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Keynote Forum

(Day 1)

Gene Fry, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Gene Fry
Energy Efficiency & Global Warming Consultant, USA

4.5 to 7.8°C global surface warming from today's CO_2 and CH_4 levels

Earth's surface will warm, due just to today's 400 ppm CO2 and 1840 ppb CH4, by 2-8 x as much as it has since 1880. Already, land surfaces have warmed 1.0 °C (5-year mean) over the last 50 years and 1.5 °C over the last 130. Sea surfaces have warmed 1.0 °C over the past 100. Meanwhile, ocean depths add more heat every 2 years than all the energy humans have ever used. Vostok ice core data analysis connects today's CO2 levels with 7.4 °C surface warming there, compared to the 1951-1980 mean. Using a 50% polar to global Δ°C conversion, using NASA observations since 1880, the Δ 3.7 °C result is highly consistent with CO2 and Δ°C data from 4 and 14 million years ago. Adding Vostok CH4 data to the analysis connects today's CH4 and CO2 levels with 6.5 °C global surface warming above baseline. Δ 3.7 °C globally (more inland and poleward) is enough to make Kansas, "breadbasket of the world", as hot as Las Vegas. The analysis suggests major lag effects to come, mostly from albedo changes. Some major albedo changes come this century, from disappearing Arctic sea ice and anthropogenic sulfates, plus receding snow cover. Albedo effects from ice loss in Greenland and Antarctica happen more slowly. When Earth last had 400 ppm CO2, sea levels were estimated at 20-35 meters above today's, indicating up to 50% ice loss eventually. The loss rate is only 1/4 that during the recent ice ages, but still 6-7 meters/°C.

Biography

Gene Fry completed his PhD in Resource Economics from Cornell University in 1989. He was Director of Policy and Planning for the Maine Energy Office, then Economist in the Electric Power Division of the Massachusetts Utility Commission for 13 years. After stints as contributing Editor for climate change issues at the Global Environmental Change Report and Business and the Environment, he managed energy efficiency program evaluations for Northeast Utilities for 3 years, until he retired in 2011. He has published 2 articles in refereed journals.

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Agustin J Colussi, J Earth Sci Clim Change 2016, 7:9(Suppl)
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'Sizing' heterogeneous chemistry in the conversion of gaseous dimethyl sulfide to atmospheric particles

The oxidation of biogenic dimethyl sulfide (DMS) emissions is a global source of cloud condensation nuclei. The amounts of the nucleating $H_2SO_4(g)$ species produced in such process, however, remain uncertain. Hydrophobic DMS is mostly oxidized in the gas-phase into $H_2SO_4(g)$+DMSO(g) (dimethyl sulfoxide), whereas water-soluble DMSO is oxidized into $H_2SO_4(g)$ in the gas-phase but into SO_4^{2-} + $MeSO_3^-$ (methane sulfonate) on water surfaces. Thus, R=$MeSO_3^-$/non-sea-salt-SO42- ratios would therefore gauge both the strength of DMS sources and the extent of DMSO heterogeneous oxidation if Rhet = $MeSO_3^-/SO_4^{2-}$ for DMSO(aq) + ·OH(g) were known. Here we report that Rhet=2.7, a value obtained from online electrospray mass spectra of DMSO (aq) + ·OH(g) reaction products, which quantifies the $MeSO_3^-$ produced in DMSO heterogeneous oxidation on aqueous aerosols for the first time. On this basis, the inverse R-dependence on particle radius in size-segregated aerosol collected over Syowa station and Southern oceans is shown to be consistent with the competition between DMSO gas-phase oxidation and its mass accommodation followed by oxidation on aqueous droplets. Geographical R variations are thus associated with variable contributions of the heterogeneous pathway to DMSO atmospheric oxidation, which increase with the specific surface area of local aerosols.

Biography

Agustín J Colussi is a Senior Research Scientist at CALTECH since 1998 and has published more than 200 papers in environmental physical chemistry.

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Jaime Senabre, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Wild l and fires and climate change

Forest fires are a natural process in many ecosystems. Each has a regime characteristic fire, that is, a level of frequency, size, intensity and certain seasonality and is considered natural and necessary for maintaining the sustainability and biodiversity species. The problem of forest fires arises when the balance between what is considered "natural" and sustainable breaks. Today, it seems that there is no doubt that we are immersed in a period of climate change characterized by global warming, which suggests that the current regime of forest fires is also likely to change due to, among other things, the close relationship established between climate and forest fires. The rainfall is also changing, a decrease is observed in water availability and increasing drought periods, so this change will not compensate for the temperature increase and enhance the flammability of forest areas. Have identified a number of factors related to global change and are linked with the change of regime forest fires, such as changes in the density and distribution of human population (involved in increasing the number of ignitions), the rural abandonment, deforestation and fragmentation of the landscape, changes in the management of the mountain, the increase of invasive species and increased carbon dioxide in plants and ecosystems (involved in increasing the quantity and continuity, i. e, availability, made out of fuel). Thus, changes in climate, alone, are not sufficient to bring about extreme changes in fire regime in the short or medium term, but the increase is needed and continuity of fuel (biomass) in a given space. Trying to predict long-term changes in fire regimes is very difficult and imprecise, since it will depend on the interactions between influencing factors and their relationship over time, true modeler's fires and shapers of the landscape.

Biography

Jaime Senabre (1966). Graduated in Psychology, is currently developing his PhD thesis in the Department of Personality, Evaluation and Psychological Treatment of the UNED. He has extensive postgraduate training, achieving a total of five Masters, including: Masters in Occupational Health, Safety and Workplace Risk by Camilo José Cela University, Madrid; Master of Psychopathology and Health, UNED; Master of Civil Protection and Emergency Management, University of Valencia. He is also a Diploma in Psychological Intervention in Emergencies and Disasters, Environmental Consultant, Expert in Human Resources and Criminology. His multidisciplinary background has led him to exercise his professional work as a wildland firefighter for 18 years and is currently Chief of the Wildland Fire Brigade. Exerts Clinical Psychology at several private centers and provides training to the various emergency services and police. Director and Chairman of the Scientific-Professional Committee of the National Symposium on Forest Fires -SINIF (2008-2014) and creator of SINIF Awards, for Innovation and Technological Research, Prevention and Management Development on Forest Fires.Member of: Spanish Society for the Study of Anxiety and Stress, Spanish Association for Clinical Psychology and Psychopathology, and Spanish Association of Behavioral Psychology.

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Bruce Barrett, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Bruce Barrett
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Mindfulness-based health-enhancement and carbon footprint reduction

Background: Greenhouse gas emissions from human activities are causing climate change. Behaviors including transportation, diet, and energy use influence societal processes that release greenhouse gas pollutants, but are also related to health and well-being. Replacing automobile driving with walking and cycling, for instance, may increase health and well-being while lowering environmental impact. Mindfulness-based practices can be effective in modifying health-related behaviors.

Specific Aims: (1) To pilot test a mindfulness-based behavioral program aimed at: (a) enhancement of health and well-being, and (b) reduction in carbon footprint; (2) carry out a randomized controlled trial to assess impact on health, well-being, and carbon footprint.

Approach: Our multi-disciplinary team has designed an 8-week mindfulness-based behavioral training program. The Mindful Climate Action (MCA) program aims to: (1) teach climate change core knowledge, (2) decrease household energy use, (3) reduce automobile and air transport, (4) increase active transport and physical activity, (5) modify dietary impact on carbon footprint, (6) reduce unnecessary purchasing and consumption, and (7) improve personal health and well-being.

Significance: Despite known behavioral contributions towards climate change, little work has been done to understand and modify the individual-level choices and behaviors involved. Mindfulness-based trainings are rapidly proving successful for behavioral modification and health-enhancement. Behavioral training leading to increased active transport (more exercise), healthier plant-based diets, and reduced energy consumption and unnecessary purchasing could yield significant benefits in terms of both sustainability and personal health and well-being.

Biography

Bruce Barrett is a board-certified, a practicing Family Physician and tenured research Professor at the University of Wisconsin-Madison. He has published more than 80 peer-reviewed scientific papers, and has directed four randomized controlled trials funded by the US National Institutes of Health, with more than 1,500 subjects. Two of his trials assess the impact of training in mindfulness-based stress reduction on the immune system and acute respiratory infection. He has led the Mindful Climate Action group since its inception in 2014.

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Ahn Ji Whan, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Coal combustion byproducts recycling and utilization for sustainable solutions to climate change

An increasing global demand for new products and emerging technologies that use rare earth elements (REEs) while global consumption of rare earth elements (REEs) has registered a steady and significant increase, their supply has drastically diminished. Rare earth elements (REEs) are found in most everyday applications because of their unique chemical and physical properties. The distribution and supply of the rare earths are highly demand, so convergence technologies are necessary for the recovery of critical rare earth elements from coal power plants waste or coal combustion by products and simultaneous CO_2 utilization. Recycling and Utilization of coal byproducts are the sustainable solutions to climate change. Carbonation is one of the cost effective and eco-friendly processes for the recovery of rare earth metals by using limestone and limestone mixture from power plants waste or sludge. This accelerated carbonation is more suitable process for CO_2 capture and utilized this CO_2 for manufacturing different kinds of new calcium carbonates used industrial residues (e.g., power plants ash). This paper mainly concerns the case studies of sustainable critical rare earth elements in various fields and managing the supply chain risks of rare earth elements (REEs).

Biography

Ahn Ji Whan received a BS, MS and PhD degree in Mining and Minerals Engineering during the years 1986-1997 from Inha University and has another Master's degree in Resources Environmental Economics from Yonsei University. Currently, she is working as a Principal Researcher in Korea Institute of Geosciences and Mineral Resources, Director for Resources, Environment and Materials R&D Center, KIGAM, President for Korea Institute of Limestone & Advanced Materials (KILAM), Chairperson, Japan/Korea International Symposium on Resources Recycling and Materials Science, Vice President of Korean Society for Geosystem Engineering and Vice President of Korea Institute of Resources and Recycling. She is an Advisory Member for Ministry of Environment-consulting committee of waste treatment technology (ME-CCWTT) and is Representative for ISO 102 (Iron Ore) from South Korea. In KIGAM, she has 20 years research experience and started the multidisciplinary research areas and developed new novel technologies. She has published more than 154 papers, 716 proceedings papers/Conference presentations and 71 patents. She received many awards, National Science Merit (Presidential Citation Award), The Excellent Research award from Ministry of Knowledge Economy and The First Women Ceramist award etc., for her research excellence.

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Frederick House, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Frederick House

Drexel University, USA

On the issue of increasing carbon dioxide concentrations and global climate change

Greenhouse gases, in particular carbon dioxide, are responsible for warming the earth's climate making the planet habitable for mankind. The physics of this warming is unquestioned. The big problem, of course, is there is no proper evidence of what causes warming. One would be astonished if mankind, with its prodigious release of greenhouse gases were not having an impact on climate. But how and how much are critical questions. This paper examines the question of how much, relative to increase in carbon dioxide. In general, climate scientists look at global warming as a time series of changing temperature along with a time series of carbon dioxide increase. The issue herein is using one series to explain the other, both of which are singular functions in time. This process seems to be a fault in their analysis procedures. This paper applies the technique of cross-correlation, which is a standard method of estimating the degree to which two series are correlated. Global and hemispheric anomalies of temperature are taken from the HadCRUT4 (United Kingdom) data set and global carbon dioxide concentrations from the EPA (United States). The results indicate a relatively weak correlation of 0.691 globally, 0.689 and 0.662 for northern and southern hemispheres, respectively. A revealing correlation between temperature anomalies and sea level changes was a robust 0.89 as might be expected. Has the scientific community been overplaying the importance of carbon dioxide and not looking carefully at the evidence in front of them?

Biography

Frederick House received his BS degree in Meteorology from Penn State (1957) and served NATO forces in Europe as an Air Force Weather Officer. Upon discharge from service, he attended graduate school at the University of Wisconsin-Madison, receiving the MS degree in 1962 and PhD in Meteorology in 1965. Then he worked for the GCA Corporation in MA performing contract research for government and industry. In 1970, he came to Drexel University and taught physics and atmospheric science until retirement in August 2013. His research specialty is Satellite Meteorology with emphasis on earth radiation budget measurements and limb, scanning the stratosphere in the infrared spectrum.

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Nils-Axel Morner, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Nils-Axel Morner

Stockholm University, Sweden

Causes and effects of climate change

Climate is constantly changing and there is nothing new or unusual in the recorded changes over the last decades and centuries. The long-term ice age cycles are forced by the changes in the earth–sun relation. The yearly cycle is a function of the tilt of the spin-axis. The daily cycle is a function of Earth's rotation. The decadal, centennial and millennial changes in climate have a more uncertain origin. The more we learn, the more obvious it becomes that they are forced (at least predominantly) by solar variability and its changes in emission of luminosity and solar wind. Having established this, we can be reasonably sure that we are facing a new Grand Solar Minimum to culminate at around 2030-2040. This implies that the period of global warming is more or less over. We think this represents "reality" because it is backed up by available observational facts. The hypothesis of an anthropogenic global warming (AGW) driven by the post-industrial and especial post-world-war 2 increase in atmospheric CO2 content tells a quite different story. This idea is founded on models; not observations, hence it represents "virtual reality". There are 102 AGW-models of present-to-future changes in temperature. They all rise up to a level in year 2100 of +2.7 ±0.7 °C. Global observational records from Earth's surface stations as well as satellite and balloon records from the troposphere give no such trend, however; with little or no rise since 2003. In true science, observations overrule models. Sea level change is another central issue. On a global scale, sea level has changed over the last 300 years in the order of ±1.0 mm/yr (10 cm in 100 yrs). Today, the variability ranges between ±0.0 and +1.0 mm/yr. Other claims are not anchored in proper observational facts.

Biography

Nils-Axel Morner obtained his PhD in Quaternary Geology at Stockholm University in 1969. He was Head of a personal institute at Stockholm University and the Swedish National Council on Paleogeophysics & Geodynamics (P&G) from 1991 up to his retirement in 2005. He has written many hundreds of research papers and several books. He is a global traveler and has undertaking field studies in 59 different countries. Several students have taken their Doctoral degree at the P&G institute, which became an international centre for global sea level change, paleoclimate, paleoseismics, neotectonics, paleomagnetism, Earth rotation, planetary-solar terrestrial interaction, etc. He was President of the INQUA Neotectonics Commission (1981-1989) and President of the INQUA Commission on sea level changes and Coastal Dynamics (1999-2003). In 2008, he was awarded the Golden Condrite of Merit (from Algarve University) for his irreverence and contribution to our understanding of sea level change.

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Douglas Ray, J Earth Sci Clim Change 2016, 7:9(Suppl)
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World Conference on

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Douglas Ray

Pacific Northwest National Laboratory, USA

Pathways to net-zero carbon emissions

Limiting global warming requires that net emissions of greenhouse gases ultimately be reduced to zero. It is becoming increasing probable that "negative CO_2 emissions" will be required to limit global warming to 2^0C. I will discuss this thesis, various approaches to negative CO_2 emissions, the scientific challenges associated with these approaches and offer a prognosis.

Biography

Douglas Ray is Director of Strategic Partnerships at the US Department of Energy's Pacific Northwest National Laboratory. He is a Fellow of the American Association for the Advancement of Science and serves on the Editorial Advisory Board for the ACS journal Energy & Fuels, the Carbon Capture Simulation and the Joint BioEnergy Institute Boards of Directors, the Advisory Committee for the Dalian (China) National Laboratory for Clean Energy, the International Energy Agency's Experts Group on Science for Energy, and the Scientific Advisory Committee of the DOE's Combustion Research Facility. He holds a PhD in Chemistry from the University of California-Berkeley.

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Olga V Kalashnikova, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Olga V Kalashnikova
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Current and future satellite observations of aerosol types affecting human health

Airborne particulate matter (PM) is currently recognized as a top environmental risk factor worldwide, responsible for ~3 million premature deaths per year. While PM is a well-known cause of heart disease, cardiovascular and respiratory illness, low birth weight, and lung cancer, the relative toxicity of specific PM types-components having different sizes and chemical compositions is currently poorly understood. Based on solid evidence that health effects depend jointly on PM size and composition, the World Health Organization has stressed the importance of filling this gap in our understanding of the associations between specific sources of PM types (both natural and anthropogenic), particle atmospheric transport, and health impacts on a global scale. That knowledge would help to prioritize PM source-specific intervention and emission control policies to maximize protection of human health. We will summarize PM information available from current generation of aerosol-specific satellite instruments: MODIS (multispectral), MISR (multispectral, multi-angle), and POLDER (multispectral, multi-angle, polarimetric), and review applications of these measurements for epidemiological studies. In addition, we will discuss a pathway toward identifying the most toxic components of PM that occurred recently with the selection of the Multi-Angle Imager for Aerosols (MAIA) investigation as part of the NASA Earth Venture Instruments (EVI) program. MAIA is a targeting instrument that will acquire observations over roughly a dozen globally distributed metropolitan areas with science focused specifically on the PM types/health connection. This means that the MAIA targeted approach is a pathfinder toward a more powerful, global, space-based aerosol and PM measurement system.

Biography

Olga V Kalashnikova is an aerosol scientist of Multi-angle Imaging SpectroRadiometer (MISR) team at the Jet Propulsion Laboratory (JPL) and a science team member of MISR, PACE and MAIA satellite teams. She graduated from the University of Colorado, Boulder with a PhD degree from the Department of Astrophysical, Planetary and Atmospheric Science (APAS) in 2002 and joined JPL in the fall of 2002 as a National Research Council Post-doc. She has been serving as a vice-chair of COSPAR commission A since October 2012 and as a member of Atmospheric Observational Climate Panel since March 2016.

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Norman P A Hüner, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Norman P A Hüner

University of Western Ontario, Canada

Photosynthetic acclimation and enhanced crop productivity in response to climate change: The grand design of photosynthesis

Daniel Arnon first proposed the notion of a 'grand design of photosynthesis' in 1982 to illustrate the central role of photosynthesis as the primary energy transformer for all life on Earth. However, I suggest that this concept is also consistent with the broad impact of the chloroplast not only in global energy transformation but also in the regulation of plant growth, development and ultimately crop seed yield. I reviewed recent data that support the important roles of chloroplast redox imbalance in governing plant acclimation to abiotic stress through localized, intracellular retrograde signal transduction pathways as well as long distance, intercellular signal transduction pathways within a single plant. We suggest that the family of nuclear C-repeat binding transcription factors (CBFs) may be critical components that link enhanced photosynthetic performance and chloroplast redox regulation with the accumulation of growth-active gibberellins, the dwarf phenotype, and increased seed yield under controlled environmental conditions in overwintering cultivars in an array of plant species. We show that the controlled environment data for enhanced wheat seed yields confirm 60 years of seed yield data from the field. These data are discussed in terms of the molecular mechanism underlying the development of semi-dwarf cereals which were the basis of the green revolution of the 1960s. Based on differential seed yield data worldwide, we propose that, in the short term, the gaps in wheat seed yield between Europe, China and North America since 1964 could be reduced by increasing the area seeded with winter versus spring wheat varieties. In the long-term, exploitation of CBF overexpression by either classical plant breeding or through biotechnology may contribute to either the maintenance or perhaps even the enhancement of crop productivity under future climate change scenarios.

Biography

Norman P A Hüner is a Tier 1 Canada Research Chair in Environmental Stress Biology and the Founder and Principal Scientist of the Biotron Centre for Experimental Climate Change Research, University of Western Ontario focused on the elucidation of the mechanisms by which plants, microbes and insects sense and adjust to climate change. He elected as a Fellow of The Royal Society of Canada in 1995 and was the past Director of the Life Sciences Division, Academy III, the Royal Society of Canada as well as past President of the Canadian Society of Plant Biologists. Since 1980, his research group has pioneered the concept of excitation pressure as a redox sensing mechanism in plants, algae and cyanobacteria.

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Paula Fernandez Gonzalez, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Paula Fernandez Gonzalez
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Monitoring trends in EU CO_2 emissions: A carbonization index through divisia index

Concerns on rising concentrationsof CO_2 in the atmosphere and global warming have increased in recent years. Numerous environmental studies analyze the trends in CO_2 emissions and their main drivers. In this paper we focus on the dynamics of the carbonization effect as a driving force for CO_2 emissions in the European Union (EU). By implementing the Sato-Vartia logarithmic mean Divisia index method, the trend of European emissions in the 2000-2010 period is factorized by both sector and country. The analysis stresses the relevance of the carbonization and intensity effects in order to reduce emissions. Then, based on so-called attribution analysis we present a new theoretical framework that enables the attribution of both economic sector and individual EU Member State to percentage changes in the carbonization index. Results show strong concentration of this reducing influence in some big economies. In fact, Germany, the United Kingdom, France and Italy have contributed by more than 50%. Industry emerges as the most influential sector, contributing to offset any improvement in the carbonization index. Our findings suggest strategies aiming at encouraging innovation, technical change, research on higher quality energies, fuel substitution, and installation of abatement technologies, particularly in the industrial sector of large economies.

Biography

Paula Fernández González is an Associate Professor of statistics and econometrics at the department of applied economics, University of Oviedo. She has worked for fourteen years in the fields of Energy and Environmental sciences, focusing on statistical methods, economic modelling and econometrics, and paying particular attention to index-based decomposition methods. She has published a book and more than 10 papers in international reputed journals. She is also a regular reviewer in journals such as *Energy, Energy Policy, Energy Economics, Energy Efficiency*, etc. She is Editor of the *Journal of Economics Studies and Research*, and participates in several research projects.

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World Conference on

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Neil J Holbrook

University of Tasmania, Australia

Marine heat waves: Definitions, drivers and global trends

Adverse impacts of marine heat waves (MHWs) include shifts in marine species ranges, local extinctions and economic impacts on seafood industries. Global patterns of MHWs suggest that their magnitude, timing and distribution may be driven by known modes of climate variability. Importantly, drivers represent a combination of both local and remote processes with the remote, larger-scale processes offering the potential for MHW predictability. Here we have (1) undertaken a systematic and comprehensive search of observed MHW events reported in the peer-reviewed literature, (2) synthesized and critically assessed reported details of the characteristic drivers and oceanographic processes that caused them, classified by ocean climate region and time scale under a common framework, and (3) performed a meta-analysis of these events based on high-resolution global sea surface temperature records providing unified estimates of MHW event intensity, duration and spatial extent. We have also used historical records of satellite observations, in-situ measurements, and monthly in-situ SSTs to reveal significant global trends in marine heat waves over the past century. Both the frequency and duration of MHWs have doubled since 1900, resulting in a four-fold increase in the global number of annual MHW days. These increases were generally consistent with average sea surface warming. Continued increases in MHWs, as anticipated with accelerated warming of the Earth during the 21st century, will have serious implications for marine ecosystems, biodiversity and major industries fisheries, aquaculture and tourism.

Biography

Neil J Holbrook is Associate Professor of Climatology and Climate Change and Deputy Head, Centre for Oceans and Cryosphere within the Institute for Marine and Antarctic Studies at the University of Tasmania. His interests and expertise are in the ocean's role in climate, ocean and climate dynamics, climate variability, extremes, climate change, and systems science. He led Australia's National Climate Change Adaptation Research Network for Marine Biodiversity and Resources from 2009-2013. He is President of the International Commission on Climate of IAMAS/IUGG and Fellow of the Australian Meteorological and Oceanographic Society.

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Sangseom Jeong, J Earth Sci Clim Change 2016, 7:9(Suppl)
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Sangseom Jeong
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Adaptation technology of infrastructure under climate change

Climate change causes increase in global temperature, different patterns of precipitation, and sea-level rise, which negatively affect performance of infrastructure. Infrastructure needs to be adapted to the climate change through new design, construction, or rehabilitation methods. For effective planning of infrastructure adaptation, before-and-after-adaptation analysis is important to understand the impact of climate change on infrastructure. In the past ten years, the frequency of natural disaster impacting urban area due to adverse effect of climate change has increased drastically due to flood and slope failure causing live and damaged infrastructure. Adaptation to climate change is a complex process which can be characterized as decision making under uncertainties. Climate hazard for the infrastructure can constitute socio-economic problems. They can result in damage and destruction to residential and commercial properties and public infrastructures, endangering public safety. The cost associated with the resilience of infrastructure can be quite expensive. The Green Infrastructure Technology for Climate Change (GIT4CC) center aims to develop civil infrastructure adaptation technologies for climate changes based on mid- and long-term predictions of climate changes. To develop the adaptation technologies in planning, design, and maintenance of civil infrastructure, the GIT4CC center is composed of three major subjects; 1) Climate and hydrological scenario creation for understanding the climate change impact on civil infrastructure, 2) Development of civil infrastructure adaptation technologies based on climate scenarios and impact analyses, 3) Optimization of proactive adaptation strategies using probabilistic evaluation. It is expected to guide decision making in prioritizing the most cost-effective adaptation strategies for infrastructure.

Biography

Sangseom Jeong is a Professor of Yonsei University, a vice-president of Korean Society of Civil Engineers (KSCE), a corresponding member of TC212 (Deep foundations) in ISSMGE (International Society of Soil Mechanics and Geotechnical Engineering), a chair of Asian TC-18 (Mega Foundations) and a President of GIT4CC center. He has authored and served as a reviewer for many geotechnical journals. He has co-edited 15 national geotechnical engineering text books and authored about 66 SCI articles in major reputable international journals, 128 national journals, 73 international conference papers, 80 technical consulting reports and 30 patents in deep and shallow foundations, excavation and slope stability.

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