



Health, Environment, and Education:  
Bringing Science into Practice

# Conference Abstracts



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about Health and the Environment

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## University of Cologne



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### Key Note

# Lending Context to Data: The Power of Narratives in Health Research and Practice

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### ABSTRACT

In the US and throughout some parts of the world, HIV infection has become a chronic condition due to the effectiveness of treatment in increasing long-term survival. There are an unprecedented number of older adults living with HIV. According to US surveillance data, 42% of all persons living with HIV were ages 50 and older in 2014. This number will continue to grow as life expectancy after HIV diagnoses continues to increase. Epidemiological data suggest that older adults living with HIV experience multiple comorbidities that threaten well-being. These include elevated rates of depression, isolation, and stigmatization in addition to diminishing social support. They also experience the acceleration of age-associated physical and cognitive comorbidities such as cardiovascular disease, osteoporosis, cancer, and cognitive impairment. The convergence of these psychosocial, physical, and cognitive comorbidities suggest that older adults living with HIV should be at higher risk for decreased quality of life. However, narrative research that provide a deep-dive into older adults' experiences and perspectives have revealed multiple resilience pathways towards the preservation of well-being and quality of life despite multiple threats to health. This concept is supported by the socioemotional selectivity theory that posits that as individuals age, they shift their focus to assign more weight to positive experiences and emotions as opposed to negative experiences and emotions. A related concept called the future time perspective suggests that our perceived time horizon, or the amount of time perceived to be left in life, shortens as we age which prompts the psychological shift to place more weight in positive experiences. Indeed, research suggest that happiness plotted across a lifespan would follow a U-shape where perceived levels of happiness are high earlier in life, dip in middle-age, and increase to high levels again in later life. These mechanisms may help preserve well-being quality of life among older adults with HIV as they age. Using research in HIV and aging as an example, this talk will focus on demonstrating the role of narrative research in illuminating these concepts to lend context to data which, when examined alone, may not fully capture the complexities of individual lives.

*Keywords:* HIV; aging; qualitative narratives

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Oral Presentation

# Teaching Small Area Estimation and Choropleth Mapping in Graduate Programs

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## ABSTRACT

Public health data are commonly collected with nationally representative samples, but public health policy is often implemented at the local level.<sup>1</sup> Whereas national data can inform local planning and policy development, there is a great need for public health information at smaller geographic levels. Because national health surveys rarely garner sample sizes in small geographic areas large enough to make direct estimates, interest in small area estimation (SAE) methodologies<sup>2</sup> has increased. Unfortunately, employees at local health departments often lack trained expertise in complex data analytic approaches, generally, and SAE, in particular.<sup>3</sup> In this presentation, I use SAE methodology to show how data from a nationally representative health survey in the United States – the Behavioral Risk Factor Surveillance System (BRFSS)<sup>4</sup> – can be used to estimate skin cancer prevalence rates at the local level. Additionally, I show how geographic information systems (GIS) software can be used to map the estimated skin cancer prevalence rates. Graduate degree programs should offer training in SAE and GIS software in order to equip the public health workforce with the skills needed to inform policy development with greater precision. Although a US dataset (BRFSS) was used in this presentation to examine an environmental health issue at the county level, other national health surveys could be used from other countries. For example, the European Health Interview Survey (EHIS),<sup>5</sup> was conducted between 2013 and 2015 in all European Union Member States, provides information from sampled participants on health status, health care use, and health determinants. SAE techniques applied to the EHIS could produce reliable estimates of sub-country environmental health issues.

<sup>1</sup> Brownson RC, Baker EA, Leet TL, Gillespie KN, True WR. Evidence-based public health (2nd ed.). New York (NY): Oxford University Press; 2010.

<sup>2</sup> Ghosh M, Rao JNK. Small area estimation: An appraisal. Stat Sci. 1994; 9(1): 55-93.

<sup>3</sup> Luck J, Chang C, Brown R, Lumpkin J. Using local health information to promote public health. Health Affairs. 2006; 25(4): 979-991.

<sup>4</sup> Centers for Disease Control and Prevention. Behavioral risk factor surveillance system. <https://www.cdc.gov/brfss/index.html> (accessed September 9, 2018).

<sup>5</sup> European Commission. European health interview survey. <https://ec.europa.eu/eurostat/web/microdata/european-health-interview-survey> (accessed September 9, 2018).

*Keywords:* small area estimation; mapping; predictive analytics

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Oral Presentation

# Experiential Learning through the Lens of Health Literacy and Social Media in a Higher Education Setting

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## ABSTRACT

As a result of technological advancements, many people across the globe access and assess health-related information via technological devices. However, not all health-related information available via the Internet is accurate. Moreover, there are low levels of health literacy around the globe. Health literacy as the ability to access, comprehend, evaluate and communicate information as a way to promote, maintain and improve health in a variety of settings across the life-course. In the context of health education, health promotion, and health prevention, it is important for people to get the information, education, and care they need in a way they can understand, make informed decisions, and use.

Education is one of the key settings identified in milestone reports as a common denominator to address low health literacy around the globe. Higher education can play a critical role in nurturing a health literate population. An existing overloaded curriculum, lack of time, and a lack of guidance and research base to inform content, structure and effective teaching approaches are common factors and rationale common for not providing health literacy training to health profession students in higher education. The health literacy training that does take place in health professions education tends to take place more often in health disciplines such as nursing, medical, and pharmacy education. The potential for teacher training programs to lead improvements in health literacy has been under-emphasized in research. In this study, we adopt Flanagan's Critical Incident Technique to explore the kinds of incidents (ie, learning and/or teaching-related examples) that allow Physical and Health Education Teacher Education (PHETE) candidates to promote health literacy through social media and technology during a course-based experiential learning opportunity in higher education.

*Keywords:* health literacy; social media; teacher education

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## Session 2: Environment

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### Key Note

# The Ethical Significance of IPCC's Serious Understatement of the Impacts of Human-Induced Climate Change

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### ABSTRACT

This presentation will first review recent scientific evidence that climate change is a much greater threat to life on Earth and ecological systems than recently understood by policymakers around the world because the Intergovernmental Panel on Climate Change (IPCC) has been systematically underestimating the risk. Next the presentation will describe the reasons for IPCC's understatement of the risks which will conclude that this underestimation is attributable to the consensus process followed by IPCC which requires governments to approve final reports, that some governments have pressured IPCC to draw scientifically conservative conclusions about climate change risks, and climate scientists follow epistemic norms that prevent speculation about harms that cannot be quantitatively described and verified by observations. The paper will argue that in the face of uncertainty about potentially catastrophic harms, ethics would require that all scientifically plausible impacts should be identified, and the burden of proof should be shifted to those who seek to undermine government protective government responses to demonstrate that the behaviors creating the risk are safe. The presentation will conclude with a description of the deep ethical problems with a narrow instrumental scientific and economic reasoning that has structured public debate about climate change.

*Keywords:*

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Oral Presentation

# Waldsterben reloaded – trees and forests in a rapidly changing world

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## ABSTRACT

Waldsterben, i.e. forest decline from environmental change, is not a new phenomenon. In the 1980s, human-induced atmospheric emissions of sulphur dioxide entailed acidification of rain and caused large-scale damages in European forests. Stringent measures against air pollution succeeded in reducing the causes of forest decline and allowed trees to regain vitality. In 2003, the German Federal Minister of Food, Agriculture and Consumer Protection, Renate Künast, officially announced the end of the Waldsterben.

Since 2009, however, evidence is increasing that forest decline is on the rise again, and this time not only in European forests, but across the entire globe. The new Waldsterben is also caused by atmospheric pollution but only indirectly. Human-induced emissions of CO<sub>2</sub> are altering the global climate and increasing occurrences of drought and heat spells cause physiological stress in trees. In North America, climate change in combination with accelerated development of forest pests like bark beetles has caused large-scale forest die-off. The situation in other forested biomes, including tropical forests like the Amazon and recently also European forests, is not much better as tree mortality there also increases. In contrast to the situation in the 1980s, the reloaded Waldsterben cannot be easily slowed or confined as climate change is a global issue that requires international consensus, with slow and inconsistent success.

In this presentation I will briefly underscore the beauty of trees and the importance of forests for life on Earth. I will then provide evidence for the new global Waldsterben and discuss some of the underlying mechanisms of climate change-induced tree mortality. I will present bark beetle infestations as one major driver of forest decline in temperate forests and highlight how climate and biotic factors interact to cause tree death and forest die-off. Finally, I will underscore our knowledge gaps in this particular field and emphasize how badly progress is needed to develop tools that allow realistic predictions of future forest condition under ongoing climate change.

This presentation addresses an urgent and timely environmental issue. Human societies have co-evolved with forests and threats to forest survival ultimately threaten human welfare. Invoking emotional attachment, discomfort and cognitive dissonance the presentation aims to stimulate both environmental awareness and intellectual curiosity.

*Keywords:* Forest decline, climate change, tree mortality, bark beetles

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Oral Presentation

# Engaging Learners through a Curriculum of Place: Integrating Indigenous Knowledge Systems and STEM Field Studies

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## ABSTRACT

The purpose of our research is to investigate how teacher candidates' experiences in field studies with community partners can inform an interdisciplinary STEM practicum semester based on a curriculum of place (Chambers, 2008). Many contributions to education have been made through non-Indigenous perspectives of place (Greunewald, 2003; Sobel, 2004). Emerging research suggests that place-based education is limited because it does not critique colonial legacies in theoretical frameworks of place (Calderon, 2014). Indeed, many Indigenous scholars are replacing the term 'place' with 'land' and argue that land-based pedagogies promote the decolonization of education (Ballantyne, 2014; Wildcat et al., 2014) by recognizing the intimate relationship that Indigenous peoples have with the land. One challenge with land-based pedagogies is the role non-Indigenous peoples have in this approach to the decolonization of education. Our interdisciplinary SOTL research, in a western Canadian context, explored this tension as we come to a deeper and shared understanding of our co-responsibility within Treaty 7 relationships. Learning from place emphasizes a relationship with the land (Blood & Chambers, 2006; Penetito, 2009), something deeply respected in Indigenous communities and something absent from much of place-based education. Our project seeks to close this gap by considering varying perspectives of place as it informs STEM educational pedagogy.

*Keywords:*

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### Key Note

# Effects of the German Federal Environmental Competition (BUW) on students' socio-scientific decision-making

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### ABSTRACT

Science competitions are promising and enriching measures to foster students' interest and involvement in science. They can hence be seen as a valuable element of informal education. Especially in the context of environmental controversies, extracurricular activities such as science competitions can motivate students to face sustainability-related socio-scientific issues. Because socio-scientific issues always touch upon social as well as scientific matters, individual decision-making is required for their resolution. This ability - to make informed decisions concerning ethically and factually complex problems - is recognized as a core concern of science education in various countries.

The German Federal Environmental Competition (BUW) is a science competition with an environmental and biological focus. In order to participate in the BUW the following requirements have to be fulfilled: while addressing sustainability-related questions, students need to develop an independently chosen project to investigate the underlying socio-scientific processes and to generate practical solutions. Furthermore, participants are asked to implement the project's solutions into society. The BUW therefore constitutes (1) an informal learning opportunity that requires self-regulated learning and processing from its participants and equally offers (2) an opportunity to bridge science into real-world practice.

Based on the BUW's socio-scientific orientation and its aspect of self-regulated working, one may argue that this competition constitutes a suitable environment for the development of participants' decision-making. In this presentation the overarching question therefore considers various methods that can be used in order to capture the potential development. On a more specific level, results of our study will be presented where an instrument that contextualizes decision-making in challenging issues of sustainable development was implemented. Afterwards, I will give some insight into the data that was collected with BUW-participants through retrospective interviews to further elucidate the initial question of a development in decision-making through the BUW.

*Keywords:* education for sustainable development, decision-making, science competitions

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Oral Presentation

# Changing perspectives and strengthening the environmental identity of primary school children through storytelling

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## ABSTRACT

After more than a decade of educational initiatives for sustainable development, the formation of the environmental consciousness of children is unfortunately still relevant. We believe it necessary to try and deconstruct the complex set of ideas that we are presented with in a more efficient way, in order to gain a better understanding of the problems faced when educating children on sustainable development. Wishing to focus on the construction of the environmental identity of primary school children, we postulate the importance of establishing an adequate framework to put the environmental problems they face into perspective. The great potential of the use of storytelling in schools gives us the possibility to investigate the issue, in order to test the following research hypothesis. 1- Strengthening the environmental identity of elementary school students is possible through the use of a newly developed storytelling method. The primary purpose is to reinforce of students' ability to discuss this topic. The acquisition of new perspectives through the process of a change of perspective makes this possible. Therefore, it is likely to evoke a possible change of attitude regarding the understanding of environmental problems (Rietz, 2017). 2- A change in perspective has a positive effect on the development of students' environmental identity and on these additional elements (environmental knowledge, attitudes to and inclusion of nature). In order to test these hypotheses, a mixed methods design was first piloted and then implemented with 20 primary school classes (n= 380) in the Canton of Appenzell Ausserrhoden (CH). The intervention in these classes was filmed. The effects of the intervention were tested in two different ways, with the reading skills of the students also being taken into consideration. The effect on the 1<sup>st</sup> and 3<sup>rd</sup> graders was measured by means of drawings (pre / post). The effect of the intervention on the 4<sup>th</sup> and 6<sup>th</sup> graders was measured quantitatively (pre / post), using valid instruments (Liefländer, 2012). Based on these findings, we will carry out an empirical based use of storytelling, in order to attempt to strengthen the environmental identity elementary school students.

*Keywords:* environmental identity, perspective taking & storytelling

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Oral Presentation

# Green cheers you up – the school garden a place to feel good

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## ABSTRACT

The aim of biology education is to promote scientific literacy for all pupils. This is the basis for further learning and activities. Scientists and teachers are in charge of researching and selecting learning content (what) and learning pathways (how). The school garden is an ideal learning place to open up the reality. In the garden students encounter the individual and the sensually. Speaking of abstraction, general principles in the sense of scientific basic education can henceforth be recognized - and learned. As a learning place the school garden is: a (special) place to promote the contact between humans and nature, it is an area for explorative learning, to provide manifold sources for interdisciplinary teaching and it is a place for nutritional and environmental education (Blair 2009; Jäckel 2010).

But the school garden is much more than a place of learning. As a manageable and concrete excerpt of reality, eg. as an ecosystem or horticulturally used area it becomes a learning content. Through the horticultural or scientific-practical work, nature experiences can be made and scientific findings are obtained.

Practically, this works best when students can make decisions independently, work together and experience success (self-determination theory, Deci & Ryan 2004). These are conditions for intrinsic motivation and well-being. In general, school gardens may take over a significant function in view of health education and wellness of children and adolescents. As a consequence, practical work and other activities are letting the school garden become a place for physical agitation, relaxation and stress reduction.

As in the study presented, we examine the question: *What effect of well-being and social-emotional competences has garden work on pupils in the sixth grade?*

The first results of the Mood Questionnaire show a higher value of good mood which indicates more social interactions compared to school lessons in the classroom. The school garden is a place to feel good. And so, he fulfills a basic requirement for learning.

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### Key Note

# BigPicnic - A European project at the interface between environmental and health education

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### ABSTRACT

Food Security is an umbrella concept used in research and public policy in many different ways. The continuous attempts to come up with one shared operational concept reflects the complexity of the technical and policy issues involved. When it comes to designing and running public campaigns to raise awareness and initiate change in societal food systems it is challenging to communicate. However, Food Security is an open-ended, multifaceted social issue with conceptual links to science and thus a so-called socio-scientific issue (SSI). In science education research and in science teaching SSIs are used because they are challenging to negotiate and to resolve, and therefore ideal to create a contexts for bridging school science and the lived experience of students. The European educational project “Big Picnic: Big Questions - engaging the public with Responsible Research and Innovation on Food Security”, joins Botanic Gardens and Universities all over Europe while engaging the public with a variety of topics related to the sub-concept “Food Sovereignty”. Partner organisations develop educational activities emphasizing ecologically appropriate production, distribution and consumption, social-economic justice and local food systems as ways to tackle hunger and poverty and to guarantee sustainable food security for all people. Agrarian reform projects, agro-ecology and diversity issues related to health and wellbeing as well as local knowledge and climate justice are advocated. The goal is to support visitors (age 6—99) to develop knowledge, attitudes and skills and make informed decisions when buying, consuming and wasting food. To face the challenge and reach target groups, which are not every day visitors at botanic gardens, the Big Picnic network adopts new approaches in designing and evaluating educational programs. “Co-Creation” and “Team Based Inquiry” are key strategies applied to meet the goals the European idea of Responsible Research and Innovation is aiming for. Following the research paradigm of action research, botanic garden educators are evaluating how the public receives their educational approach. Preliminary results show that the “culture of eating” plays a substantial role in decision-making and appears to be a fruitful hook for educational approaches.

*Keywords:* Food sovereignty, Botanic Garden Education, BigPicnic

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Oral Presentation

# Do secondary school students think critically about health issues with high societal relevance?

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## ABSTRACT

Educational standards in German-speaking countries expect students to consider scientific issues of high societal relevance, assess them under different angles and thus make informed decisions. Secondary school biology curricula indicate a variety of these issues, often with regard to health education. In science education research, scientific issues of high societal relevance are referred to as socio-scientific issues (SSI) if they are debatable, open-ended, challenging and realistic, and produce a social or moral dilemma. According to the international science education discourse, the examination of SSI requires scientific knowledge, moral reasoning, ethical evaluation, and the reflection of one's own values and emotions. While the latter three factors are present in many decision-making models, it is the scientific evidence that is the basis of decision making in the SSI context. However, hardly anything do we know whether and how deep students need to delve into this evidence to experience and practice a thinking process similar to critical thinking applied in science, which is a reflective and analytical style of thinking based in logic, rationality and synthesis. Although critical thinking is widely considered a fundamental educational ideal and key to scientific literacy, there is little knowledge about the role science education plays in supporting students to think "critically". The purpose of our work is to find out which aspects of critical thinking arise when students get involved with health topics. With an action research approach the teacher (presenting author) confronted students ( $n = 25$ ; 10<sup>th</sup> grade; aged 15 to 17) with a variety of health-related SSI in standard biology lessons following the Austrian 10<sup>th</sup> grade biology curriculum. Interviews with students and student discussions were audio-taped, transcribed and qualitatively analysed using content analysis. Preliminary results indicate that students' critical thinking is affected by their current motivation to deal with the given task, their emotional attachment to the issue, the depth and breadth of their knowledge, but also classroom conditions and aspects of performance assessment. With reference to these preliminary study results and science education research literature, we raise the questions: How should teachers deal with the challenge of drawing on a profound body of knowledge related to a given SSI and give sound feedback to students on how deep they have delved into given evidence to meet standards of critical thinking?

*Keywords:* critical thinking, socio-scientific issues, classroom-based action research

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Oral Presentation

# The importance of affect-laden constructs and beliefs for predicting teachers' intentions about teaching cancer education

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## ABSTRACT

Science classrooms and science curricula across Europe and beyond increasingly cover health-related topics. At the same time, researchers have more and more investigated the perspective of science teachers for analyzing factors influencing their intention to teach health-related topics. These kinds of studies found that teachers differ in their intention to teach health-related topics as some of the teachers perceive teaching these issues as more complicated and more difficult than others. Interested in understanding why the intention of teachers varies, researchers, for example, studied teachers' beliefs. Studies showed that beliefs determine higher-level constructs such as teachers' attitudes or their perceived self-efficacy, which, in turn, influence intention.

In this presentation, we will focus on cancer education, a specific health-related topic and a mandatory theme in the upper secondary biology curriculum in half of the German federal states. Although the curricular guidelines for cancer education focus primarily on cancer biology, teaching about cancer is likely to evoke emotional responses and feelings of personal concern. For this reason, we focus on teachers' beliefs and, in addition, assessed two affect-laden constructs: anticipated concern to teach cancer education and psychological distance to cancer, measures embracing personal experiences and feelings of proximity to cancer.

Utilizing the framework of the theory of planned behavior, we present findings related to how beliefs about the positive and negative consequences of teaching about cancer determine teachers' attitudes, how beliefs about normative referents and role models determine the perception of social pressure to teach cancer education and how beliefs about internal and external control factors determine teachers' self-efficacy and their perceived autonomy. For anticipated concern and psychological distance, we present findings of an exploratory study about the interplay of affect-laden constructs and teachers' intention. We discuss possible consequences for teacher training and – at a more general level – how the findings can inform the integration of health-related topics in science classrooms.

*Keywords:* cancer education, theory of planned behavior, affect-laden constructs

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### Key Note

# **An assessment of the factors influencing environmental health in urban areas – case study for the city of Athens**

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### **ABSTRACT**

Cities around the world face environmental health challenges including air pollution, overheating and heat waves, energy poverty and climate change. In this paper, an assessment of the factors (practically urban parameters) which influence environmental health is made. Such parameters relate to (a) the aspect ratio which influences the stagnation of air close to the ground (and thus traps pollutants and heat), (b) land cover (type of materials) and anthropogenic heat sources which control land surface temperature, (c) greenery which by affecting evapotranspiration results in the enhancement or the weakening of the cooling effect of vegetated areas, (d) sky view factor (SVF) which may impose thermal loads and increased glare in areas with poor SVF, (e) land/air surface temperature and buildings characteristics (age, insulation, orientation) which control energy consumption and may result in energy poverty, etc. Furthermore, special consideration is given in the analysis of the links between air temperature and mortality, especially in the event of extremely low temperatures and heat waves. Results are exemplified for Athens, are discussed in view also of climate change, are organized in view of an urban typology and are assessed in view of supporting plans for the mitigation of environmental health problems in cities.

*Keywords:*

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Oral Presentation

# The Use of Smartphone Apps for Environmental Education and Participation in University Education and Citizen Science

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## ABSTRACT

With today's wealth of information sources, differentiating unproven assertions from evidence-based reasoning has become more difficult for the general public. The credibility of science as an evidence-based foundation for decision making is not undisputed anymore. However, a multitude of issues require active societal participation. Implementing adaptation strategies to mitigate environmental change is just one example. Modern Information and Communication Technologies (ICT) provide new pathways to facilitate societal participation. One's own experience through participation in scientific discovery leads to a better understanding of the scientific approach and builds trust in scientific results. Investigating the own environment is a good starting point for motivating participation. This paper presents the teaching concept "Explore Nature, Explain through Research, Learn in your Environment (ENERLE)". ENERLE utilizes structured environmental observation as a basis for scientific reasoning and evidence-based conclusions. Mobile smartphone apps are used as a communication and participation approach. The apps are available in different languages to support internationalization in the context of education and integration in the context of societal change. To motivate participation, ENERLE is implemented in one's own living environment through thematic "Learning, Exploring and Activity Paths (LEAPs)". Here interesting phenomena are explained at specific locations. Building upon this background information, participation is invited through the smartphone apps. The apps provide an immediate short feedback to draw conclusions or provide additional information based upon the observations. All observations and data are shared to facilitate further analysis. The approach was tested and evaluated with students, citizens and migrants. First results of the evaluation are presented and discussed.

*Keywords:*

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Oral Presentation

# Surviving Science in the Post-Factual World

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## ABSTRACT

We live in a time of unprecedented access to information and data. The internet has provided the means to access large databases and web-based platforms to extract and analyze this information. However, it is also the source of disinformation, trolling, “bots” and “memes”. Despite the overwhelming evidence for global phenomena such as global warming and climate change, paid purveyors of false data and disinformation and even political figures, have tried to cast doubt on science. In the United States there are three factors which have contributed to the erosion of public sentiment towards science and scientists in general. The first, is the deliberate abuse of data by marketing firms to sell a product, the second is the effort by industry to create doubt about any evidence that could be “bad for business”, and lastly, a concerted effort by proponents of intelligent design to prevent science, evolution in particular, being taught in public schools. The net result is we no longer have a populace that is capable of discerning fact from fiction, bolstered by internet algorithms that amplify false truths, and commercial ads that defy logic. Examples include “clean diesel”, “environmental regulations kill jobs”, “fake news”, and “global warming is a Chinese hoax”. It has had a profound effect on health care, environmental protection, and public education. Further, it makes it all too easy to cast aspersions on science as a whole, when, on rare occasion, a scientist is found guilty of academic malfeasance or fraud. This review will provide a brief discussion of what science is, reveal the playbook used by proponents of intelligent design known as “The Wedge”, and lay out the fundamental principles used by the “merchants of doubt”.

*Keywords:* fake news, greenwashing, merchants of doubt

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### Key Note

# Creating Healthy Communities through Policy, Environment, and Social Change

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### ABSTRACT

Tobacco use, obesity, poor nutrition and inadequate physical activity have become major public health problems across the United States and most developed countries in the world. Several research studies have supported the hypothesis that comprehensive community level campaigns are necessary to influence change with a focus on policy and environmental change.

From 2000-2015, Dr. Maddock ran the research and evaluation arm of the Healthy Hawaii Initiative, a comprehensive state-wide approach to reduce chronic diseases across all people in Hawaii. Using a social-ecological approach, the initiative conducted interventions in schools, worksites, communities, with physicians and through mass media programs as well as creating policy and environmental change. Successful policy change interventions included smoke free workplaces, raising the age of tobacco use to 21, smoke-free beaches and parks, complete streets, safe routes to school surcharge on moving violations and additional physical exam requirements for school age children. Results indicated positive changes in health behaviors across the 15-year period, leading Hawaii to be ranked the healthiest state in America.

These types of campaigns have led to a change in the training of public health students. Traditionally in the USA, health policy and management, environmental health and health promotion have been separate courses offered by separate departments. The need for public health practitioners to work across all of these sectors is essential for success in today's world. This talk will discuss the new integrated core for the Master's in Public Health degree and how lessons learned from this core and in comprehensive community campaigns can be implemented in international settings.

*Keywords:* physical activity, nutrition, obesity

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Oral Presentation

# Physical Activity and Climate Change: Clear and Present Danger?

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## ABSTRACT

By the year 2100, the Earth's mean temperature could increase 1.8°C to 4.0°C, due in part to the release of greenhouse gases (GHG) into the environment. This increase in average daily temperature may negatively impact personal health, *directly* through GHG emissions and increased temperature, and *indirectly* through climate change's impact on the environment. However, how climate change impacts another global health crisis, obesity and physical inactivity, is less clearly understood. In this paper, we perform a systematic review of English-language peer-reviewed published papers to understand how climate change may impact physical activity levels in the future, one of the primary modes of prevention against and treatment for obesity. Eight manuscripts reported on individual physiological responses to excessive heat during physical activity primarily among elderly individuals, with 11 studies providing broad implications for physical activity trends over time in conjunction with climate change. Overall, excessive heat exposure during bouts of physical activity appears to have greater impact on elderly persons whose bodies are less able to thermoregulate their core temperature, placing increased strain on their cardiovascular and respiratory systems. As elderly individuals consistently report higher levels of cardiovascular and respiratory illnesses than the overall population, climate change may potentially exacerbate these existing conditions during physical activity. More generally, increased mean daily temperatures may decrease the prevalence of physical activity, especially during the summer months, with this phenomenon potentially resulting in further increases in sedentary behavior. Our review suggests climate change will decrease overall frequency of physical activity in the world's population, as well as the intensity of individual bouts of activity, with excessive heat specifically impacting already vulnerable and populations with compromised health. As the Earth warms human bodies will become less able to thermoregulate their core temperature, thereby increasing stress on vital organs and the likelihood of life-threatening health issues.

*Keywords:* physical activity, systematic review, climate change, thermoregulation

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Oral Presentation

# A Portfolio of Partnership to Improve the Health of the LGBT Community: Lessons Learned

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## ABSTRACT

**Overview:** In this presentation, I will highlight a 20+ year portfolio of to improve the health of the LGBT community. I will give emphasis to the value of using community lay staff in research, and the translation of research to practice and practice to research. Lessons learned will be discussed.

**Description:** Community-academic partnerships can increase *Real-World Validity, Community Acceptability, Likelihood of Sustainability, Community Capacity, and Member Skills*. However, often community-academic partnerships involve “doing *to* or doing *for*, not doing *with*.” Partnership involves community working *WITH* academia toward common shared goals *Transcendent* partnership involves working together on endeavors of mutual interest irrespective of community or academic roles. Partnerships which synthesize unique scientific and programmatic can result in programs and interventions that are scientifically-efficacious, programmatically valid, and responsive to community needs, values, and priorities.

**Lessons Learned:** (1) Importance of personal relationships; (2) Development of capacity and sustainable systems may yield longer-term public health impact than any single intervention; (3) Significant individual-level outcomes may be beneficial to individuals, but may not lead to significant population-level changes in health behavior; (4) Continued research funding may not be justified in many public health domains; (5) Need to empirically respond to emerging public health threats in real-time; (6) Need to move from science of reductionism to science of complexity; (7) Need to move from a “political” science to a “responsive” science; (8) Integral to all of our behavioral research is PEOPLE; (9) As we move from institution-based to real-world application, we must give greater attention to the “human being” in human subjects research; (10) Public health science, no matter how well-intended and altruistic, is never value-free; (11) Researchers need community as much as community needs researchers; and (12) Researchers cannot have respect, justice, and benevolence without first giving critical self-reflection to their own motives, aims, and rewards for their chosen path of science.

*Keywords:* Community-Academic Partnership: Lessons Learned

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Poster

# School Health Education: from Biomedical to Socioecological Approach

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## ABSTRACT

School health education has been a matter of intense research. Some works have focused on the dominance of the biomedical approach and the need to encourage health promotion in textbooks and in teaching. The classical biomedical approach to health, taken as a mere absence of disease, has a limited vision of health, with implications for its understanding by teachers and students, and especially for an effective construction of individual and collective healthy practices. A possibility to overcome these difficulties is complementing the biomedical approach with another health approach to surpass its limitations. The present study intended to present a critical review of the literature aiming at analysing the theoretical and practical indicators that differentiate health approaches and so identifying the most appropriate ones for school health education.

The corpus of this study consisted of articles published in peer review scientific journals. Four databases were used, two in English (Scopus and ERIC) and two in Latin language (LILACS and SciELO). All abstracts of the obtained 5717 articles were read but only 974 appeared to discuss theoretical health aspects or health practices. Of these, 644 were excluded because they were in books, proceedings or thesis. Other 161 were eliminated because they were repeated articles or not appropriate to the study, as they did not discuss different ways of thinking and acting in health. The final 169 relevant articles were fully analysed.

Five health approaches were identified: religious, biomedical, ethnomedical, behavioural and socioecological. Biomedical and socioecological approaches were identified as presenting very distinct characteristics, the former being more traditional and strongly rooted in the modern technological society and the latter of multidimensional features and still in progress.

School health education can benefit from the recognition of these two approaches to be used complementarily: biomedical approach with emphasis on diseases and prevention; socioecological approach giving students the opportunity to reflect on multifactorial aspects influencing their own health and so empowering them to exercise their healthy choices as free citizens and promoters of their own health and of their community.

*Keywords:* Literature review; School Health; Health approaches

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Poster

# Chemical experiments with "vegetable ivory"

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## ABSTRACT

The Tagua nut, which is also known as "vegetable ivory", is the seed of the Tagua palm (*Phytelephas macrocarpa*). It belongs to the family of *Arecaceae*, colloquially called palm trees. Literally, the genus name means "elephant plant or vegetable ivory". It is native to the tropical rainforest of north-western South America (Ecuador, Panama to Brazil). There, the palm trees are cultivated in plantations by local workers, and their fruits are picked up from the ground and then processed. The cultivation of the Tagua palm creates valuable jobs in very poor regions of South America.

The dried and processed nuts are used to make buttons, carvings and jewellery. In addition to the attractive appearance, which is very similar to animal ivory, the Tagua ivory also has excellent mechanical properties. In recent years, the Tagua nut is gaining in popularity, as more and more manufacturers of piano keys, buttons for military uniforms or other craft sectors resort to vegetable ivory in the interests of the environment.

The outstanding mechanical functionality of Tagua ivory is based on the molecular structure of the seed. Although no mineral phase is present as a strengthening structure, the nut has outstanding stability. Even though it does not quite possess the complex, extrinsic breaking strength of animal ivory or bone, it is a very good alternative because of its elegant appearance, good processability and environmentally friendly production. Chemically it is interesting that the nut consists almost exclusively of mannan, the polymer of mannose.

On the poster, in addition to basic information about plant, fruit and occurrence, some experiments for chemistry lessons are presented. These include investigations to determine the hardness of the nut using the Mohs' hardness scale and experiments on the hydrolysis of mannan and the identification of mannose as a basic element of mannan apart from other sugars such as glucose and fructose. Finally, possible applications of the topic and the experiments in chemistry lessons and sustainability aspects are discussed.

*Keywords:* Tagua, vegetable ivory, mannan

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Poster

# Novel food Guayusa tea: An alternative to energy drinks?

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## ABSTRACT

In Western culture, stimulants such as coffee or tea are an integral part of everyday life. They belong to the most important commodities and according to food law belong to food items. In the course of globalization we see an increase in more and more new or rediscovered products. Currently, these are so-called "functional foods", which describe food with alleged health benefits. One of these is the Guayusa tea. It is said to promote concentration and have antioxidative effects due to its high caffeine and tannin content.

Guayusa (*Ilex guayusa* LOES.) is an evergreen tropical tree of the holly family (Ilex) and a close relative of *Ilex paraguariensis*, the well-known Yerba mate. Guayusa is traditionally enjoyed as tea among the indigenous peoples of South America. Today, Guayusa is for example sustainably and traditionally grown, freshly harvested and processed in collaboration with the indigenous Quichua Indians in the northern Amazon region of Ecuador, the province of Rio Napo. It is then shipped to Europe, where it is marketed by dealers of natural products.

To begin with, the plant and the respective extraction of the tea are shown on the poster. Then the most important ingredients are discussed. After that, some experimental studies of the caffeine content of Guayusa tea are presented, which can be implemented in chemistry lessons with materials available in school. This can help students of senior classes to find out about the caffeine content in the raw leaves and the correlation between the caffeine concentration and the amount of used tea and the time of brewing. The students can then compare their results to established caffeinated drinks such as coffee or energy drinks. For this purpose, a photometric method, a Soxhlet extraction with subsequent purification and a thin-layer chromatography are used.

Finally, the integration and possible applications in chemistry lessons are discussed. In addition to technical-chemical and biological-physiological contents, questions of health education regarding the students' coffee consumption play an important role. Questions concerning sustainable trade with regard to working and cultivation conditions can be discussed as well.

*Keywords:* Guayusa, caffeine

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Poster

# Cancer career counseling – more education is needed to highlight environmental health career paths

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## ABSTRACT

**Background:** The cancer control continuum is a framework including etiology, prevention, detection, diagnosis, treatment and survivorship. The framework evidences the varied breadth, depth, and cross-cutting nature of cancer career opportunities. Cancer research careers can be as diverse as microbiology, pharmacology, clinical research, epidemiology, environmental science, psychology, and behavioral health. Many environmental factors have been associated with cancer risk, including chemical exposure, viral infection, and health behaviors including diet, physical activity, and sun exposure. Additionally, socioeconomic and geographic factors affect cancer outcomes. How much do students, particularly minority students, really understand about cancer risk, the range of cancer research careers, and how they can begin on that career track?

**Methods:** Undergraduate students (n=857) at a mid-sized US university with a high percentage of at-risk and first generation students completed paper-based questionnaires about cancer and its related careers.

**Results:** Responses indicated low knowledge of cancer risks. For all but one cancer risk question, less than half of respondents answered correctly; 63% correctly identified the race/ethnicity with the highest incidence of breast cancer in the US. Nearly half of respondents (49%) indicated they or an immediate family member had been diagnosed with cancer. Most students associated cancer careers with bench science (biology, 88%; genetics, 85%; chemistry, 65%) and healthcare (medicine, 87%; nutrition, 54%; nursing, 53%) or public health (62%), but relatively few students associated applied fields: environmental science (29%), industrial hygiene (21%), statistics/mathematics (20%), and psychology (17%). Most respondents (69%) received career counseling in high school. Only 4% received career counseling that discussed cancer research, 10% of respondents had ever considered a career in cancer research, and 21% indicated they were “very” or “somewhat” interested in a cancer research career while 40% were neutral.

**Conclusion:** Survey results indicated most respondents did not associate environmental studies or industrial hygiene as being fields related to cancer research. It is possible that students were unfamiliar with these fields of study in general. Results were somewhat inconsistent between interest in and consideration of cancer research careers. Career counseling may need to educate students about a wider range of career opportunities to recruit a diversified pool of cancer researchers.

*Keywords:* Cancer, Research careers, career counseling

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Poster

# Drought and Public Health: Bringing the Science We Know into Practice

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## ABSTRACT

Cycles of drought have affected North America for the last 10,000 years. Droughts can last from a single season to many decades and can affect from a few hundred to millions of square miles. Drought can affect human health in many ways. Some drought-related health effects are experienced in the short-term and can be directly observed and measured. However, long-term drought conditions can result in indirect health implications that are not always easy to anticipate or monitor. In this paper, we review the literature on drought and its effect on public health and make recommendations on what public health professionals can do to address this issue among North Americans. Specific issues of inclusion are:

- Sources of water affected by drought may have higher concentrations of pollutants, which can lead to contaminated fish, harmful blue-green algal blooms, and increased levels of bacteria.
- Water bodies can become stagnant, providing breeding grounds for mosquitos. This can lead to increased rates of mosquito-related illness, such as West Nile Virus.
- Drought can cause crop failure and can lead to food shortages.
- Dry, dusty conditions can lead to wildfires and dust storms, which can increase the amount of particulate matter in the air. This can worsen chronic lung problems, such as asthma or chronic obstructive pulmonary disease (COPD). In addition, dust storms can spread bacteria, viruses, and fungi that can cause illness.
- Stress from economic or job losses may lead to increased anxiety and depression.

*Keywords:* drought, health impact, public health

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Poster

# Factors Influencing the Use of Alternative Medicine and Evidence- based Medicine (EBM)

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## ABSTRACT

Health Literacy is a central goal in science education and especially in biology classes. Up to now, the topics *Alternative Medicine* and *Evidence-based Medicine (EBM)* have only played a marginal role in German biology classes (Graf 2006) - even though the use of *Alternative Medicine* has been widely utilized for years (Graf and Lammers 2015). According to the German Health Interview and Examination Survey for Children and Adolescents (KiGGS) 50.8 % of all children and adolescents aged 0 to 17 years, who participated in the survey, reported to have used at least 1 medication during the last 7 days prior to the examination (Knopf 2007). This trend emphasizes the need of investigating the variables that influence people's intention to use *Alternative Medicine* and *Evidence-based Medicine*. Thus, a study was conducted by us to determine the factors associated with the use of the medical forms. Students of teaching biology and upper grade students in Germany participated in the survey. Based on the *Theory of Planned Behavior* (Fishbein and Ajzen 2010), the study measures behavioral, subjective and control beliefs to use *Alternative Medicine* and *Evidence-based Medicine*. In order to quantify behavioral beliefs, the participants were asked to specify the most frequently perceived advantages and disadvantages of using *Evidence-based Medicine* and *Alternative Medicine*. Furthermore, the study determined the most important people or groups of people who could approve or disapprove the participants of the use of the medical forms (subjective beliefs). Control beliefs were measured by asking the participants to specify the perceived barriers or facilitating factors which could make it easier or more difficult to use *Alternative Medicine* and *Evidence-based Medicine* (Francis et al. 2004). These beliefs are needed in order to develop an appropriate health awareness training/health education in *Alternative Medicine* and *Evidence-based Medicine* - especially for science classes (Graf 2007) - and finally bring science into practice. Some important results of the survey will be presented in the poster.

*Keywords:* Evidence-based Medicine (EBM), Alternative Medicine, Health Literacy

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Poster

# Fashion vs. Environment - towards an environmentally friendly clothing sector

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## ABSTRACT

Nowadays, we wear clothes not only for practical reasons but also as an expression of social status. This led to an increase in clothing production and consumption within the last decades. Fashion companies contribute to this trend by bringing up new collections each season. Between 1900 and 2008 fibre production increased from 4 million to 70 million tons worldwide. During all steps of clothing production environmental problems arise. This leads to the question how we could produce and consume clothes in a more sustainable way.

By the example of a cotton t-shirt, the environmental impacts of clothing production and consumption will be analysed. Considering 'what if' scenarios of available studies, it will be discussed how producers and consumers could contribute to sustainability in the clothing industry.

The first step in the lifecycle of a t-shirt is the material phase, which is the cultivation of cotton. According to the German Federal Environmental Agency, cotton production accounts for 10 % of the worldwide pesticide market and 25 % of the insecticide market. In a next step the t-shirt is produced. The production phase includes processes like manufacturing the yarn, knitting, bleaching and dyeing. Here, critical factors are the consumption of water and energy, greenhouse gas emissions as well as the application of chemicals such as bleach and dyes.

In a third step, the consumer phase, the consumer decides upon which clothing items are purchased and how they are disposed. Only 4 % of old clothes in Germany are resold in German secondhand stores. All phases of this process could contribute to a more sustainable clothing sector. In the material phase, organic cotton could replace conventional cotton. In the production phase, the elimination of bleach could reduce the consumption of water and energy by more than a half. In the consumer phase, the consumers choose how frequent, how many and which clothing items are purchased and how they are disposed. According to a study by the Danish Environmental Protection Agency, doubling the lifetime of a t-shirt will decrease the primary energy consumption by 30%.

In conclusion, both producers and consumers could help to mitigate the negative impacts on the environment. Bringing together producers' and consumers' interests and environmental issues will be one future challenge.

*Keywords:* environmental impacts, clothing production, sustainable consumption

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Poster

# Does glyphosate kill honeybees?

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## ABSTRACT

Glyphosate is one of the most controversial and widely used pesticides in the world. According to the World Health Organization's (WHO) cancer research agency, glyphosate is likely to be carcinogenic and contribute to the decline in biodiversity. According to the EU authorities ECHA and EFSA, however, glyphosate should be completely harmless to humans and animals, as it blocks an enzyme that is said to occur exclusively in plants and bacteria.

Opponents of the glyphosate pesticide launched a discussion to ban the use of the herbicide. In consequence, an extension of the approval of the herbicide failed in autumn 2017, but a ban was not granted.

Some of the animal species affected by the decline in biodiversity are bees. In particular, the honeybee has to endure the consequences of the use of the pesticide glyphosate. The honey bee's intestinal flora contains a bacterium that contains this enzyme, which is blocked by glyphosate. This finding was recently confirmed by the PNAS (Proceedings of the National Academy of Sciences of the United States of America), because it was not clear before whether the bacteria in the intestinal flora of honeybees belong to the glyphosate-sensitive bacteria or not.

The study conducted by Erick Motta and others shows that honeybees exposed to the herbicide glyphosate die more frequently when exposed to pathogens than honeybees not exposed to the pesticide.

It can be assumed that there are other influences that are driving the deaths of honeybees and other pollinating insects. However, since the use of glyphosate is one of the influencing factors that could be controlled, it is worth considering whether it makes sense to partially counteract bee mortality by banning the herbicide.

*Keywords:* honeybees, glyphosate

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Poster

# From the Bathroom to the Sea - Microplastics: The Invisible Danger

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## ABSTRACT

Every day we encounter it in different forms. Sometimes it is solid, sometimes it is soluble or insoluble. But it is never biodegradable. We are talking about the well-known plastic, which is bad for the environment, not only because of its long decay period of about 400 years. Again and again, images of animals pop up in the media whose bodies are full of plastic waste and have died because of this. By now everyone should know that it's better for the environment to use recyclable products instead of disposable plastic.

But apart from the obvious use of plastic to cover for example fruits, vegetables and cosmetics, there is the so-called "microplastic" many people don't know about. Each of us has products with exactly this microplastic at home in the form of creams, shower gels, toothpaste, scrubs, ... Every day, microplastics enter the environment through the sewage system and increase environmental damage. Because it is an important issue that concerns everybody and a negative environmental impact that can be reduced by anybody, we show what microplastic is and where it comes from. In addition, our presentation shows what the most common plastic in cosmetic and personal care products is, so that everyone has the opportunity to decide against a product with microplastics.

But why is microplastic so harmful? Since microplastics are very small pieces of plastic (> 5mm), it is difficult to remove them from the environment. Based on the studies of "BMU", "NOAA", "Thompson, C. J. Moore, F. S. vom Saal and S. H. amongst Swan" and "Barnes" it is explained which effects microplastics can have on our environment.

In addition, the question is answered what each one of us can do to decrease our use of microplastics and in this way help to protect the environment.

*Keywords:*

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Poster

# Electric vehicles: the future mobility of a sustainable city?

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## ABSTRACT

According to the United Nations, in the next 30 years about 70% of the world's population will probably live, commute and work in urban areas (UNDESA, 218). To provide enough public infrastructure and decent living conditions for the residents, the cities need to reinvent their development strategy. Mobility and energy may be the two most important challenges to be faced by the cities, in order to avoid pollution, energy waste and congested streets. Among the strategies for the development of sustainable cities, electrical vehicles emerge as a possible technical solution to this issue, since it has the potential to connect urban mobility problems with clean alternatives. The current uses and innovations of electrical vehicles are here therefore demonstrated, in order to assess the future perspectives and challenges for this technology. Furthermore, concepts like the electrification of taxis or public transportation will be discussed as a viable alternative to energy use inside a big urban center. So, it is safe to affirm that the integration of mobility with the electrical grid inside the cities is the path forward – if this will be related to personal-use vehicles or public transportation types, there is no clear answer yet, since the personal-use vehicles still occupy a physical (and already scarce) space inside the cities. Consequently, the data presented here aim to assist a quality overview over the real role played by electrical vehicles inside the sustainable cities' development ideas. The chosen work scale (city level) allowed the analysis of the effectiveness rate of using electrical vehicles according to different theories and provide several different panoramas for the future of this technology.

UNDESA – United Nations Department of Economic and Social Affairs. 2018 Revision of World Urbanization Prospects. Available at <https://population.un.org/wup/> [Accessed in November 8<sup>th</sup> 2018].

*Keywords:* Sustainable city; Electric vehicles; future perspectives

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Poster

# Are We Damned to Microplastics?

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## ABSTRACT

In today's world plastic is everywhere. From the packaging of the food we are eating to the cars we are driving. The World Bank estimated that 140 million tons of plastic trash are generated each year and in 2014 roughly 5.25 trillion plastic particles were floating on the surface of the sea. While the plastic industry has grown exponentially since its formation, the question of how to deal with these enormous amounts of waste has lacked behind. This conundrum proves to be an environmental strain, especially for the marine environment. It is however not only the marine environment that is effected by this exes of plastic. In recent years researchers have more and more concerned themselves with the questions of how are we as humans affected and is there a need for greater concern? In our poster we aim to answer the questions, what are plastics and microplastics, how are they disposed of, how do they enter the environment, what effects do they have on the marine environment and humans as well as what efforts are and should be made to change the current bleak predictions for the future. While it is certainly unrealistic to get rid of all plastic it is important to educate people on the dangers that come with it and what each of us can do to help lessen the problem by reducing the waste we create as well as dealing with it responsibly.

*Keywords:*

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Poster

# INSECTS AS FOOD: Potential to be a Sustainable Food Source for Humankind?

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## ABSTRACT

Our current way of life in Western society is in conflict with environmental sustainability. In particular, livestock farming for meat production is considered to be critical (Bartz et al., 2014). The demand for animal proteins is increasing in connection with the growing world population (Dossey, Morales-Ramos, & Rojas, 2016). Animal farming for meat production affects many ecological fields and can have negative consequences for nature. Livestock farming has an impact on the following environmental factors: access to water, land usage, and emissions from meat production. Ethical issues (species-appropriate animal husbandry, environmental responsibility), health concerns (animals contaminated with drugs and antibiotics) and economic concerns (generally high monetary and time costs for animal farming, housing and processing) also call for a shift away from our current consumption orientation towards other alternatives. That means a shift to alternative solutions that secure the supply of proteins and other nutrients (Dossey et al., 2016).

One of the oldest alternatives to the conventional meat industry is the consumption of insect - "meat". For some cultures, the consumption of insects is already part of their everyday life. Not only these cultures, but also long before them, our Stone Age ancestors knew about the advantages of eating insects and this saved them some risky cost-intensive hunts (Kornfeld, 2016).

The poster takes a critical look at the sustainability potential of edible insects. Before insects can be recognized as part of the diet in Western societies, many obstacles have to be overcome. The poster focuses on the advantages and disadvantages of insect breeding, but also the challenges in Western societies will be reviewed. A final question is how and whether insects can be established as meat equivalents in Western societies (Meixner & Mörl von Pfalzen, 2018).

Bartz, D., Benning, R., Chemnitz, C., Gura, S., Mari, F., Kriener, M., et al. (2014). *Fleischatlas: Daten und Fakten über Tiere als Nahrungsmittel*. (8. Auflage, Juli 2014). Retrieved November 12, 2018, from [https://www.boell.de/sites/default/files/fleischatlas\\_1\\_1.pdf](https://www.boell.de/sites/default/files/fleischatlas_1_1.pdf).

Dossey, A. T., Morales-Ramos, J. A., & Rojas, M. G. (Eds.) (2016). *Insects as sustainable food ingredients: Production, processing and food applications*. London, United Kingdom: Academic Press is an imprint of Elsevier.

Kornfeld, M. (2016). *Prehistoric Hunter-Gatherers of the High Plains and Rockies: Third Edition* (3rd ed.). s.l.: Taylor and Francis.

Meixner, O., & Mörl von Pfalzen, L. (2018). *Die Akzeptanz von Insekten in der Ernährung: Eine Studie zur Vermarktung von Insekten als Lebensmittel aus Konsumentensicht. Studien zum Marketing natürlicher Ressourcen*. Wiesbaden: Springer Gabler.

**Keywords:** Entomophagy, edible insects, sustainability

**Health, Environment & Education, 2018**

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Poster

# Is India Outpacing the EU? – Two Perspectives on Solar Power

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## ABSTRACT

Increasing global concerns about the environment encourage countries to promote development in renewable power generation. The presented poster will review the ambitious power goals set by India for 2022, and the European Union for 2020 respectively, and will seek to understand how these regions will achieve their energy goals in specific relation to their solar targets.

The data for the research poster is collected from a wide range of sources and will present the challenges that arise from the implementation and growth of such large-scale schemes across regional or national boundaries. Geographical conditions as well as energy demand and its future prospects in India and the EU will be contrasted. The purpose and feasibility of the two solar goals, along with the likelihood of achieving them, will be assessed taking into account critical views of scholars. Furthermore, information from media sources will also be presented to draw attention to the gap between public knowledge and academic opinion in the specialist field of renewable energy.

The poster aims to give an insightful, but critical overview on the possibility of both regions achieving their solar targets.

*Keywords:* solar, India, EU

**Health, Environment & Education, 2018**

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Poster

# Assessing the impacts of flood control infrastructures and potential alternatives

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## ABSTRACT

Flooding accounts for more weather-related disasters than all other types combined, according to a recent UN study. Traditional flood control infrastructures, such as levees, dams, and drainage pumping, have been relied upon for centuries to provide protection, but the frequency and severity of flooding continues to increase. According to the European Environmental Agency, flooding is expected to increase seventeen-fold by 2080, primarily due to increasing development on floodplains, changes in land use and water management. Only 10-30% of the expected increase in flooding is attributed to climate change, highlighting the significance of how humans manage their environment. Although traditional flood control infrastructures are a short-term solution, they can change river dynamics in the long-run, especially regarding sediment transport and coastal erosion. We present the global impacts of flooding and assess how traditional flood control technologies affect the environment compared to more sustainable solutions, considering both ecological and economic concerns. We compare case studies of different regions prone to flooding, focusing on the United States, the Netherlands and other parts of Europe. We evaluate the differences among approaches to flood control from these regions to determine what is most suitable for the given environment in terms of the long-term behavior of the river. We suggest proposals for reducing flood risk while limiting the impacts on the river system to promote its steady-state equilibrium and capacity to attenuate flooding. With this study, we hope to shift the public perception of water management away from hard engineering practices towards more ecologically based and sustainable methods.

*Keywords:* flood control, watershed management, coastal erosion, levees

**Health, Environment & Education, 2018**

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Poster

# Birds, Bats and Wind turbines

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## ABSTRACT

Wind turbines or rather wind parks have a significant impact on the resident bird and bat populations. We want to discuss how wind turbines influence those populations, and for the sake of our ecosystems, what our possibilities are to counteract the occurring problems.

Wind turbines are an important acquisition in the field of renewable energies. Today, there are about 30.000 wind turbines in Germany.<sup>1</sup> To achieve our goals in climate protection, we need to build many more in the next years. However, since about 30 years it is known that birds and bats are killed or heavily injured due to collision with the rotor blades<sup>2</sup>. This is a central area of conflict between the expansion of wind energy utilizations and nature conservation. Both, birds and bats have the right to legal protection. That is why collisions are an important aspect of species protection law in the licensing procedure<sup>3</sup>. Furthermore, some sensitive bird and bat species, for example some predatory birds, feel disturbed and are expelled from the area of the wind parks<sup>4</sup>. Hereby those species lose a habitat and breeding grounds<sup>5</sup>. Is it not possible to match electricity generation by wind parks and the protection of birds and bats?

Some research groups already dealt with this topic. It appears, that the red light of the facilities irritates or even attracts one species of bats. A change of those lights could reduce the number of killed or injured animals from this species. Protection zones are another possibility regarding the breeding grounds and flying routes of birds and bats<sup>6</sup>. The number would also decline if the wind turbines stay still on the days when flocks are passing. A further solution could be technical systems which detect and deflect birds.<sup>7</sup> The aim is to find different possible solutions to combine bird and bat protection with wind turbines.

*Keywords:* nature conservation, wind turbines, collision

**Health, Environment & Education, 2018**

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1 [statista.com/statistik/daten/studie/20116/umfrage/anzahl-der-windkraftanlagen-in-deutschland-seit-1993/](https://www.statista.com/statistik/daten/studie/20116/umfrage/anzahl-der-windkraftanlagen-in-deutschland-seit-1993/)

2 Journal of Applied Ecology (2004) Vol. 41, S. 72– 81

3 <https://bioconsult-sh.de/de/projekte/progress/>

4 Thaker, Zambre & Bhosale: Wind farms have cascading impacts on ecosystems across trophic levels. In: nature, ecology & evolution.

5 Wilson Bulletin (1999) Vol.111, Nr. 1, S.100-104

6 Journal of Applied Ecology (2004) Vol. 41, S. 72– 81

7 <https://www.daserste.de/information/wissen-kultur/w-wie-wissen/Windkraft-Gefahr-fuer-Voegel-100.html>

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Poster

# Less Meat – Less Heat!?

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## ABSTRACT

Climate change, which is considered a crucial public health threat, is significantly affected by the production as well as consumption of our meals. Being produced, harvested, transported and finally consumed, food is a major contributor to the greenhouse gas (GHG) emissions. In fact, different food items generate varying amounts of greenhouse gases in their production. Therefore, dietary choices can help mitigating climate change. This presentation thus highlights the relevance of the choices and amount of food being eaten to our climate and discusses further whether a diet change can have a positive impact on global warming.

In particular, the production of meat is closely linked to the increase of greenhouse gases in the atmosphere. Studies<sup>i</sup> have shown that it generates far more emissions than growing plants. In this context, 70 % of the GHG emissions caused by food consumption are the result of livestock products, whereas plant-based products merely occupy a third of them. Nevertheless, few researchers have addressed the problem of plant cultivation, such as quinoa or rice, which also accelerate global warming. Due to rising temperatures and extra carbon dioxide in the air, rice paddies release more of the GHG methane for each kilogram of rice being produced<sup>ii</sup>. Moreover, studies<sup>iii</sup> claim that quinoa, which is considered a popular “superfood”, is not as environmentally friendly as it seems. Because of intensive cultivation methods, quinoa fields transform into deserts and make the soils lose their fertility. In light of climate change, it is therefore important to increase the awareness of the influence our eating habits have on it. Reducing meat in our diets is indeed a huge step towards the reduction of heat, however, a better environment requires a balanced diet, including a healthy amount of meat, vegetables and fruits.

<sup>i</sup> Steffen Noleppa/agripol GbR. (2012). Climate Change On Your Plate. Berlin: WWF Germany.

<sup>ii</sup> Trinity College Dublin. (2012). Rice agriculture accelerates global warming: More greenhouse gas per grain of rice. ScienceDaily. Retrieved November 12, 2018 from [www.sciencedaily.com/releases/2012/10/121021154455.html](http://www.sciencedaily.com/releases/2012/10/121021154455.html)

<sup>iii</sup> IAEA Office of Public Information and Communication. (2015). Climate Change Adaptation: Boosting Quinoa Production Using Nuclear Techniques. Retrieved November 12, 2018 from <https://www.iaea.org/newscenter/news/climate-change-adaptation-boosting-quinoa-production-using-nuclear-techniques>

*Keywords:* climate change, food consumption, reduction

**Health, Environment & Education, 2018**

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Poster

# Dieseldgate: Timeline and Impact

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## ABSTRACT

The emissions scandal, or dieseldgate, was first uncovered over three years ago, in 2015. As of November 2018, court proceedings continue across the world and in recent months further fines have been brought against automobile manufacturers. Nearly all the major manufacturers in Germany have been implicated in this scandal, beginning with Volkswagen (VW) when evidence of the use of defeat devices was published in 2015. The discovery of VW's defeat devices began with a series of tests by a university research center and it has led to countless legal actions, numerous fines totaling more than \$ 2,000,000,000 and a succession of replacements of mid- and top tier management personnel. Here, we discuss the most important chemical and technical processes that lie behind the manipulation of emissions in diesel engines and aim to provide a framework for understanding the significance of the emissions scandal, what role technologies have played and the effect these chemicals can have on humans and the environment. Moreover, the political assessments, actions and consequences of the scandal are also analysed. Dieseldgate is an extremely important case of reference which highlights the relationships between politics, the environment and business and the ways these forces interact to shape the discourse of environmental politics. Simultaneously, it is a multifaceted subject which extends further into discussions of environmental law, economics, medicine or chemistry, along with many more. We have chosen a narrative structure in an attempt to condense this scandal for basic educational purposes while providing enough information to give a broad understanding of it. It was also decided to approach this subject through the lens of political science in order to allow for several disciplines and approaches to be considered and because many of the most important decisions being made with regards to the scandal are political in nature.

*Keywords:*

**Health, Environment & Education, 2018**

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