

WORKING ATMOSPHERES

21/22 NOVEMBER 2013

WEATHER AND CLIMATE SERVICES IN
CONTEMPORARY AND HISTORICAL PERSPECTIVES

CENTRE FOR THE HISTORY OF SCIENCE, TECHNOLOGY AND MEDICINE
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INTERNATIONAL COMMISSION ON THE HISTORY OF METEOROLOGY



MANCHESTER
1824

PROGRAMME

WORKING
ATMOSPHERES

THURSDAY 21 November 2:00 – 4:30

Charting Some Sites of Commercial Meteorology 1920s-1970s

Samuel Randalls, University College London

Transforming the Environment: Climate Modification and Climate Change Debates amongst Soviet Geographers, c. 1945-1960s

Jonathan Oldfield, University of Glasgow

The Storms of Doctor Strangelove: Meteorological Studies Sponsored by NATO during the Cold War

Simone Turchetti, University of Manchester

From the Airfield to the High-street: The Meteorological Office's role in the Emergence of Commercial Weather Services in the United Kingdom

Alexander Hall, University of Nottingham

THURSDAY 21 November 5:00 – 6:30

Climate Mapping for Town Planning

Michael Hebbert, University College London

The Commercialisation of Solar Risk

Simon Carter, Open University

To Salt or not to Salt - That is the Question?

John Thornes, University of Birmingham

FRIDAY 22 November 9:00 – 10:30

Data, Products and Services in the Early Years of U.S. National Climate Program

Vladimir Janković, University of Manchester

The Development of Commercial Weather Services in Europe since 1970

Richard Pettifer, PRIMET

Climate Services for Society

Suraje Dessai, University of Leeds

FRIDAY 22 November 11:00 – 12:30

Climate Services Globally, Regionally and Nationally

Chris Hewitt, UK Met Office

On the Use of Seasonal to Decadal Climate Predictions in Europe

Marta Soares, University of Leeds

Is the Market Good or Bad for Climate Adaptation Knowledge?

James Porter, University of Leeds



WORKING ATMOSPHERES

weather and climate services in contemporary and historical perspectives

Organized by Vladimir Janković and Samuel Randalls

There has been relatively little historical and critical research on applied and commercial meteorology compared to that on academic research and weather forecasting. Through the twentieth century, however, commercial meteorology and industrial climatology became increasingly prominent, often attributed to a post-WW2 glut of available meteorologists and an emerging number of corporations exploring, for example, air pollution, emergencies and business interruption issues. Governments around the world have supported the development of an explicitly commercial meteorological sector to provide competition to public services in areas of weather forecasting and consultancy, although public organizations are still generally charged with collecting meteorological data and producing emergency forecasts.

Applied and commercial meteorology are more than simply weather and climate forecasting services. Air pollution modeling, building climatology, transport, urban planning, security issues and market consultancy go beyond the application of meteorology to practical problems. Even more to the point, meteorology and climatology as scientific pursuits can be bound up in economic, health, ideological, and geopolitical concerns, sometimes acting as a tool for those empowered to promote public policy interventions, secure geostrategic position or enhance economic growth.

This two-day workshop is intended to bring to light some of these issues and stimulate discussion about the past and present climate services and institutional politics of applied atmospheric sciences, especially (but not exclusively) related to the concerns over anthropogenic climate change. The intention is to use the experience of both academics and professionals to explore, identify and reflect on the current and past developments of the applied, service and commercial climatology and consider the extent to which these knowledges have enabled organizations and governments to manage weather and climate risks.



ABSTRACTS

The Commercialisation of Solar Risk

Simon Carter, Open University

In the post WWII era sun exposure shares characteristics with other modern health risks associated with enjoyment and leisure. An activity which was previously thought to be innocuous, or even beneficial, is revealed to be risky and poses long term health dangers to the body. Like many other health risks, the danger that the sun's rays represent are temporally distant from the exposure period and the individual must rely on experts for knowledge and management of this danger. Two key developments in attempts to modify the danger of sunlight have been the introduction of the 'UV Index' and the 'sun protection factor' (SPF) found on sun-creams. The 'UV index' was a result of an international collaboration in the 1990s between the WHO, the UNEP, the WMO, and the ICNIRP to produce a simple measure of the ultraviolet radiation reaching the Earth's surface in terms of its potential for skin damage. The SPF was standardised in the late 1970s by the North American FDA being based on an earlier 'Schulze Factor' dating from the 1950s. In parallel, and closely connected, with the development of these indexes were public health and commercial responses to the increasing realisation that sun exposure was risky. For example, over the past three decades the sales of 'sun-care' products have grown steadily (around 10% a year over the last decade) and were globally worth \$7.8 billion in 2008. This emphasises that interventions to modify solar risk have developed at the borders of several domains such as health education, tourism, meteorology, and cosmetics/fashion consumption. This neatly emphasises the point that solar risk modification practices emerge out of the (re)production of various diverse heterogeneous networks.

Climate Services for Society

Suraje Dessai, University of Leeds

Climate services have been framed as the generation and provision of climate information for decision-making at all levels of society. These services are targeted at informing adaptation to climate variability and change, widely recognised as an important component of sustainable development. This paper reviews the development of climate services, beginning with a historical overview, a short summary of improvements in climate information, and a description of the recent surge of interest in climate service development including, for example, the Global Framework for Climate Services, implemented by the World Meteorological Organization in October 2012. It also reviews institutional arrangements of emerging climate services across local, national,

regional, and international scales. By synthesising existing literature, the paper proposes four design elements of a climate services evaluation framework. These design elements include: problem identification and the decision making context; the characteristics, tailoring and dissemination of the climate information; the governance and structure of the service, including the process by which it is developed; and the economic value of the service. The design elements are intended to serve as a guide to organize future work regarding the evaluation of when and whether climate services are more or less successful. The paper concludes by identifying future research questions regarding the institutional arrangements that support climate services and nascent efforts to evaluate them.

From the Airfield to the High-street: The Meteorological Office's Role in the Emergence of Commercial Weather Services in the United Kingdom

Alexander Hall, University of Nottingham

In the post-war years across most meteorologically advanced nations, national weather service's played a key role in the emergence of commercial weather services; whether through the funding of applied research, the training of meteorologists and climatologists, or through the direct provision of their own commercial services. In the UK, businesses providing commercial weather services, independent of the Meteorological Office (MO), were slower to emerge than in the US or other similar European countries. This paper charts the role the MO played in the emergence of commercial weather services in post-war Britain, from their involvement with traditional customers such as mariners and aviators to the explosion of MO services for small business owners in the 1960s. Whilst MO involvement in such services, was often ad-hoc in the immediate post-war years, this paper explores how the expansion of commercial services alongside public weather services in the coming decades, may have held back the development of private commercial weather services in the UK.

Although many other MO developments throughout the 1950s and 1960s were largely influenced by US Weather Bureau operations, this paper will explore why the UK MO began routinely providing many meteorological and climatological services to businesses, which in the US were considered to be the realm of the private sector. A legacy of such services can be traced through to today's MO; now a Government Trading Fund in the Department for Business, Innovation and Skills, which in recent years has repeatedly posted large operating profits.

Climate Mapping for Town Planning

Michael Hebbert, University College London

Ever since the emergence of urban climatology as a distinct scientific specialism in the mid twentieth century, it has carried a practical corollary: the proposition that ‘town planners’, i.e. those who design the built environment, or regulate its design, should apply the insights of urban climatology towards improved climatic outcomes. While the idea of planning as a climatological feedback loop was no more than a pious hope in most countries of the world, German cities did develop techniques for mapping climatic phenomena and deriving tangible policy recommendations. Since 2000, these ‘*Klimaatlas*’ methods have diffused more widely, with particular interest in cities of South East Asia. The paper reviews the state of the art in climate mapping for town planning and assesses prospects.

Climate Services Globally, Regionally and Nationally

Chris Hewitt, UK Met Office

There are many climate service activities underway, globally, regionally, and nationally in the UK and elsewhere. At the global scale the main activity is the Global Framework for Climate Services (GFCS) which arose from the World Climate Conference 3 in 2009, as well as newer activities such as the Climate Service Partnership and the associated annual International Conference on Climate Services. In addition to describing such global activities, this talk will present some regional activities in Europe (such as the EUPORIAS project) and activities in the UK at the Met Office.

Data, Products and Services in the Early Years of U.S. National Climate Program

Vladimir Janković, University of Manchester

Within a decade following the US Congress decision to enact the National Climate Program Act in 1978, the National Research Council published a series of reports on the state of climate research and institutional infrastructure intended for acquisition and management of climate data, products and services. The sense of urgency and the significance given to climate monitoring, processing and use, led to a series of high-level meetings aimed to address, among other issues, the adequacy of existing practices of data management and their end use. Policy makers hoped that the Program would provide ‘*useful outputs*’ and enhance the understanding of climate and its relationship to society. They agreed on the necessity for a better assessment of climatic impacts

on society, especially in relation to the variations of climate that the during the 1970s have affected provision of supplies, inventories and fixed investments such as dams or insurance policies. Crucially, advisors adopted the cost-benefit approach, arguing that the ad hoc, re-active or flexible responses to climate variability cost more than those based on informed climatic projections. The monetary impact was calculated as the difference between the return to a flexible policy in the absence of a good climate information and a more planned policy based on reliable indicators. In this presentation I revisit the arguments advanced during the early years of the Climate Program and the key emphasis given to service-oriented climate products that had substantial influence on the production, transfer, storage and delivery of climatological information.

Transforming the Environment: Climate Modification and Climate Change Debates amongst Soviet Geographers, c. 1945-1960s

Jonathan Oldfield, University of Glasgow

This paper focuses primarily on the ideas of climate modification and climate change that circulated amongst Soviet geographers and cognate scientists during the early post-Second World War period. Climatology formed an integral element of Soviet physical geographical practice, and the immediate post-war period coincided with marked developments in both the conceptual and applied aspects of this practice mediated by the ideological concerns of the state. A main focus of the paper is the conceptual work of geographers/cognate scientists associated with the Great Stalin Plan for the Transformation of Nature (1948-1953) which was premised on the notion that the natural environment - including climate – could be modified in order to address long-standing agricultural productivity concerns in the European part of Russia. Work in this area drew heavily from the ideas of pre-revolutionary scholars including the climatologist A.I. Voeikov (1842-1916) and soil scientist V.V. Dokuchaev (1846-1903). The paper then moves on to trace the development of this work during the 1950s and 1960s noting the growing importance of theorising around the earth's heat and water balance as well as speculations over the potential for human influence on global climate systems. In general, the paper aims to highlight both the range and depth of understanding related to climate modification and climate change that existed amongst Soviet geographers during the early post-war period and prior to the emergence of such debates on the world stage in the late 1960s and early 1970s.

The Development of Commercial Weather Services in Europe since 1970

Richard Pettifer, General Secretary PRIMET

This paper will explore the development of commercial weather services in Europe over the past 40 years. We will consider how this development has been affected by advances in the awareness of the commercial value of weather forecasts, the advances in forecasting accuracy, government policies relating to the organisation of weather services and the philosophical argument over the status of “Public Sector Information” (PSI). We will argue that there has been and remains a clear loss of economic value to central exchequers as the result of the present governmental policies in many countries in the commercial meteorological segment of the economy and will look at ways that this position could be improved. Finally, we will look briefly at some of the potential problems confronting the market as it tries to develop further.

Is the Market Good or Bad for Climate Adaptation Knowledge?

James Porter, University of Leeds

Adaptation is “Big Business”. Worth £2billion a year to the UK economy, the commercialisation of climate services in recent years, has become integral to developing (and exporting) bespoke forecasting/modelling tools. Work spun off from the Climate Change Act 2008, with public and private organisations called on to manage climate risks, in chorus with the hollowing out of in-house technical capacities, has attracted a wide range of specialist consultancies. Different scales of climate knowledge have emerged, as a result. Where national-scale analyses (e.g. UKCP09) from public services, like the Met Office, and is exactly where the finer spatial/temporal resolutions of specialist consultancies step in. Whether the climate data can be robustly downscaled to local scales and what happens when uncertainties are smoothed out, raises questions about the differing conditions under which public and private organisations operate – speed, cost and accountability. Designing flood protection schemes, for example, involves converting UKCP09 outputs into something usable, and traceable, at the local-scale. Defra guidelines black-box UKCP09. Flood modelling must now include a 20% climate freeboard. But is 20% really applicable everywhere? What friction is encountered as climate knowledge moves from one production site to another? And why have consultancies embraced this figure? Drawing on interviews with specialist consultancies in the UK, this talk argues that a particular kind of climate adaptation is being produced: one that prioritises administrative convenience and accountability at the expense of scientific fit.

Charting Some Sites of Commercial Meteorology 1920s-1970s

Samuel Randalls, University College London

In this overview, I present a summary of the previous literature on commercial and applied meteorology and combine this with data drawn from conference programmes and other sources to identify some of the key persons and organizations involved in the sector. Commercial meteorology was not simply the application of science to commercial problems; rather, from weather prediction to air pollution modelling to agricultural yield measurements, commercial meteorologists created or developed datasets, models and forecasting techniques. The paper will also explore the ways in which this expertise was utilized in interventions to manage weather risks for example in insurance or the management of energy supply.

On the Use of Seasonal to Decadal Climate Predictions in Europe

Marta Soares, University of Leeds

Seasonal to decadal (S2D) climate forecasts are regarded as potential tools to help inform decision-making in sectors more susceptible to weather events and climate impacts. The development of seasonal and interannual forecasts has been evolving in recent years although skill and predictability differ across regions. Decadal predictions, of a more experimental nature, are now emerging but limitations to the science persist. Although recognised as important timescales to inform decision-making little is known about the use and uptake of S2D predictions in Europe. To fill this gap we conducted a systematic literature review on the use of S2D predictions in Europe, a workshop with European climate services providers, and interviews with experts. In addition, we reviewed past experiences and the legacies of the use of these kinds of predictions elsewhere to consider lessons and lenses for framing such discussions in the emerging context of S2D predictions in Europe.

We found that although the use of S2D predictions across Europe is still fairly limited, particular sectors such as the energy, water, insurance, and transport sectors are taking the lead on the uptake of these types of predictions. Our analysis also highlighted the central role of the European Centre for Medium-Range Weather Forecasts and National Meteorological and Hydrological Services as the main producers and providers of S2D predictions in Europe. Perceived barriers to the uptake of these types of predictions are mainly associated with low skill and predictability but also with other factors such as relevance, usability, and accessibility to S2D predictions by the end-users. The analysis performed to date is a first step to improve current understanding of the use of S2D predictions across Europe. However, further research is

needed to help us better understand some of these issues including the complexity of existing chains of provision for S2D predictions in Europe, the roles of the various actors involved, and the use and added value of these types of predictions in decision-making. This paper will present these interim findings and consider some of the broader issues raised by the emergence of S2D predictions for climate services in Europe.

To Salt or not to Salt - That is the Question?

John Thornes, University of Birmingham

Following the development of the Motorway network in England (the Preston Bypass (M6) was the first section of motorway opened in 1958, with sections of the M1 following in 1959) and subsequently the very cold winter of 1962/63 - which caused chaos with ice and snow covering the carriageways - rock salt was spread experimentally for the first time to try and melt the ice and snow. Before that sand and cinders were spread by hand with little success. Road Danger Warnings were developed by the Met Office in the 1960s which were sold to highway authorities at cost (just a few hundred pounds per winter season ie not much more than £1/day). Highway winter maintenance now costs up to £400m/year in the UK and commercial road weather warnings bring in around £4m/year to the Met Office and private weather services. Road weather forecasts are key: because if salt is spread before ice or snow - you only require about one quarter of the salt that is required to melt ice or snow once it has accumulated. This talk will look at the development of this service in the UK from Road Danger Warnings in the 1960s to the Route Based Forecasts of today.

The Storms of Doctor Strangelove: Meteorological Studies Sponsored by NATO during the Cold War

Simone Turchetti, University of Manchester

From the early 1960s NATO funded several strands of weather research in Western Europe. The alliance's Science Committee set up two advisory panels (one devoted to meteorology and the other to radio-meteorology) to coordinate the development of new research projects. These panels were active for more than a decade offering to prominent European scholars the opportunity to investigate weather phenomena and organize conferences with NATO funds. Support of basic science (and meteorology) was premised on the plan to strengthen the alliance by forging synergies and collaborations between national research groups.

But an exploration of the drivers behind NATO-sponsored meteorological research also shows that the basic knowledge that weather experts sought to put together had practical, and even strategically vital,

ambitions. Early projects were conceived so as to assist NATO planners in understanding how weather affected NATO communication networks thus disrupting detection of enemy forces. Later on the meteorologists were invited to consider if new knowledge could enable NATO to use weather phenomena as unconventional weapons, especially by triggering nuclear explosions in the upper strata of the atmosphere. Only at the end of the 1960s the meteorologists funded by NATO turned to research themes less controversial and of lesser relevance to defence plans, especially by looking at air pollution and climate change. By exploring the research trajectory of NATO's meteorological research groups, I thus seek to shed new light on the reasons behind this transition from fundamental research matching stereotypical Cold War strategic needs to studies focusing on environmental issues.