

The KlimaCampus Hamburg

In Hamburg, universities, research institutes and federal authorities have gathered to form a unique network. Their priorities: the climate, climate change and climate impacts.



Joining forces

Global climate change and its impacts raise a broad range of questions – not only scientific, but also political, social and economic.

Hamburg enjoys an international reputation for outstanding climate research. Much of what we currently know about the future of our climate is based on findings produced by Hamburg-based institutes and research facilities. At the same time, the topic offers a wealth of aspects to discuss: from the Energy Transition to agriculture, manufacturing and commerce, flood protection, and climate policy that is both effective and accepted by the public – the impacts of global change touch nearly every facet of modern life.

Disseminating research, providing a basis for decision-making

In response, universities, research institutes and federal authorities have pooled their resources in an interdisciplinary initiative, the KlimaCampus Hamburg – a network that fosters exchange, combines competences and helps to capitalize on available synergies.

The primary goals are to convey scientific findings to the general public, and to provide a sound basis for political decision-making. “In terms of responding to the impacts of climate change,

our goal is to support sound planning at the regional, national and international level,” explains Prof. Hans von Storch from the Helmholtz Centre for Materials and Coastal Research in Geesthacht. Von Storch serves on the Coordinating Group, which regularly rotates its members: “The KlimaCampus Hamburg isn’t meant to be an ‘über-institute.’ Instead, it offers a framework for collaborating on central issues, transcending the borders of individual institutes.”

The KlimaCampus is currently home to twelve Hamburg-based members. They pursue foundational research (like the Max Planck Institute for Meteorology, Universität Hamburg and the Helmholtz Centre for Materials and Coastal Research in Geesthacht), offer essential applied expertise (like the Hamburg University of Technology (TUHH) and the HafenCity University Hamburg) or represent federal authorities (including the National Meteorological Service’s Sea Weather Office, the Federal Maritime and Hydrographic Agency, and the Federal Waterways Engineering and Research Institute). Further valued partners include the Hamburg Institute of International Economics and the Institute for Peace Research and Security Policy, the Climate Service Center and the German Climate Computing Center.

... to address central issues

In many cases, institutes are already working hand in hand – a trend the KlimaCampus Hamburg will further intensify in the future.

The effects of rising sea levels vary considerably from region to region. “Our scenarios show the minimum and maximum values; in some regions the sea level may even fall,” reports Prof. Detlef Stammer from Universität Hamburg’s Center for Earth System Research and Sustainability. Findings like these offer the Federal Maritime and Hydrographic Agency valuable insights into the future water level on the Elbe and in the Port of Hamburg – and are also relevant for the Federal Waterways Engineering and Research Institute, which is responsible for maintaining Germany’s federal water routes.

Rising sea levels, storms and local flooding

Germany’s National Meteorological Service contributes its extensive archives, which include observational data and forecasts for storms, heavy rainfall, and heat waves. In turn, the Helmholtz Centre for Materials and Coastal Research in Geesthacht provides long-term analyses, which are complemented by the Max Planck Institute for Meteorology’s climate simulations. The Climate Service Center subsequently prepares these findings for dissemination to other federal authorities, companies and decision-makers. The HafenCity University Hamburg focuses on assessing the readiness of cities and metropolises with regard to the effects of climate change: “For one thing,

due to the combination of global warming, tightly packed urban architectures and large amount of sealed surfaces, in the future we’ll see more hot days and ‘tropical nights’ – and city and regional planners will need to devise new concepts to help cope with them,” stresses Prof. Jörn Knieling. The Hamburg University of Technology (TUHH) offers expert support in exploring new concepts to protect the environment and conserve resources.

Focused urban planning, economics, and climate conflicts

Over the past several years, Hamburg-based climate research has successfully built bridges to the business sciences and social sciences. For example, the Hamburg Institute of International Economics is currently researching how much climate change costs us, and which regions and sectors are hardest hit. At the same time, social scientists at Universität Hamburg are analyzing the effects of climate policy instruments, and peace researchers are working to gauge the risks of local and international “climate conflicts” over land and resources.



Studies show that the sea ice in the Arctic has been receding for the past several decades. In addition, more and more meltwater lakes – that trap and absorb heat – are forming on the ice during the summer months.

Partners in the network



1
The **Federal Waterways Engineering and Research Institute (BAW)** works to preserve and further develop Germany's waterways as a safe, economical and environmentally safe mode of transport. The BAW is the central service provider and consultancy with regard to the expansion, construction, operation and maintenance of German waterways.
www.baw.de

2
The **Federal Maritime and Hydrographic Agency (BSH)** is the central maritime service provider in Germany. Its 850 employees and five ships, based in Hamburg and Rostock, survey and gather essential data on the North Sea and Baltic, issue storm-surge warnings, monitor the ice and produce nautical charts – in short, the BSH pursues oceanographic research, advises and networks key maritime actors.
www.bsh.de

3
Universität Hamburg's **Center for Earth System Research and Sustainability (CEN)** pursues foundational research on our climate, the Earth and our environment. The fields of oceanography, meteorology, marine biology, geophysics, geology, soil science, geography, biogeochemistry, and the business and social sciences work together to address overarching issues and train the researchers of tomorrow.
www.cen.uni-hamburg.de

4
The **Climate Service Center Germany (GERICS)** at the Helmholtz Centre for Materials and Coastal Research in Geesthacht provides scientifically sound products and services designed to help politicians, administrators and businesses adapt to climate change, and to enable them to make informed decisions.
www.climate-service-center.de

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The **German Climate Computing Center (DKRZ)** provides researchers access to high-performance supercomputers and data archives, offering them the advanced resources needed to simulate complex processes in the atmosphere, on land and in our oceans with computer programs, and to calculate future scenarios. In addition, the DKRZ provides support with the optimization of climate models, and with the analysis, visualization and archiving of climate data.

www.dkrz.de

6

The **HafenCity University Hamburg (HCU)** concentrates its educational and research activities on the future-readiness of metropolises. It offers courses on and gathers the entire range of disciplines that involve comprehending and shaping urban environments.

www.hcu-hamburg.de

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The **Hamburg Institute of International Economics (HWWI)** is a vital economic think tank, where key questions concerning the future of our global society are identified and essential socio-economic relations are analyzed. Transforming theoretical findings into economic and political practice is at the heart of its work.

www.hwwi.org

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Universität Hamburg's **Institute for Peace Research and Security Policy (IFSH)** is active worldwide, and explores vital questions on crisis regulation and peace consolidation – including crises and conflicts in regions impacted by climate change. In addition to research and education, political consulting and dissemination of information are important fields of activity for the IFSH.

www.ifsh.de

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The **Institute of Coastal Research (IfK)** at the Helmholtz Centre for Materials and Coastal Research in Geesthacht researches the dynamics of and changes in coastal climates (storms, storm surges and sea state). Its climate reports on the North Sea and Baltic region, and on Hamburg's greater metropolitan area, reflect the current state of research. Given the social relevance of its work, the IfK's North German Climate Office also maintains an ongoing dialogue with key stakeholders.

www.hzg.de

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Research conducted at the **Max Planck Institute for Meteorology (MPI-M)** explores the central questions of how and why our planet's climate is changing. The models developed at the institute offer valuable tools for climate research and are used internationally as a reliable basis for assessing climate change. In addition, the MPI-M supports an international PhD program in collaboration with Universität Hamburg.

www.mpimet.mpg.de

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The **National Meteorological Service (DWD)** 'Seewetteramt' is the DWD's branch office in Hamburg and offers a "one-stop source" for weather and climate information. Its portfolio of services includes weather forecasts for North Germany and Germany's coastal waters, warnings for dangerous weather phenomena, maritime and global climate monitoring, and regional climate consulting.

www.dwd.de

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In the context of its Competence Field "Green Technologies," the **Hamburg University of Technology (TUHH)** develops climate-friendly and resource-conserving technologies and climate change adaptation strategies. To do so, it works closely together with partners from research, business and industry, attracting students from every corner of the globe.

www.tuhh.de

The network partners' activities are accompanied and supported by the City of Hamburg's **Ministry of Environment and Energy (BUE)** and **Ministry of Science, Research and Equality (BWFG)**. The BUE coordinate's the city's climate policy, and above all its efforts to adapt to climate change. In turn, the BWFG chiefly supports climate research, one of the city's most important research areas.



Home of climate research

The marine and climate sciences have deep roots in Hamburg – a city that has also been the birthplace of many pioneering advances.

As a port city, Hamburg can look back on a long tradition of weather monitoring and maritime consulting: in 1875 the German Hydrographic Office was founded on the Stintfang, just above the city's piers. The office's initial focus was on maritime meteorology, validating chronometers and other instruments, and weather forecasting. The National Meteorological Service Sea Weather Office and adjacent Federal Maritime and Hydrographic Agency would eventually take its place.

Interdisciplinarity is nothing new in Hamburg: in the 1970s researchers from the fields of meteorology and oceanography, hydrobiology and marine chemistry discarded the rigid limitations of their disciplines and began investigating the climate together. In 1975 the Max Planck Institute for Meteorology was founded

and the first coupled atmosphere-ocean models – which have since become the nucleus of many international climate forecasts – were soon produced.

Interdisciplinary collaboration, Assessment Reports, and supercomputer

Hamburg's climate researchers were the driving force behind putting "manmade climate change" – and the possibility of mitigating it – on the political agenda in Germany. In this regard, they consistently put their expertise to constructive – and comparatively dispassionate – use in the form of ongoing communications and po-

litical consulting. In the early 1990s Hamburg would receive the first-ever climate supercomputer, and soon thereafter made essential contributions to the IPCC's first Assessment Report. Universität Hamburg and the Max Planck Institute moved into new, joint offices. In 2007, Universität Hamburg, the MPI-M and the Helmholtz Centre for Materials and Coastal Research in Geesthacht successfully convinced the German Research Foundation of the need for a Cluster of Excellence for integrated climate research – establishing the city once and for all as the home of collaborative climate research that links the natural, business and social sciences. At the Klima-Campus Hamburg, this approach – transcending the boundaries of institutes and facilities – consistently shapes the work we do, today and into tomorrow.

Federal Waterways Engineering and Research Institute (BAW)
Dienststelle Hamburg, Wedeler Landstraße 157, 22559 Hamburg

Federal Maritime and Hydrographic Agency (BSH)
Bernhard-Nocht-Straße 78, 20359 Hamburg

Center for Earth System Research and Sustainability (CEN)
Universität Hamburg, Bundesstraße 53–55, 20146 Hamburg

Climate Service Center Germany (GERICS)
Chilehaus – Eingang B, Fischertwiete 1, 20095 Hamburg

German Climate Computing Center (DKRZ)
Bundesstraße 45a, 20146 Hamburg

HafenCity University Hamburg (HCU)
Überseeallee 16, 20457 Hamburg

Hamburg Institute of International Economics (HWWI)
Heimhuder Straße 71, 20148 Hamburg

Institute for Peace Research and Security Policy (IFSH)
Beim Schlump 83, 20144 Hamburg

**Institute of Coastal Research (IfK) at the Helmholtz Centre for Materials
and Coastal Research in Geesthacht**
Max-Planck-Straße 1, 21502 Geesthacht

Max Planck Institute for Meteorology (MPI-M)
Bundesstraße 53, 20146 Hamburg

National Meteorological Service (DWD) Seewetteramt
Bernhard-Nocht-Straße 76, 20359 Hamburg

Hamburg University of Technology (TUHH)
Schwarzenbergstraße 93, 21073 Hamburg

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KlimaCampus Hamburg, klimacampus@hamburg.de

Editorial staff
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