU UOULU TSU IGF/PAS

Overall aim:

communicate INTERACT activities within and outside the consortium by developing and applying new resources including **human resources** and resources for **education** at all levels.

Specific aims:

- To coordinate the communication of the science and to foster international collaboration
- To promote Arctic and climate change issues in school and university education and to provide appropriate resources

Task 2.1 Coordination and collaboration in Science

Task 2.1a Intergenerational communication within INTERACT – INTERACT mentoring programme

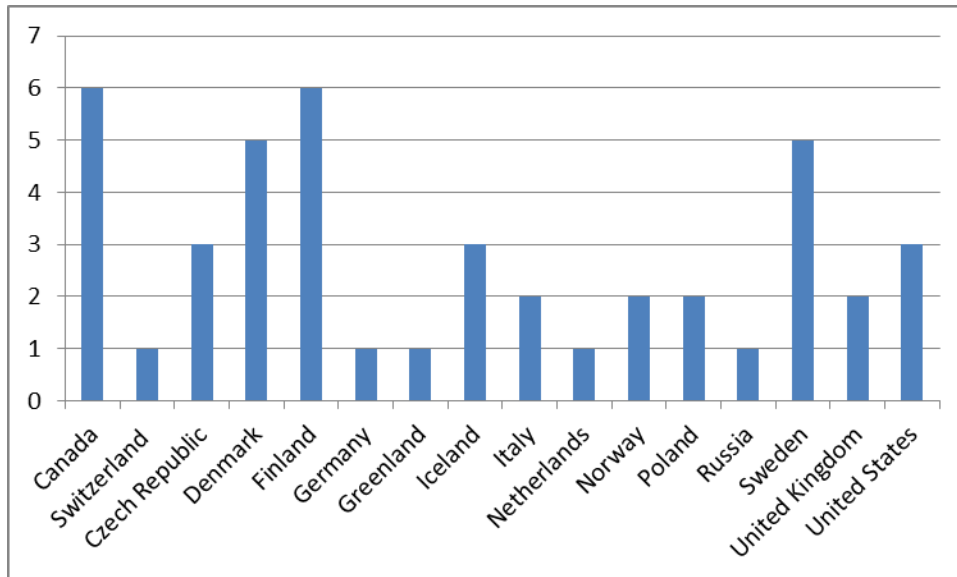
Establish a bulletin board on the web site advertising facilities for mentoring on a range of science topics (MS2.1) and arranging opportunities at consortium meetings for partners that request mentoring in some scientific aspect (e.g. WP3 Awareness of the scene).

MS6 delayed from Month 2 to 13. Progress by CLU and IGF/PAS

Task 2.1b Establishing INTERACT Ambassadors

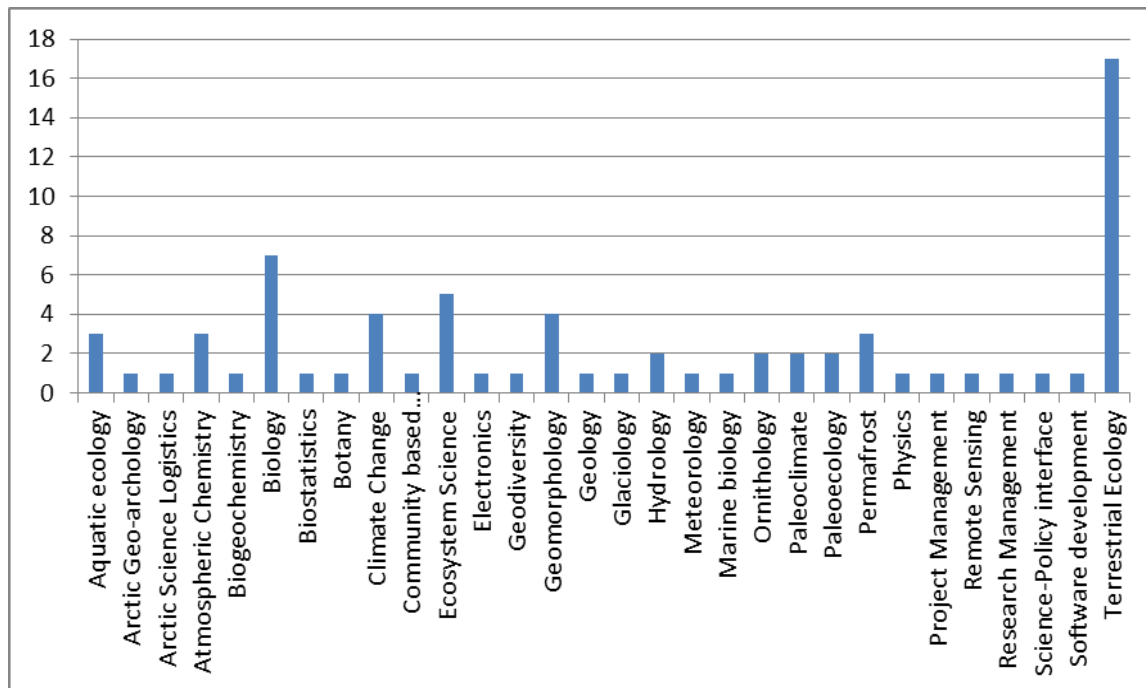
Identify a pool of science expertise from INTERACT's partners and Trans-national access community that can respond to requests from external organisations, consortia and networks for information, collaboration and representation from INTERACT

D2.9: A report on science expertise among INTERACT partners and ability to act as INTERACT Ambassadors (Month 9)



*The INTERACT Ambassadors
come from 16 different
countries*

- The survey identified 44 INTERACT Ambassadors from 16 countries covering a wide range of different topics.
- The next steps will be to implement the INTERACT pool of expertise to ensure continued information flow and collaboration with relevant projects and networks.
- This survey will be followed up by another survey among the Transnational Access users to further enhance and improve our pool of INTERACT Ambassadors.



the INTERACT Ambassadors cover a wide range of disciplines



Outreach



Dr. Stefan Reifner (l.) und Julia Eckert (r.) bedanken sich bei Prof. Terry V. Callaghan für seinen aufregenden und anschaulichen Vortrag.

Klimawandel nicht umzukehren

OLPE Prof. Terry V. Callaghan hielt aufregenden Vortrag mit sehenswerten Bildern

Auch wenn die Eisschmelze den Zugang zu Öl und Gas vereinfacht, wird sie vielen Menschen zum Nachteil gereichen, so das Fazit des Referenten.

Wie in Dramatische Bilder, aufleuchtende Worte: Der Vortrag, den die beiden Olper Lions-Clubs anlässlich des 100-jährigen Bestehens von „Lions International“ organisiert hatten, prägte sich ein. Referent Prof. Terry V. Callaghan erwies sich als Glücksgriff.

Die beiden Präsidenten der Olper Lions-Clubs, Julia Eckert (Lions-Club Olpe am Rupperts) und Dr. Stefan Reifner (Lions-Club Olpe-Kurftal), hatten rund 300 Zuhörer in der Olper Stadthalle begrüßt, nachdem die Hissensollen der Camerata Louis Spohr aus Düsseldorf den Vortragsmusikalisch eröffnet hatten. Unter den Zuhörern waren die Bürgermeister der drei Kommunen, in denen die beiden Lions-Clubs aktiv sind: Olpe, Wenden und Dreilagen, sowie Landrat Frank Beckebert. Dieser sowie Bürgermeister Peter Weber (Olpe) richteten Grußworte an die Gäste und lobten darin den Einsatz der beiden Lions-Clubs, von dem viele Menschen in

der Region profitieren. „Die Lions zeigen dem Gemeinwesen, ohne den unsere Gemeinschaft nicht weiterkommt“, so Weber. Dann übergriff Reifner das Wort an den Redner des Tages und schenkte dabei auf Englisch um Prof. Callaghan, renommierter Klimaforscher und als Mitglied des Weltklimarats von 2007 Mithras des Friedensnobelpreises, 108 schmelzende eisigen deutschen Satz erklängen, dass er kein Deutsch sprache. Zunächst dankte er seinen Gastgebern und betonte, wie herzlich er in Olpe aufgenommen worden sei und wie sehr ihm die Umgebung gefalle.

In seinem Referat zeigte er in Wort und Bild die weltweiten Folgen der Eisschmelze in der Arktis. Dabei sprach er Klare: Der Klimawandel sei vom Menschen beeinflusst. Auch wenn die Folgen des Klimawandels weltweit zu bemerken seien, die meisten sich dort am stärksten bemerkbar, wo Eis und Schnee die natürliche Umgebung bilden. Die Klimaschutzziele habe die Weltgemeinschaft bereits jetzt verfehlt, höchstens 2 Grad Anstieg seien angepeilt worden, 2,7 Grad seien es bereits jetzt. 1,5 Mill. Quadratkilometer Meeresniveau seien geschmolzen.

Neben vielen Nachrichten – er zeigte dramatische Bilder von Eisabbrüchen in der Grönland amerikanischer Millionenstädte, gewaltige Eisberge, die schmelzen, Tiere, die durch Umweltsterben – gebe es auch Vorteile, etwa erheblich vereinfachte

Schiffspassagen durch ehemals zugefrorenes Meer. Dr. Evarad Braganza, der den Kontakt zwischen den Olper Lions und dem Referenten möglich gemacht hatte, hatte in einer Nachschicht die erklenden Texte der Bilder ins Deutsche übertragen.

Die Schnee- und Eisschmelze sei doppelt dramatisch, einerseits weil das nicht mehr gebundene Wasser die Meerespiegel anhebe. Andererseits reflektierten Eis und Schnee das Sonnenlicht (Albedo), während Wasser, Erde und Gestein es aufnehme und somit die Klimaerwärmung weiter vorantreibe.

Dramatisch auch die Folgen für Permafrost-Regionen. Weil der eigentlich dauerhaft gefrorene Boden auftau, stürzen Häuser und Straßen zusammen, Seen trocknen aus.

Die Wissenschaft sei immerhin so weit, dass man den Klimawandel Vorreile bringen, etwa der Industrie, die einen einfacheren Zugang zu den Öl- und Gasreserven und Mithras Schiffspassagen nutzen könne, aber die Mehrheit der Menschen werde die Nachteile ertragen müssen, und das sei eine gewaltige Migration von Klimaflichtlingen, die zu erwarten sei.

Zahlreiche Zuhörer nutzten die Gelegenheit, Drillingen an den Wissenschaftler zu stellen, die dieser ausführlich und tiefgründig beantwortete. Mehrere bewegte die Frage, ob der Klimawandel denn aufhalten sei. Nein, so Callaghan, dafür sei es zu spät. Die Welt müsse damit leben, um den Klimawandel zu bewältigen, sei wissenschaftliche Diplomatie nötig, was bedeute, dass die Nationen sich gegenseitigen Zugang zu ihren Forschungsergebnissen gewähren und an den Klimafolgen so arbeiten, wie etwa an Bord der internationalen Raumstation ISS gearbeitet werde. Langer Applaus beendete den Vortrag, der mit einem abschließenden Musikstück der Camerata Louis Spohr zu Ende ging. Mit einem Strauß Blumen für seine Partnerin und regionaltypischen Lockenissen sagten die beiden Lions-Präsidenten Dank an den Referenten, der nicht nur kostenlos auftrat, sondern sogar seine Reisekosten selbst übernommen hatte und damit deutlich machte, dass er in einer Herzenzinsgelegenheit gekommen hatte.



Rund 300 Zuhörer waren in die Stadthalle gekommen, um den Vortrag des renommierten Klimaforschers anzuhören.



County Governor, Mayors, industrialists, in audience of 300, Town Hall, Olpe

Rector of Moscow State University, Deputy Minister of Education, 1,500 audience

Task 2.1c Matchmaking in science

Using the INTERACT pool of expertise, coordinate links between INTERACT and relevant atmospheric and marine networks in the North. Information flow and collaboration will be established via MoUs and via the INTERACT Ambassadors.

Leading partner: LU

On-going and continuous e.g INTAROS, International Advisory Board members etc.

Related to WP3 “awareness of the scene”

Acronym	Name	Type of organisation/ network/ programme	Develop method- ological standards	Geographical coverage	Topics covered	Duration	Link
CALM	Circum- polar Active Layer Monitoring	Long-term monitoring and data repository	Yes, measurement protocols	World-wide	Permafrost/ climate change	Open-ended	https://www2.gwu.edu/~calm/

Task 2.2. Promote Arctic and climate change issues in education

Establish communication between INTERACT science and European schools and universities.

Sub task 2.2a. To promote polar issues by providing educational resources within school organisations.

Use European educational portals, a short brochure, a promotional video clip for teachers, visits to schools, arrange meetings, and distribute newsletters for teachers with information on INTERACT's new resources and cooperate with the H2020 EDU-ARCTIC programme.

(Leading partner: IGF-PAS)

On-going




INTERACT is working with the UK Charity Wicked Weather Watch

Wicked Weather Watch · X

Secure | https://en-gb.facebook.com/pg/wickedweatherwatch/about/?ref=page_internal

Apps (617 unread) - terry_c



Wicked Weather Watch
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<http://wickedweatherwatch.org.uk>

MORE INFO

About
Wicked Weather Watch (WWW) is a charity that aims to provide clarity for children and young people about climate change and global warming.

STORY

We want children to have access to unbiased information and hope to bring the important issues to life for both children and their teachers.

We will be sharing the personal experiences of Arctic explorers, such as David Hempleman-Adams (pictured right), looking at the latest science and information, and asking how climate change is affecting the people and [wildlife of the Arctic and the rest of the world](#)

https://en-gb.facebook.com/pg/wickedweatherwatch/about/?ref=page_internal#unity

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Sub-task 2.2b Promote polar issues by providing educational resources within Universities

Awareness of INTERACT activities relevant to university courses, particularly the University of the Arctic, will be increased. These activities include guiding universities to information on projects at INTERACT stations, data availability for teaching, information on summer schools (together with APECS), and updating and expansion of the online mass outreach video course. The use of Webinars from stations using the Webex tool will be explored.

Leading partner: TSU representing the University of the Arctic

D2.15: Report on INTERACT educational resources for University of the Arctic (*Month 38*)



Sub-task 2.2c. Development of online educational resources and outreach for schools and universities

Improve INTERACT's online image gallery, linked to a glossary of Arctic environmental terms, and provide interactive components of two books on stories of Arctic science (one from TA projects 2011-2015, and the other from TA projects 2016-2018) together with associated thematic slide shows and video clips. Development of the science books will be closely linked to WP 5 output (UOULU).

(Leading partner: USFD (with IGF-PAS, TSU, UOULU), TSU)

D2.12: Enhanced gallery and glossary products with interactive component *(Month 24) In progress*

On-going with the web-site designed to link info.



Working with the charity *Wicked Weather Watch*: wicked experiments

Awesome Experiments



Arctic Climate Change

Less snow and ice: a warmer world?

You will need:

A thermometer
Cotton wool
Kitchen foil

A lamp / heat source
& black surface
Leaves, twigs, seedlings

1a) Does SNOW reflect or absorb heat?

Take the cotton wool – this represents **SNOW**.
Put the 'snow' under the lamp for 30 seconds.
Put the thermometer under the 'snow' and measure the temperature.
Write the temperature down.
Now place the leaves and twigs **on** the 'snow'. The leaves and twigs represent plants and other vegetation.
Leave for another 30 seconds then measure the temperature again.
Write the new temperature down. **Is it hotter, colder, or the same?**



1b) Does SOIL reflect or absorb heat?

Repeat the experiment above but this time using the black surface. This represents **SOIL**.
Take the temperature with and without the 'vegetation' on top of the 'soil' and record the temperature each time.
Is the temperature hotter, colder, or the same with the leaves and twigs on top?



1c) Does ICE reflect or absorb heat?

Repeat the experiment for a third time using the kitchen foil. This represents **ICE**.
Take the temperature with and without the 'vegetation' on top of the 'ice' and record the temperature each time.
Is the temperature hotter, colder, or the same with the leaves and twigs on top?



The science behind the results

Less snow and ice: a warmer world?

The temperature of the earth's surfaces has an impact on climate change. White surfaces such as snow and ice **REFLECT** (push away) heat, meaning that the surface stays cold. Dark surfaces such as soil, plants and water **ABSORB** (take in) heat, making the surface hotter.

The amount of light and heat reflected is called the **albedo**. White surfaces have a high **albedo**, and dark surfaces have a low albedo.



From our experiments we know that:

1a) **SNOW** insulates the ground. In the first part of the experiment, the temperature stayed the same when leaves and twigs were put on top.

1b) **SOIL** and bare rock absorb heat. In the second part of the experiment, the temperature was **THE SAME** when leaves and twigs were put on top.

1c) **ICE** reflects heat and cools the soil or sea underneath. In the final part of the experiment, the temperature **WENT UP** when leaves and twigs were put on top.

Why does this matter?

So far, the snowy, icy, shiny surface of the Arctic's lands and seas has cooled the Earth. But as ice and snow disappear, and as more plants grow, the Arctic reflects less and traps more heat and is warming the world. Less snow and ice in the Arctic matters for two main reasons:

1. The cycle of warming – the more ice melts, the more heat the Arctic traps, further warming the world. Then more ice melts, more heat is trapped and the earth gets warmer. This is called 'positive feedback' and means the earth gets hotter more and more quickly.
2. Animals and people that depend on ice and snow might lose their habitats, food and way of life.

More information about the science behind Awesome Experiments:

www.wickedweatherwatch.org.uk/kids

Wicked Climate Detectives

Wicked Climate Detectives

Arctic Climate Change

How did climate and weather change in the past?
Digging into ponds and peat bogs



You will need:

Plasticine or play dough
Card board roll such as the centre of a kitchen paper roll
Wooden kitchen spoon, knife or scissors
Artefacts shown on the next page which can be pictures or models.
(The RSPB sell small brooches that can also be used)

Preparation:

The teacher fills the cardboard tube with different coloured layers of plasticine/play dough with an artefact (shown on the next page) between each layer.

A hole is made at the top of the roll so that a wooden spoon handle can be inserted.

Note: it is possible to cut along the length of the roll to more easily insert the contents and then the roll can be sealed with sellotape or kitchen cling film.

The teacher demonstrates how to turn the "corer" into an imaginary sediment or peat. He/she then opens the tube, and starts to separate the layers starting at the bottom, the "oldest" layer. The class is asked what the artefact indicates.



Sometimes engines are used to core the tundra peat.

Sometimes ice on lakes is used to stand on to take cores from the lake bottom.



A real peat core showing layers built up over thousands of years



What will you find when you open the tube, taking layers from the bottom to the top?

A simple model of a coring device



What does a dung beetle mean? Cattle were present and so people were farming the area. The climate was warm and pleasant

What does burnt wood mean? There had been a forest fire or people had moved into the area. The climate was warm with thunderstorms.

What does an acorn mean? An oak forest had replaced the fir forest. The climate was warmer and drier

What does a fir cone mean? A fir forest had grown on or near the pond. The climate was cool and drier

What does a dragonfly mean? The pond was becoming smaller as reeds were there. Dragonflies need reeds above the water to lay their eggs on.

What does a fish mean? Long ago, there was a pond that did not freeze to the bottom in winter. The climate was cold and wet

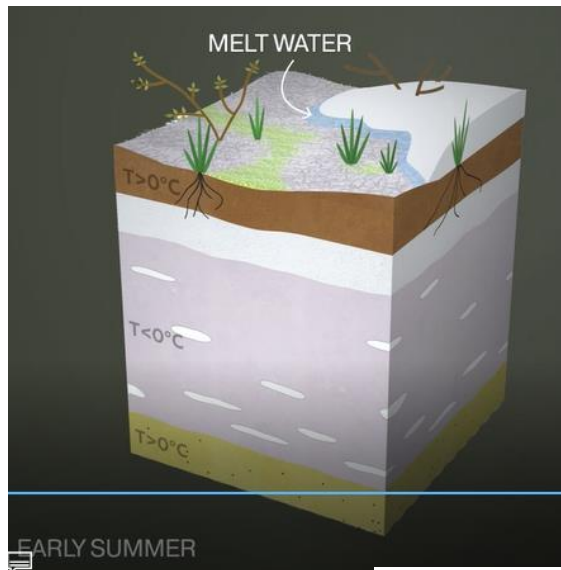
From the demonstration we know that:

- In peat and at the bottom of ponds, layers of soil and mud build up over thousands of years as small animals and plants die and drop to the bottom, as leaves fall, and as rain washes soil and dead material into the lake
- We know how old the layers are from hi-tech measurements of carbon atoms
- What is preserved in the peat and mud (sediment), tells us what the weather and environment were like in the past because some plants and animals are very particular about where they live.
- Knowing about past changes in our environment helps us to understand what will happen to where we live as climate changes in the future.

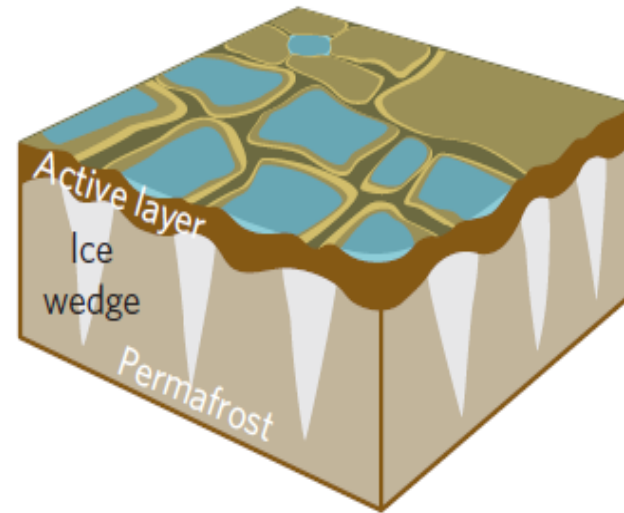
Note for teachers. The layers and transitions are illustrative only. In practice, it is microfossils that remain such as pollen grains and invertebrate skeleton parts.

For more resources and information on the science visit
www.wickedweatherwatch.org.uk and www.eu-interact.org

Developing example animations

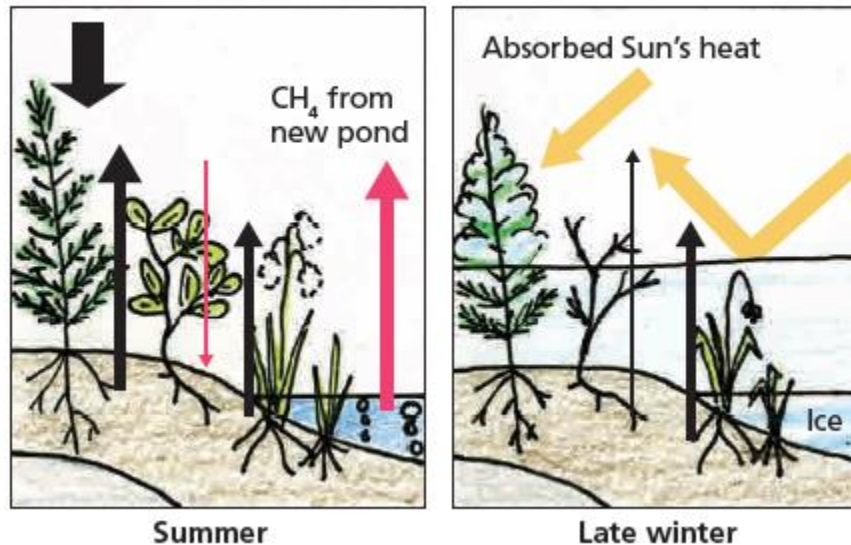


Permafrost dynamics



Patterned ground

Warming climate



Trace gases and albedo

Sub-task 2.2d. Feedback on INTERACT educational resources

Evaluate the usefulness of resources for education on Arctic and northern issues by conducting 3 evaluation questionnaires for teachers and reporting on a) teachers' expectations and needs, b) the usefulness of INTERACT's materials, and c) recommendations for future development of educational resources.

The surveys will be Computer Assisted Web Interviews (CAWIs).

(Leading partner: IGF-PAS)

D2.2-4: Three CAWI survey reports (i.e. Computer Assisted Web Interviews) Months 12, 24, 36 *First report published*



1st CAWI Survey Report

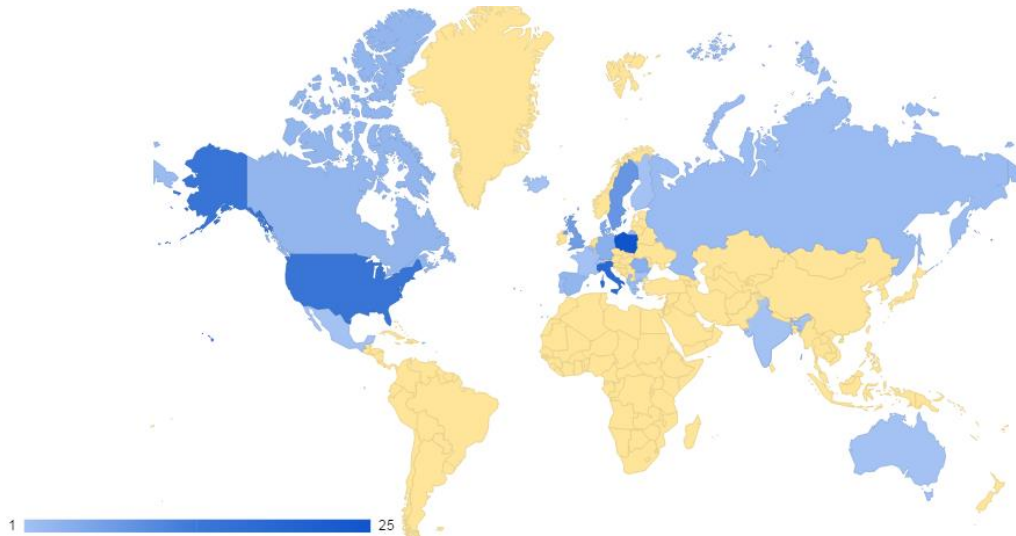
- The study was conducted in May and June 2017
- It was the first of 3 surveys designed to collect feedback from teachers and support the development of new educational resources, which will be created within the Project

The aim

- The aim of this study was to recognize science teachers and polar educators' needs and expectations in relation to new educational materials about the Arctic
- The survey was published on-line and consisted of 16 questions
- The total number of replies was 113, from 25 countries
- The results allow us to assess various priorities for producing educational materials, and to understand at what levels and how they will be used

The respondents

- Teachers from all levels of education; „secondary school” was the most common answer
- 2/3 claim a long work experience (>15 years)
- Represent 25 countries from 4 continents

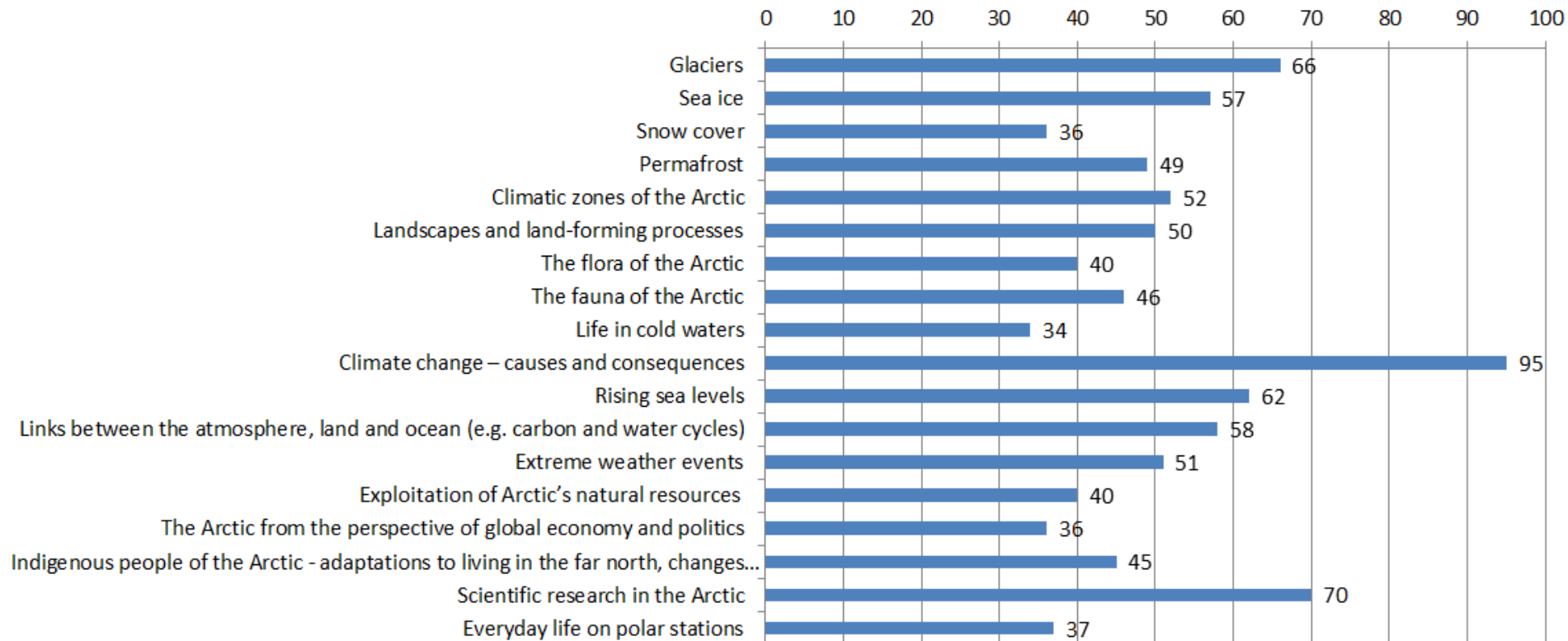


The answers

- New educational materials will be used mainly on geography, nature, and biology lessons, during regular school hours (66%) and additional lessons (51%);
- More than 2/3 of science teachers can devote little or very little time to introduce polar topics;
- The most desirable types of new educational materials are “Multimedia presentations – PowerPoint”, “Movies”, and “Graphics and schemes”;
- “Websites/ web portals” are considered the most useful way of communication between educational projects and teachers.

Most interesting topics

Number one: „Climate change – causes and consequences”



Recommendations for authors

- New resources need to be very efficient in presenting relevant material quickly;
- A particular attention should be paid to the attractiveness of materials;
- Part of the materials should be designed for use during school activities other than regular lessons, for example parenting hours or Oxford-style debates (e.g. topics for discussion – related to polar issues);
- Part of the materials need to be related to STEM subjects in general, but with a connection to polar issues (e.g. a material on magnetism with a mention of northern lights, or a material on tectonics with examples from Iceland).

Remaining Deliverables

D2.1: Report summarising feedback from target end users concerning ways to extend the educational value of INTERACT's Arctic gallery and glossary (*Month 12*) .

Delayed until sufficient resources have been developed: now Month 48

D2.5: Recommendations to authors of educational resources (*Month 36*)

D2.6-8: Three newsletter issues for teachers once new resources have been delivered (*Month 13, 25, 37*)

D2.6-8: Three newsletter issues for teachers once new resources have been delivered (*Month 13, 25, 37*)

D2.10: Report of INTERACT Science Stories 1 (2011-2015) with interactive format embedded (*Month 18*) *In progress*

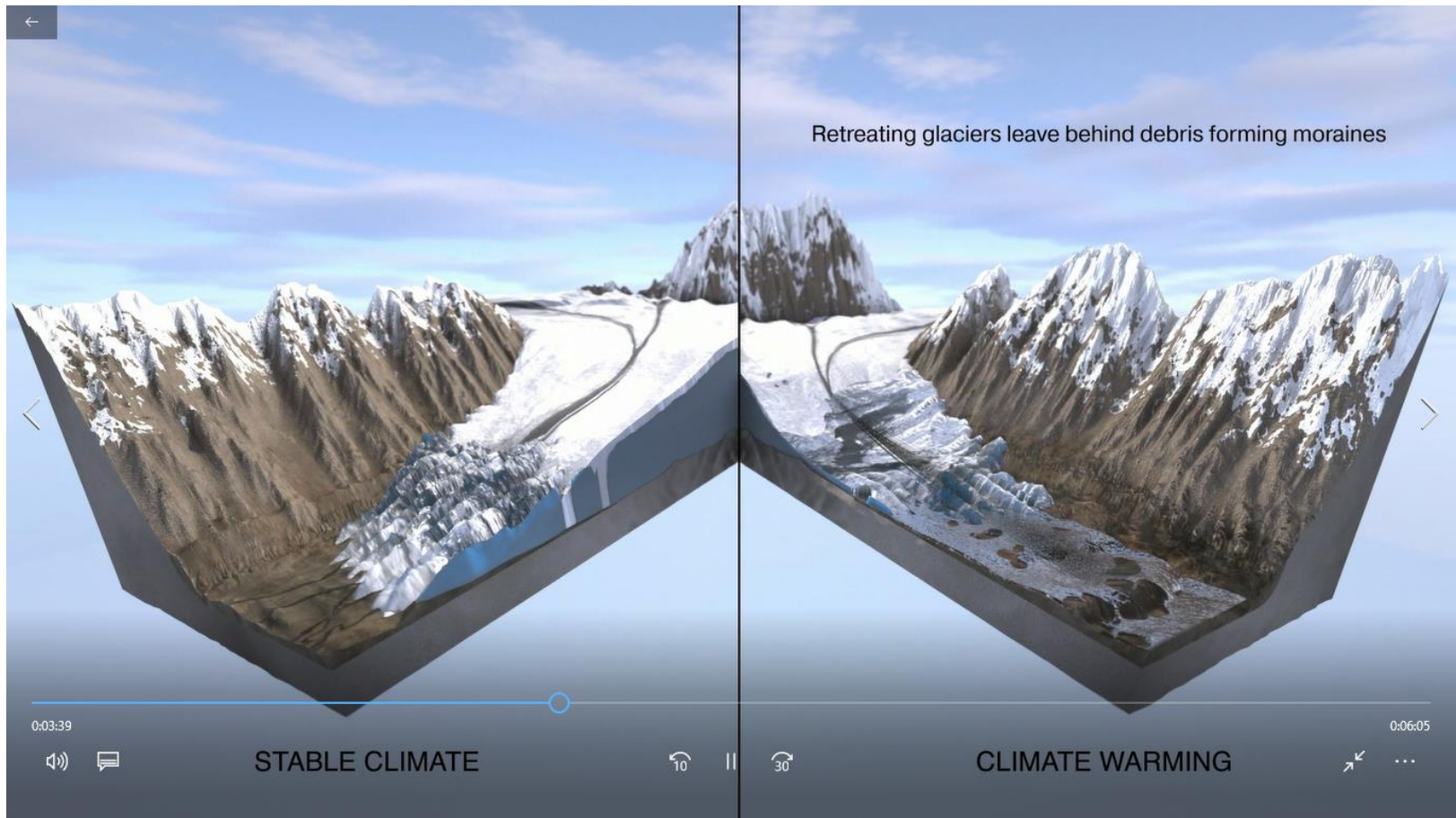
D2.11: Report of INTERACT Science Stories 2 (2016-2018) (*Month 48*)

D2.13: Promotional brochure and video clip (*Month 24*)

D2.14: Series of infographics (*Month 36*)

MS2.2. *Up-dating and expansion of the online Coursera video course “The Changing Arctic” Month 36*

The ambition is very high!



Coursera course “The Changing Arctic”