

Ten new insights in climate science 2021 – a horizon scan

+++ Supplementary Material +++

Additional Figures:

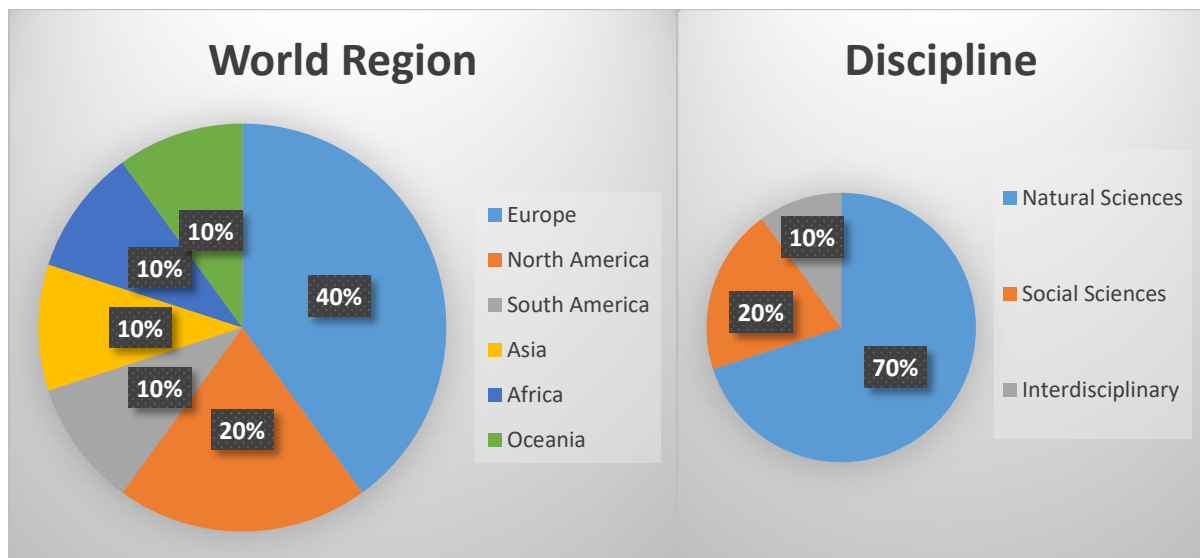


Fig x: Composition of the Editorial Board of the 10 NICS 2021 in terms of discipline and world region (affiliation based). Gender composition was 50:50 (female/male). This is a subgroup of the entire author team (expert-authors, writers and EB), as presented in the main text.

Definition of geographical regions

North America: All American countries north of Colombia including the Caribbean.

South America: All American countries south of Panama.

Africa: African countries west and south of Egypt, including Egypt.

Oceania: countries in Australasia, Melanesia, Micronesia and Polynesia

Asia: Based on [United Nations geoscheme](#) (includes Western Asia, Central Asia, Eastern Asia, Southern Asia and Southeastern Asia).

Northern, Western and Southern Europe: Based on the [United Nations geoscheme](#).

Northern Europe: Åland Islands, Guernsey, Jersey, Sark, Denmark, Estonia, Faroe Islands, Finland, Iceland, Ireland, Isle of Man, Latvia, Lithuania, Norway, Svalbard and Jan Mayern, Sweden, United Kingdom of Great Britain and Northern Ireland

Southern Europe: Albania, Andorra, Bosnia and Herzegovina, Croatia, Gibraltar, Greece, Holy See (Vatican City), Italy, Malta, Montenegro, North Macedonia, Portugal, San Marino, Serbia, Slovenia, Spain

Western Europe: Austria, Belgium, France, Germany, Liechtenstein, Luxembourg, Monaco, Netherlands, Switzerland

Eastern Europe: Belarus, Bulgaria, Czechia, Hungary, Republic of Moldova, Poland, Romania, Russian Federation, Slovakia, Ukraine

Invitation mail to expert elicitation:

Dear {{First name}},

We would like to invite you to contribute to a major synthesis of the most recent climate-related research and an important science-policy contribution: the 10 New Insights in Climate Science 2021.

Future Earth, the Earth League and the World Climate Research Programme (WCRP) have been preparing 10 New Insights in Climate Science reports for four consecutive years*, all officially received by the UNFCCC. The latest report was launched in a webinar with UNFCCC Executive Secretary Patricia Espinosa on 27th Jan 2021. This publication series curates recent advances in research and understanding related to the global climate across disciplines. With the report, we present selected highlights of the latest and best research summarized in a way that is accessible to decision-makers and laypeople, and is accompanied by a peer-reviewed paper in an academic journal.

We have begun preparing the 10 New Insights in Climate Science 2021, and are scoping expertise from around the globe for inputs on which key findings should be included in the report. Recognizing your expertise in relevant fields, we welcome you to answer a few short questions in THIS [insert link] form, before 7th March.

The two main questions we will be asking are:

1) What do you think are the 1-3 main new insights regarding climate within your field of research? Which papers or reports are these based on (published since Jan. 1, 2020)?

Decisions on the final list of 10 Insights will be taken by the Editorial Board, which comprises experts selected by Future Earth, The Earth League, and WCRP, based on the following criteria:

- The topic should have high relevance for climate policy negotiations, and the public's understanding of climate change
- There should be significant new findings on the topic since 1st Jan 2020 (older papers can be included as background)
- There is a sufficient scientific foundation for the new finding(s)

2) Would you consider being part of an author group for a selected Insight, contributing to a peer-reviewed paper on this year's 10 insights, or suggest experts as authors?

The Editorial Board will select a list of authors from the nominations based on merit, expertise and previous contributions to the '10 New Insights' reports. We invite 2-4 co-authors for each of the ten 'insights', based on the topics that are chosen. Writing begins in April and we plan to submit a manuscript no later than July, for publication by UNFCCC COP26 in November. Based on the peer-reviewed paper, a policy brief is written up which explains the findings in a condensed and simplified form to policymakers and the general public.

All invited authors are recognized as co-authors of the peer-review paper and also listed in the acknowledgements of the policy report.

We welcome questions and comments about this request or process. Please email me, Clea Edwards (Clea.Edwards@asu.edu), or (for technical issues with the form) Erik Pihl (erik.pihl@futureearth.org), and we will get back to you as soon as possible.

Thank you sincerely in advance for your involvement in this critical effort to support decision-makers and public understanding of the latest realities related to climate change.

On behalf of Future Earth, The Earth League, WCRP, and the Editorial Board,
Clea Edwards
Arizona State University/The Earth League

*WCRP joined the partnership for the report in 2020

[Call text, as published on the Future Earth website used for the poll:](#)

Researchers welcome to provide inputs on what the latest scientific advances are within climate change

In the "10 New Insights in Climate Science" reports, Future Earth, The Earth League, and WCRP aim to highlight the latest climate-related research across disciplines for the 5th consecutive year to support policy decision-makers. This synthesis is based on the contributions from expert researchers. We welcome inputs from all active researchers, across all disciplines, working with issues related to climate change.

Please share with us what you view as the 1-3 most important new discoveries or advancements in your overarching field of research since 1st Jan 2020 and the key articles and reports highlighting them. To consider a given topic, the Editorial Board requests a minimum of three (in some exceptional cases two) papers since the Jan. 1, 2020 supporting advances. You may also declare your interest in contributing as a co-author of the adjoining peer-review paper (with acknowledgements in the report to policy makers).

This poll takes approximately 10 minutes to complete.

Note: If your responses are long, we suggest writing these in a separate document and copying the text into this poll (this is to avoid any mishaps in saving on the form).

The poll closes at 24:00 GMT 7th March 2021. We collect data in accordance with our Privacy Policy.

Poll questions:

1. Please suggest one (1) Insight or key fact/advancement *

2. Please add a reference (article, report, etc) for the above insight *

3. You can add a second reference

4. You can add a third reference

5. Any further references or comments?

[1-5 repeated two times]

16. Please add your FIRST NAME and LAST NAME if you want us to be able to contact you for follow up etc - this is voluntary

17. Please add your EMAIL if you want us to be able to contact you for follow up etc - this is voluntary

18. Please add your AFFILIATION (institution) - this is voluntary

19. Would you consider being a co-author of relevant insight(s)? (Authors will be invited based on which topics that are chosen for 2021, who has proposed which topics, and on merit. Authors are supported by staff writers.)

[Sure!/Perhaps, I need to know more/No thank you]

20. Would you consider acting as a reviewer? We may suggest a few reviewers to the journal we submit to.

[Sure!/No thank you]

21. Please check if you approve of your personal data (name, email, title, affiliations, notes on field of research and prior contributions) to be saved after the completion of the 10 New Insights in Climate Science 2021. This makes it possible for us to contact you directly about inputs to future reports. The data will be saved by Future Earth with limited access for staff from The Earth League and WCRP. EU citizens have the right to have their data erased at any time following GDPR: gdpr.eu. You can do this by emailing integrity@futureearth.org

Sorting and merging of suggested topics:

The 168 suggested topics were sorted into three categories:

- a) "The input (text/reference) can be used for a new suggested insight or incorporated into an existing one." (92 topics)
- b) "This input (text/reference) seems too narrow to build an insight around as it is, or too old (less than two references after Jan 1, 2020). Could possibly be included into an insight later." (46 topics)
- c) "No potential for becoming an insight (not matching criteria described in the call)." (30 topics)

An initial list of 27 merged topics was formed from a), and the topics and references in b) were integrated in this list where possible.

List of topics distilled from the call feedback:

- I. Possible irreversible antarctic/arctic ice loss and sea-level rise
- II. Evidence of slow-down of the Atlantic meridional overturning circulation (AMOC)
- III. Marine ecosystems are strongly endangered but not beyond recovery
- IV: Value of health co-benefits can justify implementing mitigation policies
- V. Timber can decarbonize the construction sector and create an urban carbon sink (and household emissions after construction)
- VI: City-led research and innovation frameworks are gaining strategic importance in response to global climate change
- VII: Climate change has altered geographical distribution of vector-borne diseases and disease vectors
- VIII: We have to reset the global 2030 and 2050 policy agendas
- IX: Coproduction of climate change knowledge needed
- X: Women bear the brunt of climate change impacts, and are vital agents of mitigation and adaptation
- XI: Information to Action Pathways must be improved
- XII: Demand-side solutions and individual behavior change are key to addressing climate change and improving well-being
- XIII: Carbon tax is an important climate mitigation and adaptation strategy
- XIV: The sea surface microlayer (SML) is often underrepresented and undersampled - but may be important to fully understand the oceans' role in global warming
- XV: Climate crisis causes different types of conflicts
- XVI: Carbon footprints are unequally distributed, mitigation could make inequality worse
- XVII: Possible negative impacts of COVID-19 lockdown measures: reduced aerosol emissions potentially inducing global warming
- XVIII: Fires: a clear fingerprint of climate change
- XIX: Amazon forest near a tipping point
- XX: [Nature based solutions]: The importance of biodiversity and local communities
- XXI: Market-based carbon trading (offsetting) fails to reduce emissions
- XXII: GHG emissions (methane, N₂O) from lakes, streams and rivers due to fertilizers worsens the greenhouse effect
- XXIII: Vulnerability to extreme weather coupled with other hazards is amplified by population growth

XXIV: [Geoengineering]

XXV: Innovations can give lower emissions but not all are created equal

XXVI: We can learn from COVID-19

XXVII: Economic assessments of climate change impacts don't offer reliable guidance to leaders about the biggest risks