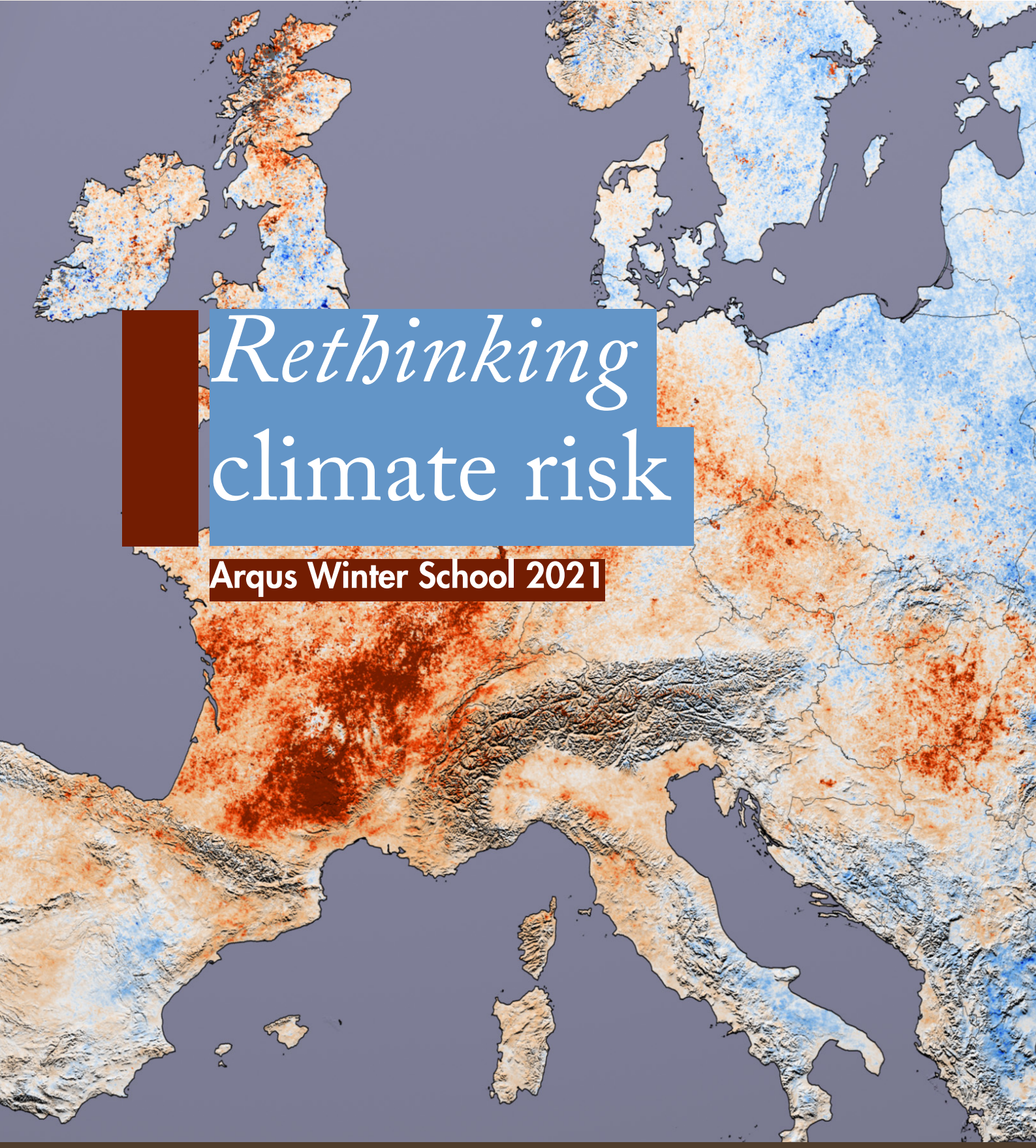

Rethinking climate risk

Arqus Winter School 2021

arQus

European University Alliance

Welcome to the Arqus European University Alliance!

Welcome! By taking this course you are taking part in a wider initiative to build bridges between European Universities as part of the Arqus European University Alliance: https://www.arqus-alliance.eu. In this course you are joining a class of students from across seven European universities.

The Arqus Alliance brings together the universities of Bergen, Granada, Graz, Leipzig, Lyon, Padova and Vilnius, seven longstanding comprehensive research universities who share extensive experience in joint projects and a common profile as internationalized institutions with deep regional engagement in medium-sized cities.

The principal ambition of the Arqus Alliance is to act jointly as a laboratory for institutionally designing, testing and learning about innovative models of deep inter-university cooperation.

The Alliance's vision is to build on the member universities' sound prior experience in cooperation in order to achieve a high level of integration in its members' policies and action plans in order to:

- Enhance the education of critically engaged European and global citizens who are able and willing to contribute to a multicultural, multilingual and inclusive Europe which is open to the world.
- Increase and improve the joint research capacity of the partner universities.
- Better respond to the grand societal challenges of the 21st century in Europe and beyond.

We hope that through this course we will critically engage you as European and global citizens, in thinking about how to study and respond to the grand challenges facing Europe today.

Cover Image: The European Heat wave of 2003 by Reto Stöckli, Robert Simmon and David Herring, NASA Earth Observatory, based on data from the MODIS land team

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Engaged European Citizens

The Arqus Winter School is the beginning of a unique educational journey. It will engage you as students in thinking about what it means to be a European Citizen, and how this citizenship is being galvanized around societal challenges; from pandemics, to global climate change, or in evolving to a more diverse and mixed society. It is a challenge-based approach to educating critically engaged European citizens, and it is being run in parallel at all seven Arqus universities this semester. The course is designed to facilitate interaction and learning between students at the different universities at certain junctures, starting with the winter school.

Traditionally, concepts of citizenship have been connected to notions of territory and statehood and the implicit or explicit rights and responsibilities of people who live there. European citizenship necessitates reimagining this concept, moving away from concrete geographical boundaries and toward more abstract ideas and ideals such as peace, prosperity and equality. This radical new way of thinking about citizenship demands conversations about what our rights and responsibilities are as European citizens, and what they should be. In the 21st century, active European citizenship necessitates engagement with complex global challenges.

Contemporary universities have the power to make substantive contributions to discourses and models of active, engaged citizenship by developing interdisciplinary, challenge-based and student-led pedagogies that empower students to critically reframe, reflect upon and address the challenges we face today.

This introduces four key principles around which this course is designed:

- *Engaged citizenship*: This course starts from the idea that abstract notions of European citizenship are being activated and made more concrete around challenges, which provide tangible discussions of the rights and responsibilities of European citizens. For example, under the COVID-19 Pandemic, responsible citizenship is tied to adhering to government recommendations on

wearing masks or keeping physical distance. How we engage with the grand challenges of our time helps define citizenship.

- *Challenge-based research:* This course engages with social challenges by enabling you as students to conduct group research projects into how challenges take shape in the places they live. This is a mode of research that begins from the complex, uncertain and politically contested nature of these challenges, rather than pushing these things to the side. It adopts a critical perspective for making sense of what is going on, and a normative perspective for thinking what should be done to address the challenge.
- *Transdisciplinarity:* The complexity and interconnectedness of the challenges facing Europe, and the significant uncertainties they pose, mean that no one scientific discipline or field can claim to have the overview. We can more comprehensively and fairly make sense of these challenges by bringing together complementary perspectives – from formal scientific disciplines but also other knowledge systems like traditional knowledge – to develop creative research frames and methods.
- *Student-led:* This course is designed to support you as students in your groups, to enable you to conduct your own independent, transdisciplinary research project. In this way, you will have the opportunity to steer your own learning according to your interests and needs in conceptualizing, carry-out and completing a piece of research.

Rethinking Climate Risks

The Arqus Winter School kicks off this year's Arqus challenge-based learning programme which looks at how European citizens are engaging with the impacts of global climate change in the places they live; how various institutions and groups of people are defining and responding to 'climate risks'. The rapidity and complexity of linked climate and other changes are destabilising communities' long-held understandings and practices of managing risks; from storms, to heatwaves or floods. There are increasing cases where these rapid changes are shaking key institutions (like municipalities) claims to control these risks and undermining public trust in them. Europe's cities are being forced to (re-)build institutions for governing a new class of risks beyond their experience. Rethinking risk implicates a great many disciplines and professions, and demands vigorous public debate.

For example, recent flooding in one Western Norwegian city saw public scrutiny into how the municipality planned for flooding events, and how a projected increase in rainfall might totally undermine their planning and engineering calculations. Though the city has long lived with the normal rhythms of flooding, climate scientists are telling this community that they will face rainfall and flooding that is far beyond their experience. In response, some groups put forward drastic plans for controlling the nearby river with hydro-power works, but this river is protected for its outstanding natural and recreational value, so these plans are controversial. Critics highlight the high uncertainties about both climate projections, and whether increased rain necessarily results in increased flooding? We see how climate risks have, in this case, opened up heated public debates in the municipality about what the river means for the people of this city, and the heightened levels of flooding risk they may have to live with. In these debates, local residents are engaged in key decisions around what worldviews, risk aversion, values and practices are important for their community.

This semester you will form interdisciplinary research groups, tasked with conducting a piece of independent research into the risks of climate change that are recognised and governed for in the city where you study. Where your group puts its focus, and how you conduct your research will be up to you. But all groups' work will share three common features:

- Concern for how climate risks are addressed by local institutions
- Combining *descriptive* scientific study and *normative* attention to what ought to be done (e.g. policy recommendations)
- Comparison with cases across Europe; groups interact across Arqus universities.

To support you in conducting your research projects, this course runs in three broad phases:

- *The winter school*: This is a one-week intensive session for a sub-set of students enrolled in the course at the seven universities, to kick-off the research projects and invest these students with some of the concepts, methods and competences for leading transdisciplinary research on the theme of changing climate risks in their own cities. It maps climate risks in each Arqus city.
- *The challenge-based learning programme*: Following the winter school, students form research groups at their home universities, to conduct research projects over the semester. As on-going support to this project work, groups at all Arqus universities will access short, recorded lectures and other resources on a common Moodle online learning platform, about the theme of climate risks, and methods and tips for research. This will also be a platform for student groups to compare and review each other's projects across Arqus universities.
- *The student-led forum*: As student groups come to finish their research projects, we will facilitate a platform where students can compare findings and distil key lessons for engaged European citizenship around climate risks.

The Winter School

The winter school kicks off this semesters course on 'Engaging European citizens for re-thinking climate risk' as part of the Arqus Alliance. It has been developed by an academic committee of researchers from across the seven Arqus universities, convened by the University of Bergen. It draws on a Moodle platform of resources set up by the University of Graz.

The winter school brings together six students from each of the seven Arqus universities. It aims to invest these students with interdisciplinary research ideas, skills and resources to enable them to develop group research projects on climate risk in each Arqus city. At some universities the six winter school participants might be the only ones taking this course, while at others the six students might be part of a larger class, and they will need to form research groups and relate their experiences to others in their class.

The school is a five-day, intensive, interactive and interdisciplinary course creating the conditions for students to learn about and reflect on climate risks, to relate it to students in their home city, and begin putting together a mixed set of methods and tools for conducting a research project. Participating in the school ensures students develop working knowledge of:

- Climate impacts, risks and vulnerability; from the city up to the European scale.
- What climate risks mean for engaged European citizenship.
- Conducting transdisciplinary research.

The winter school was originally designed to convene 42 students together for a week at a cabin in the Norwegian mountains. But current restrictions on travel and conducting physical classes associated with the on-going pandemic meant that this course was forced into a virtual or hybrid mode. This means that, depending on the regulations at each Arqus university, students may be able to sit together as a group, or individually take part in the school virtually from home.

We have designed the winter school with this hybrid format in mind, particularly by creating space for interactive work among students,

within and across Arqus universities. The winter school is designed as a first mapping of climate risks in the Arqus cities, with a regard for climate risks and vulnerability at the regional European scale.

Winter school students undertake carefully designed workshop exercises each day, which 'map' local climate risks in different ways; through creative presentations (Monday), interpreting maps of climate projections (Tuesday), drawing risks as systems diagrams (Wednesday), imagining European risk scenarios (Thursday), or discussing principles of citizenship under climate change (Friday). Together these exercises build a composite picture of actual and projected risks and their management in each city.

The planned output is that the sets of maps developed in each city will be assembled together into a common portfolio of the seven Arqus cities, as a draft *'Atlas' of climate risks at different points of Europe*. The very concrete intention of this Atlas is as a resource for helping student groups to focus and frame their research projects after the winter school.

Programme of the Arqus Winter School 2021

Day	Monday Feb 22nd	Tuesday Feb 23rd	Wednesday Feb 24th	Thursday Feb 25th	Friday Feb 26th
Theme	**Rethinking climate risk and science**	**Mapping the natural causes of climate risk**	**Making connections: climate risk and social transformation**	**Scenarios of responding to climate risk**	**Climate risk and European Citizenship**
Morning plenary	**0900–1200 (CET)** *Official welcome to the Arqus Winter School* *A short round of introductions to all seven ARQUS institutions* **Framing the winter school: studying sustainability and citizenship in an uncertain world** Jakob Grandin, University of Bergen **European citizenship, environmental challenges and populist discourse in perspective** Pietro De Perini, University of Padova *Short break* **Transdisciplinary ways of studying climate risks (double lecture)** Scott Bremer, University of Bergen & Silke Beck, University of Leipzig **Moderated discussion** **Brief intro to the workshop**	**0900–1100 (CET)** *Intro to the day's theme by moderator* **High Risks from Climate Change** Douglas Maraun, University of Graz **The impact of climate change on the risk of flooding** Andrea D'Alpaos, University of Padova *Short break* **Climate change and habitat shifts. Who are the winners?** Alius Ulevičius, Vilnius University **Global warming in the coastal strip: from the origin to the impact mitigation interventions assessment of scenarios** Miguel Ortega Sánchez, University of Granada **Moderated discussion**	**0900–1100 (CET)** *Intro to the day's theme by moderator* **How climate risks emerge from connections between natural and social worlds (double lecture)** Scott Bremer, University of Bergen & Silke Beck, University of Leipzig **Individualisation of risk and implications for future climate risks** Christian Kuhlicke, University of Leipzig *Short break* **Challenging Chronos to Face Climate Change** Sacha Loeve and Bernadette Bensaude-Vincent, Lyon University **Moderated discussion**	**0900–1100 (CET)** *Intro to the day's theme by moderator* **Disruptive, top-down policy mixes for rapid decarbonization** Alfred Posch, University of Graz **Bottom-up grassroots initiatives for climate change mitigation and adaptation** Ilona Otto, University of Graz *Short break* *Panel Discussion*: **Governing climate risk** a) Stina E. Oseland, climate director, Bergen Municipality b) European Environmental Agency c) Alfred Posch/Ilona Otto, University of Graz	**0900–1100 (CET)** *Arqus Forum on European Citizenship 2020:* **Changing conceptions of citizenship and collective identity in the context of climate change** Pawel Karolewski, University of Leipzig **Shooting for the stars: keys to enhancing citizenship to mitigate climate risks** Ozana Olariu, University of Granada *Short break* **The law of climate change and public/citizen participation** Isabelle Michallet, Lyon University **How Fairness Considerations are Relevant for Effort-Sharing in Responding** Lukas Meyer, University of Graz **Moderated discussion** **Brief intro to the workshop**
	12–12.30 (CET) Break	**11–11.30 (CET) Break**	**11–11.30 (CET) Break**	**11–11.30 (CET) Break**	**11–11.30 (CET) Break**
Workshop session 1	**12.30– (CET): workshop** **Local group work:** Creatively introducing cities and its climate risks. Students organize themselves this afternoon.	**11.30–12.30 (CET):** **workshop session 1** **Brief intro to the workshop** Local group work: interpreting maps of climate risks.	**11.30–12.30 (CET): workshop session 1** **Brief intro to the workshop** Local group work: Systems mapping of the processes combining in 'creating climate risks'	**11.30–12.30 (CET): workshop session 1** **Brief intro to the workshop** Inter-university group work: plotting future scenarios of climate risks at a European scale	**11.30–12.00 (CET):** **Workshop session 1** **Individual reflection** Individually students reflect on principles of engaged citizenship under climate risk
	Lunch	**12.30-13.15 (CET): Lunch**	**12.30-13.15 (CET): Lunch**	**12.30-13.15 (CET): Lunch**	**12.00 - 12.45 (CET) Lunch**
Workshop session 2	**Continue workshop exercise**	**13.15-14.30 (CET):** **workshop session 2** Continue interpreting maps of climate risks and preparing presentation	**13.15-14.15 (CET):** **workshop session 2** Continue systems mapping and preparing presentation.	**13.15-14.30 (CET):** **workshop session 2** Continue plotting scenarios and preparing presentation	**12.45 – 14.15 (CET): workshop session 2** Inter-university group work: Engaging with climate risk – principles of European citizenship under climate risk
Afternoon plenary	*None*	**15–16 (CET): Plenary discussion** In plenary students share: (i) their creative introduction to risks in their city (Mon); and (ii) one map describing processes behind these risks (Tue).	**14.30–16 (CET): Communication and dissemination workshop:** Local groups preparing a communication strategy related to their systems maps.	**15–16 (CET): Plenary discussion** In plenary, students share their (i) systems maps (Wed) and (ii) scenario work (Thu)	**14.30–15.30 (CET): Ending of the winter school**

Technical details

Plenary lecture sessions

Each day the winter school starts with a plenary lecture session running from 09.00 – 11.00, with the exception of Mondays session which will run until 12.00. This 'webinar' will be held on a Zoom platform, convened by Scott Bremer and Jakob Grandin at the University of Bergen. All 42 winter school participants and lecturers will have the active status of 'panelists' and will receive an email with their own unique link for each webinar, a few days before the school. As panelists, participants can question or comment on the lectures by registering that they have a comment (use !) or question (use ?) in the chat box, and being invited by the facilitator to speak. The lecture sessions will also be open to people not attending the winter school, who will join the webinar only as observers using a non-unique link, and without the possibility of interacting. Lecture sessions will have a break in the middle and at the end.

Afternoon workshops

After the lecture sessions, winter school participants alone will take part in group exercises in workshops. These will also take place on Zoom, and participants and lecturers will receive a common log-on link for each workshop. These workshops will always start in plenary with instructions from an expert, before participants are split into seven different 'break-out groups' to complete the exercise. Participants will sometimes be grouped by university (Monday to Wednesday's workshops) and sometimes as mixed groups comprising participants from different Arqus universities (Thursday and Friday's workshops). Each university has allocated facilitator(s) for the student groups at that university, who will support during the workshop activities. In addition, the expert(s) who present each exercise will also cycle around the break-out groups and offer advice or support as necessary.

Sharing sessions

At the end of the day (15.00 – 16.00) on Tuesday and Thursday, student groups will present what they produced in the workshops to each other. Here again these sessions will run on Zoom, with participants and lecturers all receiving a common log-on link for each sharing session. Students will have the possibility of presenting through Zoom, and/or depositing their presentation on the common Moodle platform for other groups to look at.

The Moodle platform

All participants have been invited via an email to work on a winter school Moodle platform at the University of Graz. On this platform, participants will have access to resources and be able to share material across all participants. Workshop outputs may, for instance, be deposited here.

Reading list

Below is a list of readings that go with the lectures delivered over the winter school, grouped according to the day of the lectures. Each university has different requirements on whether readings are mandatory or recommended.

Monday

Hadjichambis & Reis (2020). Introduction to the Conceptualisation of Environmental Citizenship for Twenty-First-Century Education. In Hadjichambis et al. (eds.), *Conceptualizing Environmental Citizenship for 21st Century Education*. Springer International Publishing. Available open access here: https://www.springer.com/gp/book/9783030202484

Hoffmann, S., Klein, J. T., & Pohl, C. (2019). Linking transdisciplinary research projects with science and practice at large: introducing insights from knowledge utilization. Environmental Science & Policy, 102, 36-42. (https://www.sciencedirect.com/science/article/abs/pii/S1462901119303648)

Beck, S., & Forsyth, T. (2020). Who gets to imagine transformative change? Participation and representation in biodiversity assessments. Environmental Conservation, 47(4), 220-223. doi:10.1017/S0376892920000272 (usable by open access under https://www.cambridge.org/core/journals/environmental-conservation/article/who-gets-to-imagine-transformative-change-participation-and-representation-in-biodiversity-assessments/EC1718F926D1AEC3483A1E43CE134295)

Tuesday

Bellard, Céline, Cleo Bertelsmeier, Paul Leadley, Wilfried Thuiller, and Franck Courchamp. 2012. "Impacts of Climate Change on the Future of Biodiversity: Biodiversity and Climate Change." *Ecology Letters* 15 (4): 365–77. https://doi.org/10.1111/j.1461-0248.2011.01736.x.

Hou, Jinjin, Yifei Liu, James D Fraser, Lei Li, Bin Zhao, Zhichun Lan, Jiefeng Jin, Guanhua Liu, Nianhua Dai, and Wenjuan Wang. 2020. "Drivers of a Habitat Shift by Critically Endangered Siberian Cranes: Evidence from Long-term Data." *Ecology and Evolution*, no. 10: 11055–68.

Thomas, Chris D. 2010. "Climate, Climate Change and Range Boundaries." *Diversity and Distributions* 16: 488–95.

Bergillos, R. J., Rodríguez-Delgado, C., Millares, A., Ortega Sánchez, M., and Losada, M. A. (2016), Impact of river regulation on a Mediterranean delta: Assessment of managed versus unmanaged scenarios, Water Resour. Res., 52, 5132– 5148, doi:10.1002/2015WR018395.

Bergillos, R. J., Ortega Sánchez, M (2017). Assessing and mitigating the landscape effects of river damming on the Guadalfeo River delta, southern Spain. Landscape and Urban Planning 165, 117-129, doi: 10.1016/j.landurbplan.2017.05.002

Wednesday

Beck, S., & Mahony, M. (2018). The IPCC and the new map of science and politics. Wiley Interdisciplinary Reviews: Climate Change, 9(6), e547. (usable by open access under https://onlinelibrary.wiley.com/doi/full/10.1002/wcc.547)

Bremer, S., Johnson, E., Fløttum, K., Kverndokk, K., Wardekker, A., & Krauß, W. (2020). Portrait of a climate city: How climate change is emerging as a risk in Bergen, Norway. Climate Risk Management, 29, 100236.

Kuhlicke, C, Seebauer, S, Hudson, P, et al. The behavioral turn in flood risk management, its assumptions and potential implications. *WIREs Water*. 2020; 7:e1418. https://doi.org/10.1002/wat2.1418

Bensaude Vincent (in review), Rethinking time in response to the Anthropocene From timescales to timescapes. Submitted to *Anthropocene Review*. PDF will be distributed separately.

Thursday

Steininger, K.W., Meyer, L.H., Schleicher, S., Riahi, K.; Williges, K., Maczek, F. (2020), Effort Sharing among EU Member States: Green Deal Emission Reduction Targets for 2030, Wegener Center Research Briefs 2-2020, Wegener Center Verlag, University of Graz, Austria, October 2020. https://doi.org/10.25364/23.2020.2

Otto, Ilona M., Jonathan F. Donges, Roger Cremades, Avit Bhowmik, Richard J. Hewitt, Wolfgang Lucht, Johan Rockström, et al. 2020. "Social Tipping Dynamics for Stabilizing Earth's Climate by 2050." Proceedings of the National Academy of Sciences 117 (5): 2354. https://doi.org/10.1073/pnas.1900577117.

Friday

Harris, Paul G. 2008. "Climate Change and Global Citizenship." Law & Policy 30 (4): 481–501. https://doi.org/10.1111/j.1467-9930.2008.00283.x.

Vihersalo, M. (2017). Climate citizenship in the European union: environmental citizenship as an analytical concept. Environmental Politics, 26(2), 343–360. https://doi.org/10.1080/09644016.2014.1000640

Jodoin, Sébastien, Sébastien Duyck, and Katherine Lofts. 2015. "Public Participation and Climate Governance: An Introduction: Public Participation and Climate Governance: An Introduction." Review of European, Comparative & International Environmental Law 24 (2): 117–22. https://doi.org/10.1111/reel.12126.

The Winter School Workshops

Through the carefully designed workshop exercises each day, you will 'map' local climate risks in different ways; through creative presentations (Monday), interpreting maps of climate projections (Tuesday), drawing risks as systems diagrams (Wednesday), imagining European risk scenarios (Thursday), or discussing principles of citizenship under climate change (Friday). Together these exercises build a composite picture of actual and projected risks and their management in each city. The planned output is that the sets of "maps" developed in each city will be assembled together into a common portfolio of the seven Arqus cities, as a draft *'Atlas' of climate risks at different points of Europe*.

Monday: Introducing climate risks in each city

Groups at each university will be expected to have read *existing reports on climate risk management for their city* in advance of the course. Your first group task is to creatively introduce your city and its climate risks as represented in reports by institutions responsible for managing these risks. This could be through flash cards or through a short (unprofessional) film, a photo montage, a recorded interview, a power-point… Groups and universities have full flexibility.

Tuesday: Interpreting climate risk maps

Groups at each university will be supplied with a portfolio of maps downscaling climate projections and translating these to maps of climate risk. You will have a targeted session interpreting these maps according to key questions about (i) how climate projections are downscaled; (ii) translated to risk maps; (iii) what natural processes are behind risks; (iv) and how to critically read maps – uncertainties for example. We will have experts available on Zoom to help groups with your interpretative work. You will select one map relevant to describe climate risks in your city, and present this in plenary.

Wednesday: Systems maps of elements connected in creating risks

Groups will be introduced to rapid systems mapping approaches and asked to draft a systems map showing how one prominent climate risk in their city is 'created' through diverse connected elements. For example, how coastal development pressure, in combination with weak regulation, and strong developers, and sea-level rise and extreme events might combine to assemble coastal flooding risk. You will then identify the "leverage points", ie. the most pressing parts of the system where an intervention would be most effective. This will require desktop research and creative thinking.

Thursday: Scenario mapping

In this workshop, you will work in international teams. Groups be introduced on how to use to a simple, well-established qualitative scenario method to map and plan for key future uncertainties related to climate risk. Using the four quadrant-scenario method - also known as "Shell scenarios" - you will identify important and uncertain future trends and then create four different scenarios that explore how the future might play out depending on these trends. This workshop will draw on the systems mapping exercise, and require desktop research and creative thinking

Friday: Inter-University workshop Engaging with climate risk – European citizenship in a turbulent future

In this workshop, you will synthesize the results from the preceding day's workshops and relate climate risk to European citizenship and their own personal agency. The workshop starts with an individual reflexive walk, where you will individually reflect on the key insights they have gained during the week and how that relates to engaged European citizenship and personal agency. After the walk, you will reconvene in your inter-university groups (the same as on Thursday) to collaboratively identify principles of engaged European citizenship that are meaningful to you. These principles will later be shared with the other groups.

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