WP 2

Scientific coordination, mentoring and education

USFD LU UOULU TSU IGF/PAS

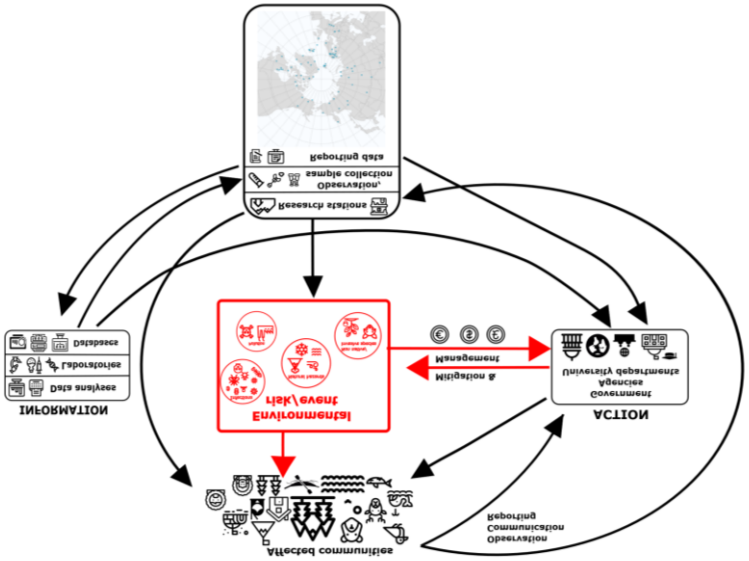
Specific aims:

- 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

Up-dates since the Svalbard Meeting

Mentoring and supporting in general

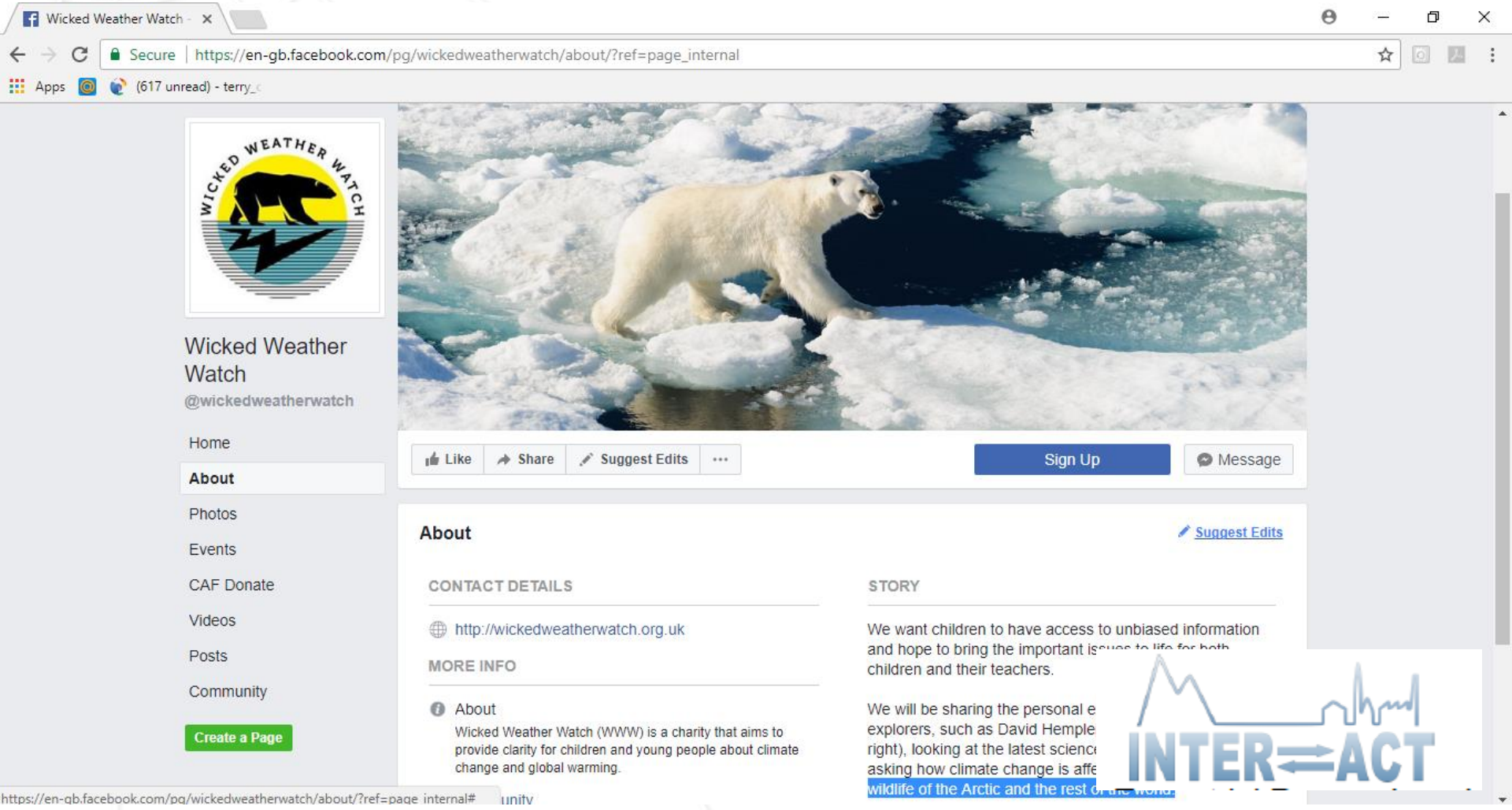
- WP1- Bulletin board established on the web site advertising facilities for mentoring on a range of science topics
- WP3 - Awareness of the Scene
- WP4 - Chair of TA Board – suggesting priority topics
- WP6 - Systems approach
- WP9 - Meeting of decision makers, local peoples and researchers; developing paper



INTERACT

Promoting Arctic and climate change issues in education

INTERACT continues to work with the award-winning UK Charity Wicked Weather Watch



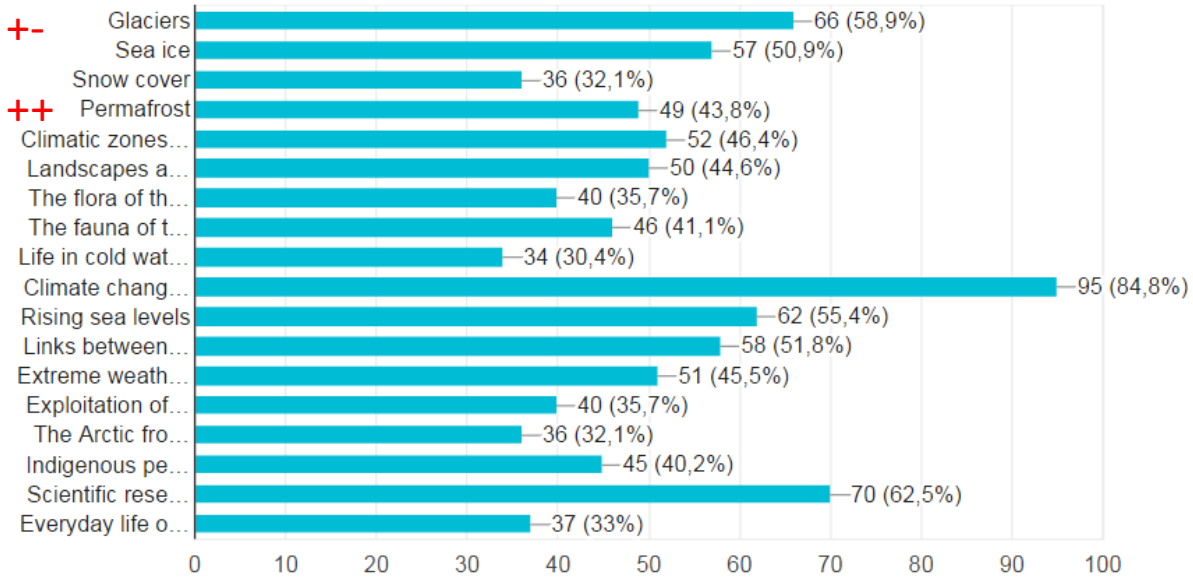
Sub-task 2.2c. *Development of online educational resources and outreach for schools and universities*

Process for animation development

1. Identification

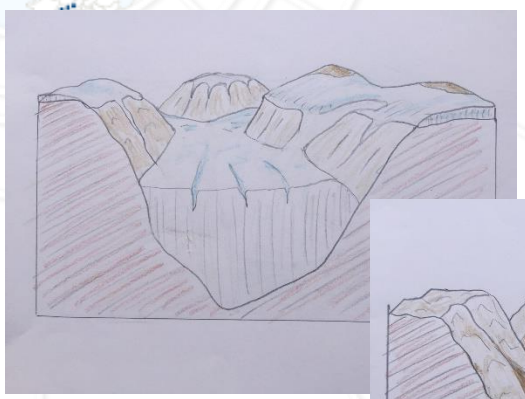
(PAS, UOULU)

(PAS) CAWI surveys, direct contact with teachers and teacher associations, through Wicked Weather Watch, Science Stories, searches



Results of CAWI survey I

2. Development (USFD, TSU)



3. Progress

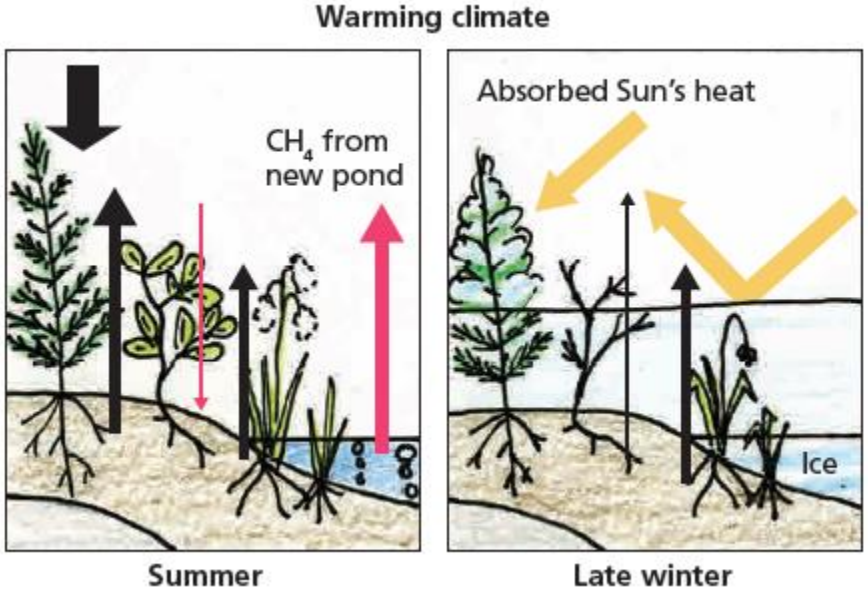
Completed

– General permafrost dynamics

- Ice wedge polygons
- Glacier dynamics

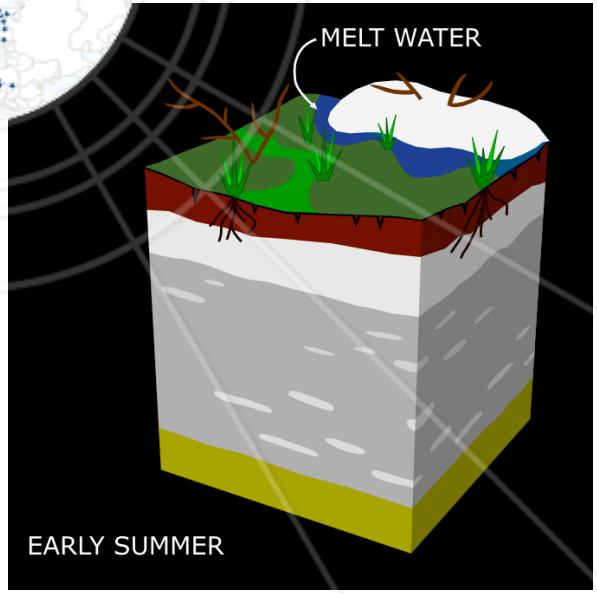
In development

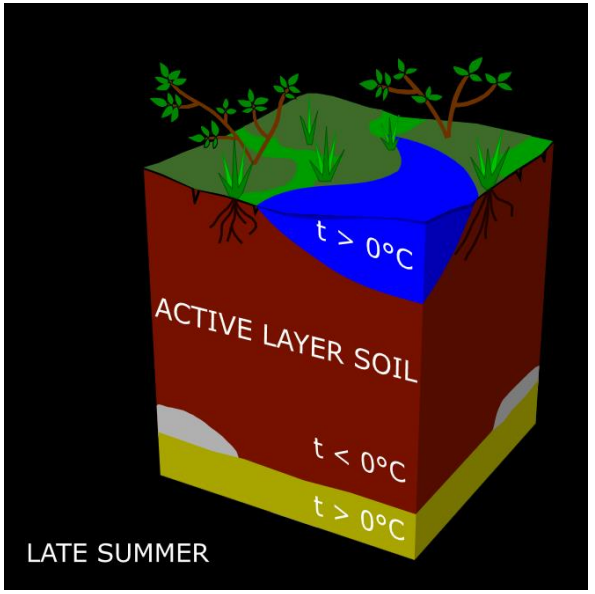
- Hanging valley formation
- Understanding past climate changes
- Land-surface feedbacks

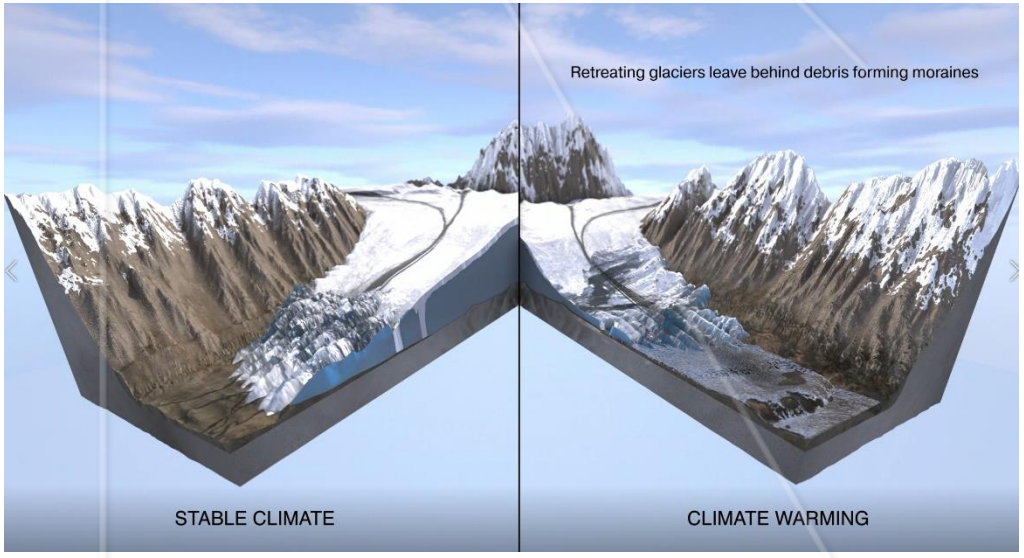


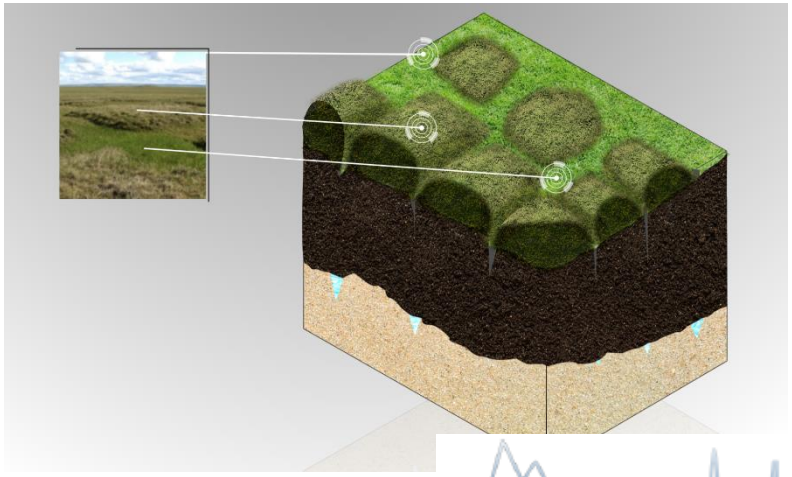
Ca. 25 more resources needed!

Completed


MELT WATER
EARLY SUMMER


t > 0°C
ACTIVE LAYER SOIL
t < 0°C
t > 0°C
LATE SUMMER


Retreating glaciers leave behind debris forming moraines
STABLE CLIMATE
CLIMATE WARMING



Multiple educational stages: “Wicked Climate Detectives” developed to undergraduate level

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 broaches 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:

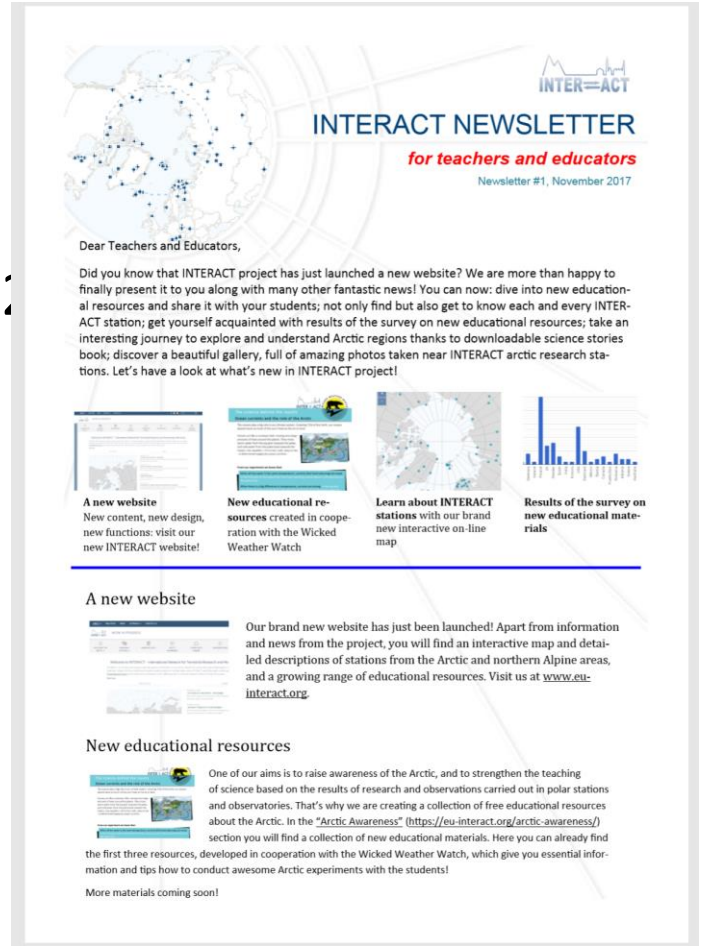
- In peat and at the bottom of ponds, layers of soil and mud build up over thousands of years as small animals and plants die and drop to the bottom, as leaves fall, and as rain washes soil and dead material into the lake
- We know how old the layers are from hi-tech measurements of carbon atoms
- What is preserved in the peat and mud (sediment), tells us what the weather and environment were like in the past because some plants an 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.wickedwetherwatch.org.uk and www.eu-interact.org

4. Dissemination

- Web sites – stand alone
- Web sites – packages
- i-book INTERACT Science Stories Volume 2
- Up-dated Mass on-line Course
- Summer schools
- European educational portals
- A short brochure
- A promotional video clip for teachers
- Visits to schools
- Meetings including teachers associations
- Newsletters for teachers
- Cooperation with the H2020 EDU-ARCTIC programme and Polar Educators.



INTERACT NEWSLETTER

for teachers and educators

Newsletter #1, November 2017

Dear Teachers and Educators,

Did you know that INTERACT project has just launched a new website? We are more than happy to finally present it to you along with many other fantastic news! You can now: dive into new educational resources and share it with your students; not only find but also get to know each and every INTERACT station; get yourself acquainted with results of the survey on new educational resources; take an interesting journey to explore and understand Arctic regions thanks to downloadable science stories book; discover a beautiful gallery, full of amazing photos taken near INTERACT arctic research stations. Let's have a look at what's new in INTERACT project!

A new website New content, new design, new functions: visit our new INTERACT website!

New educational resources created in cooperation with the Wicked Weather Watch

Learn about INTERACT stations with our brand new interactive on-line map

Results of the survey on new educational materials

A new website

Our brand new website has just been launched! Apart from information and news from the project, you will find an interactive map and detailed descriptions of stations from the Arctic and northern Alpine areas, and a growing range of educational resources. Visit us at www.eu-interact.org

New educational resources

One of our aims is to raise awareness of the Arctic, and to strengthen the teaching of science based on the results of research and observations carried out in polar stations and observatories. That's why we are creating a collection of free educational resources about the Arctic. In the "Arctic Awareness" (https://eu-interact.org/arctic-awareness/) section you will find a collection of new educational materials. Here you can already find the first three resources, developed in cooperation with the Wicked Weather Watch, which give you essential information and tips how to conduct awesome Arctic experiments with the students!

More materials coming soon!

Contents of the educational package

Main:

- Animation, and/or
- Powerpoint presentation;

Accompanying:

- Instructions for teachers;
- Worksheets with tasks for students;
- Games, quizzes, crosswords, on-line tests, photos, short videos, etc.

Suggested types of packages

- Permafrost Done
- Glacier dynamics 100% complete
- Climate change – causes and consequences
- Links between the atmosphere, land, and ocean (eg. carbon and water cycles) 25% complete
- Fauna of the Arctic
- Landscapes and land forming processes 25% complete
- Sea ice
- Indigenous People of the Arctic
- Scientific research in the Arctic 10% complete

Help with identifying existing resources welcome!

Outreach

Dr. Stefan Reißner (l.) und Jutta Eckert (r.) bedankten sich bei Prof. Terry V. Callaghan für seinen aufrüttelnden und anschaulichen Vortrag. Foto: wtn

Klimawandel nicht umzukehren

OLPE Prof. Terry V. Callaghan hielt aufrüttelnden 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.

wtn ■ Dramatische Bilder, aufrüttelnde 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, Jutta Eckert (Lions-Club Olpe am Biggisee) und Dr. Stefan Reißner (Lions-Club Olpe-Kurkölln), hatten rund 300 Zuhörer in der Olper Stadthalle begrüßt, nachdem die Bläsersolisten der Camerata Louis Spohr aus Düsseldorf den Vormittag musikalisch eröffnet hatten. Unter den Zuhörern waren die Bürgermeister der drei Kommunen, in denen die beiden Lions-Clubs aktiv sind, Olpe, Wenden und Drolshagen, sowie Landrat Frank Beckehoff. 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 profitierten. „Die Lions zeigen den Gemeinsinn, ohne den unsere Gemeinschaft nicht weiterkommt", so Weber.

Dann übergab Reißner das Wort an den Redner des Tages und schaltete dabei auf Englisch um. Prof. Callaghan, renommierter Klimaforscher und als Mitglied des Weltklimarats seit 2007 Mitträger des Friedensnobelpreises, ließ schmunzelnd als einzigen deutschen Satz erklingen, dass er kein Deutsch spreche. 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 Klartext: Der Klimawandel sei vom Menschen beeinflusst. Auch wenn die Folgen des Klimawandels weltweit zu bemerken seien, sie machten 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. 3,5 Mill. Quadratkilometer Meereseis seien geschmolzen.

Neben vielen Nachteilen – er zeigte dramatische Bilder von Eisabbrüchen in der Größe amerikanischer Millionenstädte, gewaltige Eisberge, die schmelzen, Tiere, die durch Umwelter storben – gebe es auch Vorteile, etwa erheblich vereinfachte Schiffspassagen durch ehemals zugefrorene Meere. Dr. Everard Braganza, der den Kontakt zwischen den Olper Lions und dem Referenten möglich gemacht hatte, hatte in einer Nachtschicht die erklärenden Texte der Bilder ins Deutsche übertragen.

Die Schnee- und Eisschmelze sei doppelt dramatisch, einerseits, weil das nicht mehr gebundene Wasser die Meeresspiegel 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 auftaue, stürzten Häuser und Straßen zusammen, Seen trockneten aus.

Die Wissenschaft sei immerhin so weit, dass man den Einwohnern von Florida recht sicher voraussagen könne, wann sie weggehen müssten.

Für viele werde der Klimawandel Vorteile bringen, etwa der Industrie, die einen einfacheren Zugang zu den Öl- und Gasreserven und kürzere Schiffspassagen nutzen könne, aber die Mehrzahl der Menschen werde die Nachteile ertragen müssen, und das sei eine gewaltige Migration von Klimaflüchtlingen, die zu erwarten sei.

Zahlreiche Zuhörer nutzten die Gelegenheit, Detailfragen an den Wissenschaftler zu stellen, die dieser ausführlich und fachkundig beantwortete. Mehrere bewegte die Frage, ob der Klimawandel denn aufzuhalten 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 gewährten und an den Klimafolgen sogar arbeiteten, wie etwa an Bord der internationalen Raumstation ISS gearbeitet werde. Langer Applaus beendete den Vortrag, der mit einem abschließenden Musikerlebnis der Camerata Louis Spohr zu Ende ging. Mit einem Strauß Blumen für seine Partnerin und regionaltypischen Leckereien 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 Herzensangelegenheit gesprochen hatte.

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

Reaching out to Russian Ministers of Education and Environment

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

INTER=ACT

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***

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

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

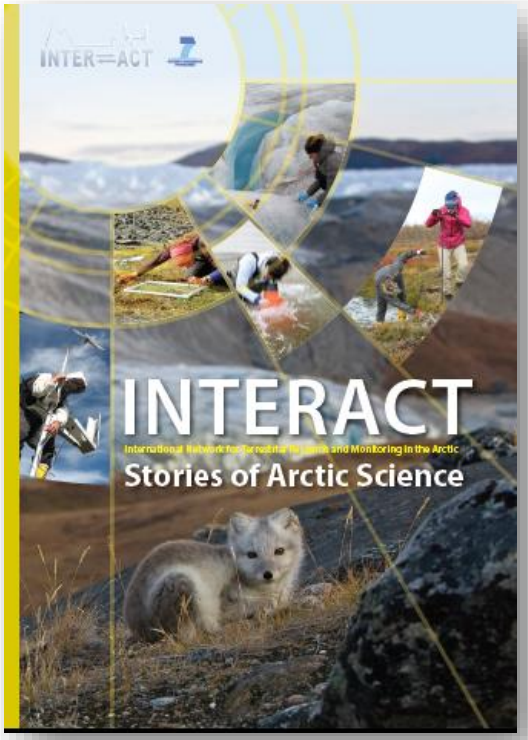
D2.6-8: Three newsletter issues for teachers once new resources have been delivered *(Month 13, 25, 37)*

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

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*

Thank you for your attention!