



CONGRESS PROCEEDINGS

CRACKS IN THE CONCRETE JUNGLE

5th International Urban Ecology Congress
October 22-24th, 2010, Berlin

Cracks in the Concrete Jungle: New Perspectives on Urban Ecology

October 22-24th, 2010, Berlin

Conference Proceedings



Graduate Research Training Group 780/III „Perspectives on Urban Ecology“

Optimizing Urban Nature Development –
Nature Functions and Living Environment
of City Inhabitants in Dynamic Change

The DFG Graduate Research Training Group 780 presents

Cracks in the Concrete Jungle

New Perspectives on Urban Ecology

October 22-24th, 2010, Berlin

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Dear congress participants!

To avoid unnecessary waste we decided to forgo obligatory materials and adjuncts like bags, ballpoint pens, notepads and advertising materials. In case you need such office materials please don't hesitate to contact us.

This conference is supported by the Deutsche Forschungsgemeinschaft
and sponsored by Berliner Pilsner.



Preface

Greeting and opening statements from the graduate program chair, Prof. Dr. Wilfried Endlicher

Dear congress guests, members of the graduate research group, supporting faculty, and grant holders,

It is an honor to open the 5th international urban ecology congress, "Cracks in the Concrete Jungle," and a pleasure to be here with you today to discuss new perspectives of urban ecology.

We are pleased to welcome representatives from different disciplines and different parts of the world. We received contributions from more than 20 different countries and five continents, which is already a great success for this congress and a very promising context for the next days.

Worldwide, contemporary urban societies are faced with drastic consequences of climate change, demographic shifts and associated economic disparity. What do such challenges mean for the natural environments of cities and for billions of urban inhabitants? Multidisciplinary solutions are necessary to develop new perspectives and creative strategies for sustainable urban development.

In 2002, three Berlin universities and two non-university research institutes launched the joint Research Training Group on Urban Ecology. The project was divided into three

research phases with the aim of investigating the dynamic interfaces between cities, nature and people over a period of nine years. Nine key members of the graduate research group are supported by a group of associated scientists. Key faculty and associated scientists contribute to the scientific knowledge and administration of the project. At present, they supervise doctoral candidates in 16 subprojects that cover a wide range of urban ecology issues.

The aim of the third and last research phase is to develop innovative strategies for a better understanding and development of urban nature and its functions. This phase may be differentiated from the former two, in that there is a special focus on the quality of life for city dwellers. Scenarios take into account the profound changes of climate, demographic and economic developments and associated consequences for nature and environment in metropolitan areas. Several test sites at three different scales have been selected for joint research. These include a microscale of test plots, mesoscale of surrounding quarters and macroscale of greater Berlin, as well as national and international sites of comparison.

The fifth and final congress “cracks in the concrete jungle” represents an important last step in our approach towards an open interdisciplinary discourse.

For this occasion, we have chosen a particularly suitable location – the science, technology and media-park Berlin-Adlershof. With more than 800 companies, 11 non-university research institutes and the sciences campus of the Humboldt University,

Adlershof is one of the 15 largest science and technology parks worldwide. Adlershof represents new scientific impulses as well as a new center for urban ecology.

At this point I would like to thank WISTA Management for accommodating us, and Berliner Kindle for sponsoring us. Very special thanks goes to the German Research Foundation for funding this event and for generously making our work possible over the last eight years. Thank you very much indeed to all the grant holders of the research group for their hard work organizing this congress. They are responsible for the very interesting program with top-class speakers. And last but not least I especially thank all of our guests for shaping the direction and content of this congress.

I wish all of us an exciting congress, inspiring discussions and lots of new perceptions on urban ecology.

Thank you very much and good luck!

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Introduction to Phase Three of the DFG-Graduate Research Program

DFG-Graduate Research Program “Perspectives on Urban Ecology III: Optimizing urban nature development: Dynamic change of nature functions and the urban environment of city dwellers”

The first phase of the Graduate Research Program, from 2002 to 2005, focused on general “Perspectives on Urban Ecology” in the city of Berlin. This was followed by the second phase from 2005 to 2008, which focused on the phenomena of “Shrinking Cities.” The aim of the third and final phase, from 2008 to 2011, is to develop and evaluate choices of action for urban ecology and its functions concerning the quality of life for city residents. Interdisciplinary clusters have been established focusing on the four main sections described below.

Cluster 1 – Optimizing ecological functions and biodiversity of urban roadsides

Although green spaces adjacent to roads are subject to a multitude of disturbances, they still offer potential habitat for highly adapted flora and fauna. Key research questions of this cluster address the role of road adjoining habitats as spaces for animals and plants to live, and the effects of ecotoxicological burdens on them.

Cluster 2 – Reuse of former housing estates and urban brownfields

Due to shrinking processes, large infrastructure and settlement areas in housing estates are left abandoned. With the goal of a future development of such areas, this cluster involves sub-projects that emphasize socioeconomic, planning-related, vegetation ecology, and environmental psychology research, investigating the potential for these areas to enhance biodiversity as well as quality of life of city dwellers.

Cluster 3 – Strategies for temporarily used urban sites

Temporarily used urban sites which are a sign of social and economic restructuring processes are increasingly used as a flexible instrument within the field of urban planning. At the same time, the aim of sustainable urban development is being realized with long-term instruments. Investigations within this research cluster include the influence of spatial planning, events, land and real estate market, and the process of shaping public opinion within civil societies on sustainable and ecological orientated urban development.

Cluster 4 – Psychological health and mental state of urban dwellers

Dynamic and short-term changes are characteristic for urban ecosystems. It is of great interest whether and how the modification of certain objective conditions is reflected in subjective perceptions and valuations. Furthermore, this cluster will investigate how perception and valuation processes reflect on specific actions and mental health of city dwellers.

Speaker Abstracts

Sustainable Planning and Policy

What alternative and creative planning tools and management approaches exist in the fields of law, governance, architecture, and urban planning? The following contributions consider the handling and response of planning and policy to specific urban, social or ecological phenomena.

Urban soil sealing – Key indicator for urban ecological functionality and ecological planning

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Cities and towns are characterized by sealed surfaces of different types and structures (buildings, pavements etc.). Urban soil sealing is one of the main drivers of urban ecological functions and ecosystem services (climate, water balance, soil functionality, biodiversity etc.). There is not much knowledge available to quantify these functions depending and steered by soil sealing in cities. Soil sealing is everywhere growing in cities and sealed surfaces grow faster than the city itself (population, economy etc.). Urban soil sealing has been identified as key indicator for de-naturalization and destruction of urban ecosystem services – without many consequences. Urban Planning and policy is still not sufficiently able to reduce the fast urban soil sealing growth. This subject is an example area how urban planning is dealing with the subject to recognize it, to monitor and to avoid it. Actual and potential planning instruments to reduce soil sealing and its growth rates are proved.

Beside theoretically approaches and evaluation of existing studies practical investigations of case studies in Germany and Austria will be presented. Soil sealing in urban ecosystems

will be investigated on different levels (whole city, districts and sites) to identify the indicator quality for ecological functions. In Germany existing planning instruments will be proved for there ability to avoid soil sealing. New economic steering instruments will be proposed. The specific planning instruments can be proved under different regional and local conditions. This links to a better understanding of urban ecosystems, its planning and management.

Adaptation to climate change by urban green systems in relation to urban brownfield renaturation

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Urban development has to face the challenge of establishing adaptation strategies to climate change. Green infrastructure is assigned a crucial role in these adaptation strategies by their potential to regulate the urban climate and to offer cooler places in the dense and hot city. So, urban green spaces have direct influences to the quality of life and the health of urban population. Not to forget, urban green spaces may also be a part of urban mitigation strategies: urban vegetation also has functions as a carbon sink. Shadow provided by urban trees may also reduce the effort of energy for air conditioning.

Processes of economic and demographic change lead to urban transformation, which has impacts to the spatial structure and physical form of our cities. Brownfields resulting from the abandonment of former industrial use, the deconstruction of buildings and the increase in vacant buildings and lots in shrinking cities as well as land use change by concurrent suburbanisation determine the spatial structure in cities.

The conservation of spontaneous vegetation and the greening of brownfields include potentials to develop urban green systems, which provide climate regulatory effects, and not

least manifold other ecological, social and aesthetic benefits.

The presentation focuses on the questions: Which potentials and constraints for adaptation to climate change by the development of green spaces are provided in terms of spatial and physical transformation of cities and how positive effects can be supported by urban and green space planning strategies.

Infrastructure as a medium for democracy and architecture

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Keywords: Porosity, Network, Infrastructure, Vinex, North Milan, Territory, Project

Urban “porosity” is one of the main objectives of the sustainable urban development. Following a “network” system which connects the built and open spaces, as well as the natural environment, is a way to achieve this goal. One of the urban materials capable of generating network is mobility infrastructure. Present work aims to investigate its role in contemporary territories, through the study of recent Dutch experiences on one side and the actual situation in the metropolitan area of North Milan on the other.

Dutch territory has been traditionally characterized by a strong infrastructural network. Recently, the role of the infrastructure has been emphasized also by urban policies, in particular by Vinex program. Vinex has used infrastructural design to build consensus and environmental equilibrium, for example, in the project of Leidsche Rijn. Nevertheless, this policy has led to a territory characterized by a strong division of functions. On the contrary, a mixed land use is the distinctive feature of North Milan. This region has a density of built/unbuilt spaces similar to Dutch territory, but unlike

it, mobility infrastructures do not constitute here a network system. In this case, important North/South connections separate the territory into long strips, making difficult any east/west movement.

In conclusion, the study points out that mobility infrastructure is a critical point of sustainable urban development, as it is capable of connecting and dividing at the same time. Hence, a good infrastructural design is a fundamental planning tool to interpret and solve urban, social and ecological phenomena.



Metropolitan area of North Milan. The image shows the territory divided into different strips by the principal infrastructures.

“Bike every day, celebrate it once a month.” Critical Mass, sustainable urban mobility, and social articulations

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Keywords: Sustainable mobility, biking, urban movements

Our research is focused on the city of Madrid, one of the Spanish cities where Critical Mass of bikers is the best known and the most crowded. We have found, first, that the success of this movement is based on the “party & protest” and “do it yourself”-like paradigm. That is to say, every meeting gathers a wide diverse range of people who daily use bicycle and now have a regular date where to interact, have fun, reshape their meanings about urban space, and manifest their demands for a more bicycle-friendly city. Secondly, this is a direct challenge to the public policies which have not modified the dominant model of motorized urban mobility. Finally, the monthly encounter is very close linked to an internet network of fluent communication and a spatial network of “workshops” located in squatted and self-managed social centres. We shall argue, then, that initiatives such the Critical Mass get their optimum potential as an articulation with other sustainable experiences in the urban structure (housing and buildings) and with “autonomous” social networks promoting mutual ways of living, exchange and creation of collective knowledge.

Environmental organisations: towards integrative strategies?

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Keywords: city-nature relations, environmental groups, sustainable projects

Cities are not a usual focal point for environmental groups. However, in the last few years and in different national contexts, these groups seem to be including the built environment in their objectives and activities. Pro Natura in Switzerland, the Campaign to protect rural England in the UK or the World Wide Fund for nature are good examples of this new approach. The latter is, for instance, increasingly involved in sustainable neighborhood projects. In the following, we will present the main results of a research project dealing with the urban strategies of environmental organisations.

Firstly, those urban strategies can be seen as an attempt to respond to the challenges of urban development and ecological problems by implementing “integrative strategies” that concern both the built and the non-built environment. In this new perspective urban development and nature protection are deeply interrelated. Secondly, these integrative strategies also reveal changes in the way these organisations conceive city-nature relations. Traditionally, cities were seen as a threat to nature. This antagonistic vision tends to turn into a

dialectic one because it appears that nature can be imbedded in the urban realm and contribute to city liveability.

However, this new trend is not developing without tensions. Anti-urban representations have not disappeared. Rather, they are constantly re-articulated by environmental groups, especially when it comes to defining the type of nature they would like to protect.

Planning Through Images: Influences of Contemporary Design Practice on Chinese Environmentalism

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Keywords: China, Sustainability, Visual Representation, Design Practice



Artist's impression of Dongtan Eco-City, Shanghai. Designed by Arup, it intended to become the first eco-city. Copyrights: Arup

Talking and writing about sustainability is common in today's China - possibly its acceptance has its origins in Premier Jintao's ideology of the „Harmonious Society“. Both the political discourses and the media are instrumental in disseminating - in written and spoken manner - a sensitive view on the environment. However, the communication of green urban proposals focuses on the propagation of images produced by architects rather than words. Even in the Chinese authoritarian context, the communication of urban ideas undoubtedly responds to a visual tradition deeply incorporated into the society.

This paper explores how sustainability and climate change influence planning and local political agendas through the creation of a “sustainable” image. Arguably the visual production associated to green projects such as eco-cities has significantly influenced local politics through the generation of hyperrealist images of a green future. In this context, the analysis of imagery in projects such as Dongtan Eco-city and preceding urban projects used in political posters – e.g. Hong-Kong’s skyline and Shanghai’s Lujiazui - open opportunities to comprehend how the use of images support or perhaps modify the local political processes. Methodologically, this paper will review the current visual production associated to sustainable projects as well as sequential samples of older references such as propaganda posters and recent visualisations of Chinese cities. This analysis will provide empirical evidence on how the representation of cities can be seen as a spatial practice that has evolved along Chinese politics and has become highly influential, especially in regards to the communication of environmental practices.

Urban Biodiversity

Worldwide, populations boom and blossom into mega-cities. In Germany, despite a steady decrease in population, more than 100 hectares are newly sealed for transport, housing and infrastructure each day. Because of spatial heterogeneity and a huge variety of environmental factors, cities are particularly species-rich habitats. Despite their status as “hotspots of biodiversity,” urban ecosystems also face urgent problems such as habitat fragmentation, pollution, and the dilemma of non-native species. This session examines the peculiarities of urban habitats and the response of animals and plants to anthropogenic processes and changing environmental conditions.

Investigating the Mechanisms that Change Bird Diversity along a Gradient of Urbanization

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Keywords: birds, biodiversity, community, population

The long-term study of animal populations along steep environmental gradients in dynamic settings enables one to determine the relative influence of density-dependent and density-independent factors in the regulation of populations and test a variety of theories concerning the assembly of communities. I begin this process by reporting on a 12-year-long study of breeding birds at 23 sites along a gradient of urbanization in the Seattle, WA metropolitan region that measures bird demography, and community assembly and composition with a before-after-control design to determine the relative importance of predation, competition, and facilitation to community composition and the importance of survivorship, reproduction, and stochasticity to population colonization and viability in an urban ecosystem. My students and I cannot yet rank factors in terms of their overall importance, but we do demonstrate that at the population level, size and survival are important key properties linked to viability, and at the community level food and predation are important drivers of diversity. I suggest that future research needs to understand the critical importance of facilitation within and subsidies from outside of the urban ecosystem.

Human-avian interactions in urban areas

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Keywords: human attitudes and behavior towards birds, bird behavior, crows



Hooded Crow (*Corvax cornix*) taking flight in Kreuzberg (Berlin, Germany).

Photo by Helena Frank

Contact between humans and other animals can create positive or negative outcomes and these interactions can be quite numerous in urban areas. In particular, many avian species appear to have adapted to living in cities among high densities of humans. Here we explore the relationship between humans and birds (corvids and small songbirds) in two urban areas: Berlin, Germany and Seattle, Washington, USA. We first surveyed residents' attitudes and actions

concerning birds and then tested bird behavior towards humans (flight distances and foraging behavior). In addition, our study sites covered an urbanization gradient (city center to outlying rural areas) in order to compare responses across human densities and habitat types.

We found that humans vary in their encouraging actions (e.g., feeding) depending on their age, if they rent or own their home, and where they live on the urbanization gradient. Encouragement of birds was higher in suburban and outlying areas compared to the city center in both Berlin and Seattle. Discouraging actions were not prevalent in Berlin, but were relatively high at rural sites in Seattle. We will present additional results of the human survey and differences between Seattle and Berlin and whether differing levels of encouraging or discouraging actions by humans had an effect on bird behavior. We will also discuss if cultural differences between the Berlin and Seattle influence interactions between humans and avian species.

Invasive plant species in city habitats of the Ruhrgebiet (Germany) – finding a niche?

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Keywords: alien invasive plant, neophyte, Ruhrgebiet, Germany, city area

Alien invasive plant species are often recognized as aggressive pests in natural and semi-natural ecosystems. In cities and postindustrial city areas, where threatened urbanophobic species of natural and semi-natural ecosystems are rare, such problematic cases seem to reach only low level. But what are the urban biotopes that are colonised by invasive species? A qualitative and distribution quantitative study of the invasive flora and its biotopes (habitats) were carried out in the former European largest urban-industrial agglomeration, the Ruhrgebiet (Ruhr area, Ruhr region).

In the city area of Kamen in the eastern border region of the Ruhrgebiet the distribution of the invasive neophytes were studied detailed by exact observation of the whole area over 25 years. An evaluation of data prove a high degree of invasive plant biotope diversity, but on the other hand only a restricted „typical“ urban biotope range for the most invasive alien species is given (except for the Caucasian Bramble *Rubus armeniacus* and the North American Goldenrod *Solidago serotinoidea*, which are omnipresent in the whole area and

nearly all biotope types). Invasive plant species which are seen as particularly problematic in nature conservation purposes, occupy the least hemerobic biotopes in the urban-industrial landscape and tend to reach adjacent rural and therefore partially more semi-natural areas by spreading from such habitats.

Changes in the functional composition of a Central European urban flora over three centuries

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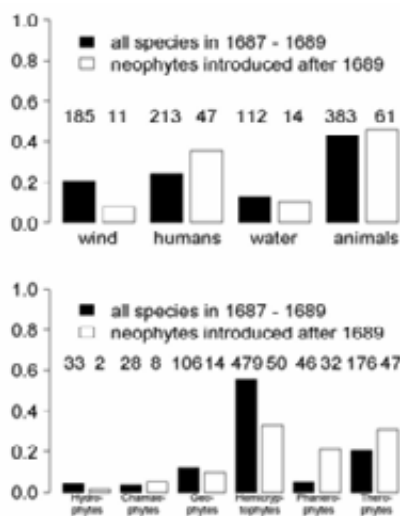
Keywords: Alien species, Historical dynamics, Life-history traits, Urban ecology

European urbanization developed over hundreds of years. It displaced agricultural, semi-natural and natural landscapes, and affected local and regional climate. These changes impacted on the flora: plant species suffering habitat destruction or species maladapted to the conditions created by urbanization decrease in frequency or became locally extinct; well-adapted species increased in frequency or newly entered the flora. Documents on historical floras provide unique opportunities to analyze past changes in biodiversity and to draw conclusions on future floristic changes.

We studied the historical and recent flora of the city of Halle in Central Germany. Our earliest records date back to the years 1687-1689; the youngest were sampled in 2008. More than 20 other floras provide information for the time in-between. We checked the historical data for plausibility, distinguished species native to Germany, archaeophytes, and neophytes, and assigned the species to several trait attributes. We tested

which trait attributes were associated with native species and archaeophytes extinct in the study period, or with neophytes that entered the flora in the study period. Time-series analysis showed trends in trait attribute frequency.

The functional changes we found relate to habitat destruction (e.g., decreases in helomorphic species), an increasing urban heat island effect (e.g., increases in lately flowering species), increasing human population density (e.g., increases in species dispersed by humans; Fig.), and urban landscape management (e.g., increases in tree and shrub species; Fig.). Our results indicate possible future developments of floras in urban and urbanizing regions and provide recommendations for nature conservation in urban areas.



Trait attribute frequency (dispersal, life form) in Halle's flora, 1687-1689, and of neophytes introduced 1689-2008 with underlying species numbers.

Citation: Knapp, S., Kühn, I., Stolle, J., Klotz, S. (2010): Changes in the functional composition of a Central European urban flora over three centuries. *Perspectives in Plant Ecology, Evolution and Systematics*, in press (doi:10.1016/j.ppees.2009.11.001).

The influence of corridor width and landscape characteristics on the biodiversity of urban riparian zones

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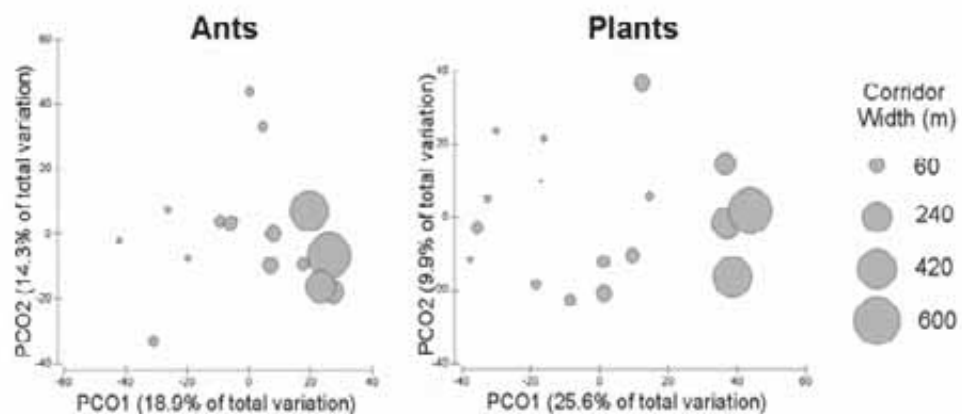
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Keywords: Riparian corridor width, Biodiversity, Species richness, Ants, Australia

Riparian corridors are commonly the last remaining areas of natural habitat within urban landscapes. With increasing development pressure legislated minimum riparian widths are increasingly being disputed, however little empirical evidence exists as to the efficacy of these policies for biodiversity conservation. In this study, we investigated the response of ant and vascular plant assemblages to riparian corridor width and a range of environmental descriptors of each site and its landscape context. Eighteen riparian corridors were selected from within the Ku-ring-gai Local Government Area, Sydney Australia. Ants were sampled using pitfall traps positioned within rectangular vegetation transects (30 m x 10 m). Both plant and ant species richness was uncorrelated with corridor width, however significant compositional differences were observed. With the inclusion of additional environmental predictors, multivariate modelling confirmed corridor width as a primary driver of riparian vegetation composition. However, ant assemblages were predicted more accurately by the degree of connectivity between bushland patches, the density of roads adjacent to the site, and the type of vegetation

community present. The dominance of opportunistic species contributed greatly to differences in ant assemblages while higher proportions of invasive plants were observed in narrow corridors. Our findings support consideration of setting minimum riparian widths in land use policy. However, recommending specific corridor dimensions for biodiversity conservation is difficult because of significant variability observed between sites. To enhance riparian biodiversity across all widths, environmental managers should seek to minimise the influence of catchment land use, and control invasive plants alongside urban streams.



Ordination (Principal coordinates analysis) of riparian ant and plant assemblages, demonstrating a change in composition with increasing width.

Environmental Media

This session is aimed at particular research theories and methods dealing with issues such as local climate, air quality, water regime, soil properties and bodies of water in urban settings. Contributions include interdisciplinary ecosystem research, investigations into ecological processes in cities, and climate change in the context of environmental media.

Urban Vegetation and Climate Change: Assessing Potentials and Uncertainties with numerical models

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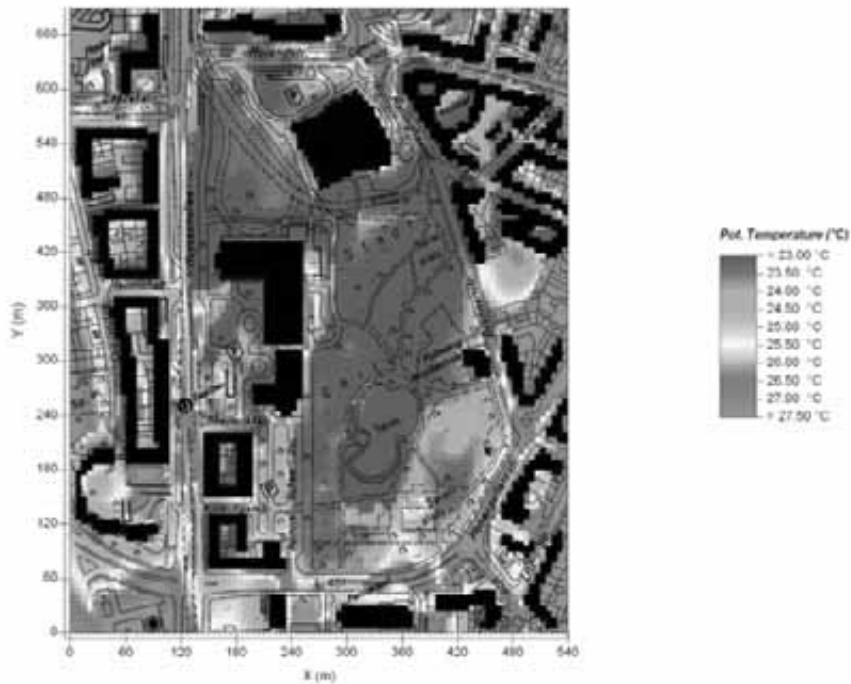
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Keywords: Urban microclimate, Urban Vegetation, Climate change

Urban green spaces and green street canyons are considered as one of the main tools to mitigate the negative heat stress impacts of global climate change on the urban neighbourhood scale. The potential benefits that can be obtained by greening our cities are very sensible to the specific local conditions such as spatial layout of the green spaces, building constellation or local atmospheric processes. Hence, numerical microscale modelling is the only way to understand the dynamics of yet non-existing urban green spaces and to optimize the planning design.

This talk will present the basic approaches to simulate the effects of urban green on local microclimate. A brief overview is given over the processes taking place between the surface, the plants and the air and which are the influencing parameters. In the second half of the presentation we will look at the impacts of long lasting heat wave events as one consequence of global climate change and the urban system. Can we expect that the environmental performance of the urban green systems under such extreme events will be the

same as in an ordinary urban summer? If not, are tools and practices used for designing green cities today also suitable to improve future urban summers with longer dry and hot spells?



Distribution of air temperature inside an urban park at 14:00 on an average summer day.

Citation: www.envi-met.com

Improving the air quality in our cities: are the measures effective?

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Keywords: urban air quality, emission reduction, low emission zone, PM10, NO2

High concentrations of air pollutants cause adverse health effects. Therefore, the EC air quality directives set limit values for various pollutants, such as PM10 and NO₂. The air quality in street canyons with high traffic densities is still far from meeting the limit values. Especially the annual average NO₂ concentrations frequently exceed the limit value of 40 µg/m³, e.g., 76 NO₂ exceedance cases in North Rhine-Westphalia in 2009. This poses a problem not only to German cities but also to cities all over Europe. One measure to reduce the pollution loads is the implementation of low emission zones (LEZ). In many parts of Europe LEZ have been implemented and their number has been growing over the last two years. Currently, most implementations focus on measures to reduce road traffic emissions in conurbations with the aim to improve air quality significantly. The measures comprise road traffic regulations, i. e. ban of vehicles that do not meet certain emission standards.

This paper reviews some of the German experience with LEZ (e.g., Berlin, Cologne, Düsseldorf, and the Ruhr Area) and the

NO₂ problem, including measurements and model studies. To quantify the reduction of concentration loads by LEZ with measurements is even more difficult than with modelling, as not only the LEZ leads to changes in pollution loads. The observed effects range from “no effect at all” (e. g., in Hannover) to “significant reduction” (e. g., in Berlin). Table 1 shows some of our findings for Cologne and for the Ruhr Area, both referring to busy street canyons. All observations and model studies have in common that only a negligible effect of LEZ on the PM₁₀ and NO₂ background concentrations were found.

Location	PM ₁₀ µg/m ³	NO ₂ µg/m ³
Cologne	~1	2
Ruhr Area	0,5 - 4	0,5 - 6

Table 1: Reduction of annual means for PM₁₀ and NO₂ by LEZ in Cologne (measurements) and the Ruhr Area (modelling).

On the spatial correlation between PM10 concentrations and social strata in an urban environmental zone – the example of Berlin

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Keywords: Particulate Matter concentrations, social strata, dual disadvantage

Particulate Matter (PM) have the potential to cause severe health risks as e.g. cardiorespiratory diseases and a shortening of life expectancy.

In an interdisciplinary study we investigated the spatial correlation between PM10 concentrations and the social structure in the city of Berlin, Germany. We found out that (1) the highest PM10-loads occur within the environmental zone, i.e. in the area enclosed by the circle line of the rapid transit system. Taking into consideration the population figures within the environmental zone, about 75% of the inhabitants of the environmental zone, and thus more than 20 % of the population of Berlin are exposed to high PM10-loads. (2) By overlaying the PM10-loads with social status and dynamic data of the people living within the environmental zone, we determined that a large share of population within the environmental zone is disadvantaged twice: especially socially deprived people are endangered by high to very high PM10-concentrations. As a consequence, the hypothesis stated at the beginning of our investigation could be verified:

areas with a (very) low social status – respectively with a high share of socially vulnerable groups - concurrently show (very) high PM10-loads.

In the presentation, the methodology and most important results of the study will be presented. Further consequences of the results will be discussed against the background of the concept of 'environmental justice' and potential measures to achieve a reduction of PM10 loads within the environmental zone thus improving the liveability and functionality of human urban habitats.

Citation: Kindler, A.; Weiland, U.; Metto, J.; Franck, U. (2009): Untersuchung zur räumlichen Korrelation von Feinstaub (PM10)-Belastungen und Sozialstatus/ Dynamik-Index in den Berliner Verkehrszellen. UFZ-Bericht 03/2009. Leipzig.

Trees in the concrete jungle: Spatial and temporal patterns of tree crown temperature in an urban environment

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Keywords: urban tree temperature spatial temporal pattern

The importance of trees for the urban environment was already emphasised within urban climate studies. This includes the reduction of air temperature by evaporation, the reduction of surface temperature by shadowing and the improving of air quality by dust filtering. In addition, tree shadow has an effect on human thermal comfort because of modified incoming solar and thermal radiation part of the human energy balance. However, there are only few studies regarding the spatial and temporal variability of tree crown temperatures, which has important consequences for the tree itself, but also for the urban environment surrounding the tree.

This research analyses surface temperature of tree crowns using a high-resolution thermal-infrared (TIR) camera and meteorological measurements in the city of Berlin, Germany. For temporal analysis, the TIR camera recorded one thermal image per minute over a period of five days from 5th to 10th August 2009 and for spatial analysis, we selected 108 trees with dense crowns. The daily mean crown temperature ranged from 23.5 °C to 24.7 °C. The maximum range was recorded around 14:00 CET and amounts up to 3.3 K.

The results show that crown temperature depends on the tree species, location within the city and its canopy architecture. *Populus nigra* showed the lowest daytime temperature in the investigated area. All trees over sealed surfaces, most notable in the day pattern, showed higher temperatures in comparison to park trees. Only very high crowns that overlap the street canyon or courtyard were slightly cooler.



Fig. 1: Daily mean pattern of surface temperature (left) and corresponding photograph of the study site.

Increasing urban evaporation rates

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Keywords: urban water balance, porous concrete, evaporation



Test field near Muenster for evaporation measurements on different (waterpermeable) pavement systems.

Sealed surfaces in urban areas are one reason for a disturbed water balance and the urban heat-island effect. Here infiltration as well as evaporation rates of precipitation water, are decreased. This leads to low groundwater recharge rates, high surface runoff rates and a reduced conversion of solar energy. The result is an intensified flood risk and an uncomfortable city climate.

One solution is the use of water-permeable pavements. The infiltration rate is increased and, as actual measurements

show, the evaporation is also about 19% higher than on impermeable pavements. This is a first attenuation to natural climatic and hydrological conditions.

In an on-going research project at the University of Muenster, the evaporation rates of water-permeable pavement systems will be optimized. By the use of a new actual evaporation measurement device (Tunnel-evaporation gauge) several pavement systems have already been measured in a test field. As a result, the influence of deeper street layers on evaporation can be nearly excluded.

In spite of this, the influence of the paving stone material, and the seam filling, is expected to be large. By changing the paving stone colour, 16% higher evaporation rates were measured. Furthermore, newly developed paving stone prototypes are under test in the laboratory and in the field. With the results of these on-going measurements, it will be possible to develop street surfaces that can achieve a near-natural water balance. The higher evaporation will also lead to increased energy conversion and urban heat-island effects could be eased. With it, the climate quality in cities will be improved.

Theories, Methods and Practice

This session focuses on theoretical and methodological approaches to human-environment relationships. Contributions come from diverse fields such as landscape architecture, open space planning, remote sensing, and geomatics with urban ecological relevance.

'Urban nature' or what planners think people should like, understand or at least shrug off

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Keywords: aesthetics, urban nature, planning theory, perception

Planning ideologies do not fit automatically to laymen's expectations. This is especially the case, when planners follow primarily their own professional aspirations and discussions or some economical or ecological necessities instead of reacting to public expectations. In such cases (and the concept of 'urban nature' is one of them) experts normally reclaim to have the better knowledge, the better taste and much more the common interest in mind than laymen.

Nevertheless to some extent they and their proposals depend on public acclamation. At least people should shrug it off because their interests are not touched. It is much better when they understand it as a good thing, although perhaps they personally don't like it or benefit. Obviously the best way is that people like it because it is beneficial to them in one way or the other.

The argument is that the concept of 'urban nature' could work on all three levels: it can be implemented just 'pleasantly' enough to be accepted and liked by the people, it makes enough sense on the individual and local level and it is not

so relevant or at least 'avoidable' enough not to produce too much public awareness or conflict. It shows that the concept of 'urban nature', which appeared in the 1980ies as a rather radical and one-dimensional ideology has learned to be incremental and adaptive enough to gain public approval or at least toleration. Above all it now combines ecological, economical, social and aesthetical benefits.

The steps to a new urbanism paradigm

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The sustainable development calls for a strong reinforcement of the environmental understanding of urban life especially in the awaited objective of its quality. The stakes are at the same time a reduction of the harmful effects caused by man and an increase of the ecosystemic services one might expect of nature. The fast development of the concept of “green frame” as a new tool for cities is one of the best illustrations but requires both more assessment and more research, in life and human sciences. After the steps of ecological management of parks and of biodiversity assessment in various urban spaces, the step of ecological corridors within town leads to a new approach of landscape planning. Today the new challenge appears to have to integrate architectural AND natural processes simultaneously to define the new landscape of the town of the future.

Unexpected Dynamics: the Diversification of Urban Open Space

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The current urban development and the transformation of the cities broaden the spectrum of urban open spaces. The mechanisms of urban space production are changing; new actors, new design visions, and use mixes are emerging and add new facets to the culture of urban open space. They become a component in creative urban development that focuses attention even on small-scale changes and on unusual approaches. New circles of actors and alliances are arising to exploit the potential of transformation processes, expanding the traditional repertoire of urban open space culture in interesting directions.

Many of these approaches are in the nature of projects. Current urban development and redevelopment requires not only experimentation with new practices and new design on the micro-scale but also demands macro-scale-concepts for urban landscapes. Among the proposals under discussion are urban agriculture and forestry. Who is in charge of these urban landscapes and how do they look like? Forest and forestry are emerging as models for landscape design and management that can satisfy the wide range of current needs in a flexible

manner. Similar requirements are associated with concepts of urban agriculture and urban food production. The scope for development varies strongly from place to place, dependent as it is on local conditions, on the given context, and on the “biography” of the city concerned. Perhaps it is this very “heterogeneous complexity” – spatial, structural, social and cultural – that provides a common denominator for urban open spaces that are coming into being through the post-industrial transformation of cities.

URBAN ECOLOGIES - towards a performative urbanism

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Keywords: performative urbanism, bionic corridors, parametric design

The Urban Ecologies project is a research project, sponsored by the French Ministry of Culture and Communication, the Ministry of Ecology, Energy, Sustainable Development and Town and Country Planning as well as the Ministry of Housing and Urban Affairs. Given the environmental crisis and the effects of globalisation, architecture is confronted with the question of how to reconcile humanity with its cultural, social and environmental milieus by establishing strategies of transformation and regeneration, that do not put nature and technology in opposition to each other but rather look for a way to unify the two. The comprehension of ecosystems requires an adequate architectural advance that operatively involves biology to approach problems and to evaluate solutions.

The trans-disciplinary research team develops research by design towards the definition of an innovative *modus operandi* synthesized as Urban Ecologies (UE). The objective of this research is to develop a flexible model of urbanization through a holistic approach in order to: [i] reduce the environmental impact implicit in urban developments, [ii] integrate natural

and urban dynamics, [iii] and maximize the transformation of polluting agents into new resources and energies. EU land management proceeds by indexing and valorising natural oases while considering demand for urban growth.

Yet, the problem of interconnecting these oases in order to enhance their biodiversity is becoming increasingly evident: ecology has clearly shown how networks of biotic corridors - natural infrastructures enabling exchange between different biotopes - play a crucial role in the functioning of the overall eco-system. As fast processes of urbanisation have weakened or severed most biotic corridors, this research moves from the assumption that programs for the regeneration of existing biotic corridors should be accompanied by inclusive forms of sustainable urbanisation.

Empirical Study on China's Major Function Zoning from the Perspective of Ecological Economics: Case study on Beijing-Tianjin Metropolitan Area

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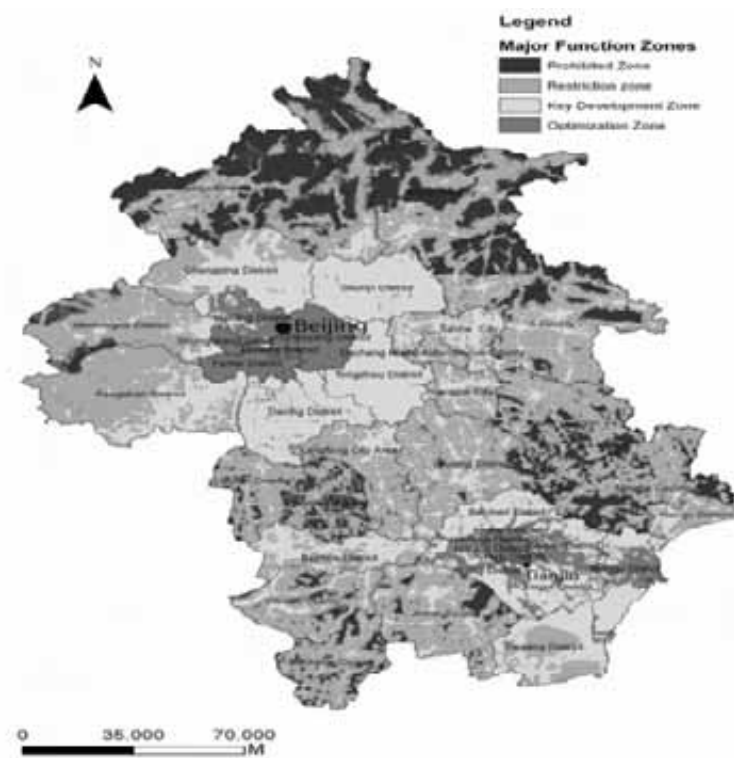
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Keywords: Major Function Zoning, Ecological Economics, Regional Development

This presentation addresses the project complemented in 2009 on current China's new spatial planning, Major Function Zoning (MFZ). Quantitative assessment of regions' development potential and function has been one of the main barriers in the operation of MFZ in China. This study attempts to explore a quantitative approach of MFZ based on aspects of ecological economics. Those assert that a comprehensive analysis of regional integrated ecosystems can help identification of Major Function Zones. A "Development Degree Model" has been set up to classify the regional development factors as a Potential-factor and a Constraint-factor.

This model was applied to the case of Beijing Tianjin metropolitan area. A comprehensive analysis of Regional Integrated Ecosystem was applied which is composed of analyses of ecological sensitivity, environmental stress, potential of socio-economic development and natural resources. Finally the study area was divided into four Major

Function Zones. The result shows a Optimization Zone located mainly in the central area of Beijing and Tianjin cites, the Key Development Zone is distributed around the former Optimization Zones with a structure of rings and corridors, Restriction zones and Prohibited Zones are situated at the Northern part, the Southwest part of Beijing, the Northeast part and the Southwest part of Tianjin. According to the plan, the corresponding regional policies and evaluation systems of local governmental performance will be implemented in the above four Major Function Zones respectively.



Major function zones of Beijing-Tianjin metropolitan area

A Comparative Study of Wind Energy Usage in Architecture: Learning from Traditional Architecture in Iran

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Keywords: wind energy, traditional architecture, contemporary architecture

This paper seeks to investigate the role of wind turbines in contemporary architecture and how to make them structurally and functionally compatible with urban architectural elements. Utilization of wind energy in buildings presents an exciting challenge for designers and engineers which is reflected by different approaches. This paper investigates approaches of Iran and other Middle Eastern countries which involve the use of traditional wind catchers as an historic and vernacular architectural innovation. It also studies the compatibility of this technology with architecture and regional urban design. The goal is to generate guidelines and tools for applications of modern architecture derived by historical studies. A lack of structural and functional compatibility with other architectural elements is one of the main reasons why wind energy has not been applied to urban life. A benefit of such architecture is the harmonic integration and compatibility within the existing surrounding. Examples on design scenarios, relevant sketches are represented based on aforementioned evaluations. Proposals on design studies

are evaluated based on visual impact, safety, noise emission and orientation of architecture. Devising technologies address the needs of our time, and support guidelines to be used in modern architecture.



picture 1 to 5: wind catcher integrated within traditional architecture; urban design of Iran

picture 6 to 9: wind catcher integrated within contemporary architecture

Perception and Behavior

The interaction between humans and nature in urban environments is the topic of this session. Included, for example, are the effects of environmental conditions on urban lifestyle, human well-being, and behavior. Further discussion topics include anthropogenic solutions to environmental problems, such as adaptation to climate change, environmental education, or creative uses of temporary green space.

Green environments as key components of a healthy human habitat

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Just as *Homo sapiens* becomes a predominately urban species and increasingly loses contact with the natural world, scientists have discovered how crucial a role green environments play in a healthy human habitat. Forests, parks, small patches of nature in the urban jungle, even interior spaces with views of greenery, far from being merely pleasant changes from our largely indoor, artificial settings, may be as fundamental infrastructure for human habitation as streets, sewers, and electricity.

Ethology, as well as experience with zoo and laboratory animals, tells us that organisms housed in unfit habitats undergo social, psychological and physical breakdown. Converging evidence from scientists worldwide is revealing parallel patterns of social, psychological, and physical dysfunction in humans relatively deprived of contact with green environments. "Nature deprivation disorder" encompasses as wide-ranging outcomes as increased aggression and violence, lowered resilience and capacity for psychological homeostasis, poorer immune functioning, numerous physician-diagnosed disease clusters, and mortality.

Bridging the gap between red and green? How to get architects, project developers and entrepreneurs involved in urban biodiversity conservation

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Keywords: urban development, architecture, urban professional, biodiversity



The Medina housing project: a successful example of integrating biodiversity green in an apartment complex in the Eindhoven city center (Soontiëns Green Managers).

Currently, the main actors in urban biodiversity conservation are municipal ecologists, environmental NGOs and interested citizens. However, those who shape and run cities (being urban professionals like architects, project developers and other economic parties) generally lack any interest in this topic.

The presenter of this talk, Robbert Snep is an applied researcher and consultant in urban ecology for more than 12 years. Based on his experience he will discuss some do's

and don'ts in getting these urban professionals successfully involved in urban biodiversity conservation. What is the perception of these 'red' actors on the 'green' topic of urban biodiversity and how to cooperate with them in a positive way?

In his talk he will illustrate his ideas addressing these issues:

(1) Biodiversity conservation at business sites.

In a PhD-study on this topic Snep discussed the combination of ecology and economy with entrepreneurs, project developers and municipal economic departments. Their perceptions on wildlife and urban green show a substantial potential for biodiversity conservation, if dealt with in the right way (Snep et al. 2009).

(2) Biodiversity conservation in sustainable urban development

As ecological expert Snep was involved in a range of actual building projects on sustainable housing projects and green hospitals. Here, biodiversity conservation is considered a rather new branch in the field of sustainable urban development. It therefore takes some effort to match ecology with the conventional aspects of sustainable development that are more technical-orientated.

Citation: Snep RPH, Van Ierland EC, Opdam P (2009).

Enhancing biodiversity at business sites: What are the options, and which of these do stakeholders prefer? *Landscape and Urban Planning* 91: 26-35.

Some like it hot? - Integrating measurements of land surface and air temperature with self-reported wellbeing

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Keywords: Urban climate, human health, Leipzig, urban heat island, perception

Urban conditions have a strong influence on human wellbeing and health. Analysing the urban climate will gain even more importance because of global change and increasing heat-related events, ongoing urbanisation and demographic change leading to a growing share of elderly population. Only little is known about how heat stress is perceived by different social groups and how this relates to the urban setting.

Set against this background, we present first results of an analysis of the urban climate in the city of Leipzig, Germany. Our starting points are two thermal images of land surface temperatures that will be obtained by an airborne sensor in summer 2010. These thermal images map land surface temperatures in one night, after sunset and before sunrise. They are commissioned by the city of Leipzig.

The approach relates to three scales: (1) Those urban districts with high surface temperatures and a high share of vulnerable population groups are identified using statistical data and the fine-grained land surface temperatures. (2) The relationship of land surface temperature and corresponding air temperature

over various urban structural types is analysed statistically.

(3) The objective heat stress (measured air temperatures in the flat or house) is linked to subjective perceptions using a written questionnaire that refers to the night of temperature measurement. The three scales are integrated by relating respondents' residences to (a) urban districts and (b) their urban structural type. We will conclude our presentation with some methodological remarks on the integration of the different scales in this study.

The Concrete pieces that Crack faster: vulnerable groups and environmental behaviours

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Keywords: youth, disadvantaged neighbourhood, active reaction

In post-socialist, rapidly growing Bucharest, the urban natural environment suffers from degradation, under pressure from the real-estate market, the car-culture, and profit-oriented urban development projects. Dwellers of disadvantaged neighbourhoods are the most affected by the degradation of urban natural environments, because: they have fewer opportunities to escape the city, in the surrounding natural areas; have less spatial mobility towards the city parks, distantly situated in the “good areas”; the municipality invests less in the green infrastructure (bordering trees, green corners, waste recycling facilities) of poor streets. In the same time, they have less access to/ and less knowledge about eco-friendly daily practices: most of them dream about owning big cars and big houses, as symbols of social status; most of them are not responsible consumers, but opportunistic consumers; environmental education is available only now, as optional course, in some neighbourhood schools.

“Ferentari” is Bucharest’s most disadvantaged neighbourhood. Its scarcity of natural environments affects mostly the

youth. I will present their different reactions to this context, gathered through three years of action-research in the area: 1) the passive – stay ignorant to the situation, follow the profit-oriented trend in the social life of the city, or wait for opportunities to escape the neighbourhood forever; 2) the active – explore further away the city, in search of green spaces, or try to conserve the few corners of nature they discovered around; 3) the negative – destroy what is left. I also propose reflections upon the possibilities to enhance the youth's active reactions, in this context.

Approaching the 'Cultural Dimension of Sustainability': On Urban Cultures as Ecological 'Force-Fields' in Processes of Sustainable Development

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Keywords: Urban Cultural Ecology, Urban Culture, Cultural Sustainability

Drawing on basic ideas from the field of ecocriticism and cultural ecology, our contribution argues that urban culture is one of the central driving forces in urban systems, as it constitutes a quasi-ecological 'force-field' which serves both a seismographic as well as a catalytic function in urban environments. In other words, we propose that urban cultural practices and forms of expression both react to and contribute to making sense of the dramatic demographic, economic, political, and ecological challenges the metropolis has to face at the turn of the 21st century; in so doing, they bear a particularly regenerative potential, playing a significant role in the process of fostering sustainable development in cities.

Incorporating a theoretical conceptualization of the urban culture and a selection of case studies from Anglophone contexts, our paper thus sets out to contribute to an awareness of what Sacha Kagan and Volker Kirchberg have recently referred to as the 'cultural dimension of sustainability'. Moreover, the paper underlines the dire need to also approach

the issue of sustainable development from a Cultural Studies-perspective, illustrating that Cultural Studies may not only contribute to a deeper understanding of forms and functions urban culture, but, as a 'social practice' which refrains from the notion of power "solely as 'a problem of textuality,'" (Pfister 28) should also function as a basis for actual political decision-making processes geared towards the maxim of sustainable development.

Citation: Kagan, Sacha, and Volker Kirchberg. Sustainability: A New Frontier for the Arts and Cultures. Frankfurt am Main: VAS, 2008.
Pfister, Joel. Critique for what? Cultural Studies, American Studies, Left Studies. Boulder, Colorado: Paradigm Publishers, 2006

Urban Forest as an Innovative Open Space Strategy for Shrinking Cities

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In the last few decades shrinkage has become the norm for a growing number of European cities and poses a central challenge for planning and politics. In the last few years open space planning has made a number of suggestions about how the large number of urban brownfields can be dealt with, amongst others there is the proposal to plant urban forests. With respect to this the city of Leipzig has started the project “Urban Forest”. This aims to achieve several goals, an improvement in the urban climate and air quality, an increase of the value of neighbouring areas, an enhancement of recreational possibilities and a contribution to an increase in biodiversity. Whether and how the urban forest achieves these goals is the subject of an accompanying research. The sociological part of this research deals with the perception of inner-city brownfields and the acceptance and use of urban forest on these. For this, qualitative and quantitative surveys in the areas selected for the afforestation will be carried out. As part of the investigation photo methods will be used in all phases. In the presentation the first results of the sociological research will be presented which deal with the aspects of perception, acceptance and use of urban forest.

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- UB2** Di Turi, A.;
Weeds Management: a Case Study on the Urban Stone Walls of Genoa
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Architecture and Aesthetics of Roadside Vegetation.
- UB4** Nohr, C.; Sedmihradsky, A.; Buten, S.; Säumel, I.;
Cultural and Ecological Aspects of Historical Plant Use in Urban Parks:
the Examples of Johannapark in Leipzig and Bürgerpark in Bremen,
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- UB5** Klein, R.;
Long Distance Plant Dispersal in a Fragmented Canalized Urban River.
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Wastewater Irrigated Vegetable Cultivation along the Musi River in
Periurban Hyderabad, India.
- UB7** Miniero, R.; Iamiceli, A. L.; De Felip, E.;
On the Use of Bioaccumulator Indicators to Assess the Contamination
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- UB8** Schmidt, K.; Poppendieck, H.-H.; Jensen, K.;
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- UB9** Stork, H.-J.;
Crows in The City- Changing Urban Ecological Requirements and
Decrease of Wintering Russian Birds.

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PROJECT CITY 2020+: The City under Global Demographic and Climate Changes: An Interdisciplinary Assessment of Impacts, Needs and Strategies.
- EM3** Merbitz, H.; Ketzler, G.; Scheider, C.;
Spatio-Temporal Variability of Particulate Matter Concentrations and Urban Climatic Influences in the City of Aachen, Germany.
- EM4** Sachsen, T.; Ketzler, G.; Schneider, C.;
Optimizing Suburban Vegetation Structures for Better Cold Air Drainage Flow and Maximum Air Quality.
- EM5** Kotsyuk, I.; Hölscher, M.; Lenkerei, C.; Weber, F.; Säumel, I.;
Urban Harvest: How Healthy is Urban Horticulture? Heavy Metal Concentration in Vegetable Crops from Plantings within Inner City Neighbourhoods in Berlin, Germany.
- TMP1** Vásquez Fuentes, A. E.;
Environmental Assessment of Urban River and Stream Riparian Zones and their Potential as Greenways in Santiago de Chile.
- TMP2** Fitz, B.;
Resilience of "Rheinwuhrrkonkurrenz" Land Use in Austrian Lower Rhine Valley.
- TMP3** Diederitz, M.; Dijks, S.; Haase, C.; Haase, D.; Krellenberg, K.;
Straßberger, S.;
Conceptualising and Mapping Urban Ecosystem Services – a Student's Project.
- TMP4** Unalan, D.;
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Learning from Past: Discovering the Sustainable Mysteries of Old Cities (Special Case: Iran).
- TMP6** Langner, M.; Endlicher, W.;
Setup of an Online Measurement Network for Indoor Temperature and Humidity.

- PB1** Petzold, K.;
The Influence of Place-Related Attitudes to Local Sustainable Behavior during Multi-Locality.
- PB2** MoayeryNia, M.; Zarrinkamari, H.;
Greenways: Center of the Contemporary Cities.
- PB3** MoayeryNia, M.; Zarrinkamari, H.;
Green Boundaries.
- PB4** Messieux, N.;
The Ecology of the European Hedgehog (*Erinaceus europaeus* L.) according to its Enthusiasts.
- PB5** Montibeller, A. C.;
“Prey and Predator” Study of the Interrelations Noise in Urban Areas.
Lima Peru.

Submitted Poster Abstracts

Sustainable Planning and Policy

SPP1 Toward an 'artificial ecology': relational strategies of urban revitalization

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Keywords: Relational Strategies, Atlas, boundaries, urban thresholds

An ecological approach, focusing on the perception of the world as a complex network of relations, allows to reconsider human design as an active element within natural processes. This approach could be useful in facing the contemporary situation of European metropolis understood as a heterogeneous galaxy of traditional compact settlements, mobility infrastructures, different natural patterns, derelict sites, retail parks, and leisure enclaves that are crossed every day by more and more nomadic inhabitants. The aim of the 'relational strategy' research project is in fact to 'bridge the heterogeneous' through an adaptive design able, on the one hand, to deal with and give account of this multiplicity and diversity and, on the other, to reorganize these existing materials in an interconnected dynamic system. This implies operating at different scales in order to detect and enhance those relations able to 'bridge the missing link' between environmental processes management, 'practices of everyday life' and urban form. The ongoing project 'Relational Atlas' provides a new kind of conceptual matrix able to host an inventory of heterogeneous elements (including people, land, water, wind, urban settlements) and to highlight their potential

interconnections, describing sites as 'nodes of interactions rather than bounded places'. This research mainly focuses on Oltrepò Pavese territory, specifically on in-between spaces, boundaries, which, released from their former condition of barriers, are reconsidered as resilient and permeable thresholds able to become strategic fields for a radical transformation in time with the minimum requirement of economical and energetic resources.

SPP2 Re-transcriptions. The residual as material for the project.

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Keywords: residual spaces, ecological infrastructures, mapping

The paper aims to explore the intersection between the disciplines of landscape ecology and urbanism, with a focus on the possibility for ecological infrastructures to affect urban form in the same way as mobility infrastructures do today. Starting from a case study in the urban region of Milan, Italy, the contribution opens by recognizing the emergence of residual open spaces as both a topical feature and a tremendous asset in the current transformations of the built environment – not only concerning isolated scraps of land in between the urban fabrics, but also (and more strikingly) involving vast fragments of the agricultural landscape which gradually decay as they fall out of the mainstream logics of industrial productivity. These underused, scattered pieces of land nowadays contribute to the perception of urban territories as the contingent result of all kinds of intentions except for those who take the space of the city “as such” into consideration. The paper embraces on the contrary a simple hypothesis – the residual as material for the project – to unlock the opportunities afforded by the residual landscape for establishing an alternative urban organization which makes use of available open patches of

land to reinforce ecological infrastructures, and so re-edit spatial configurations at multiple scales. The contribution will offer a brief theoretical framework and describe three main challenges of the integrated spatial-environmental project on Milan's residual landscape: scale and frame, recycle and reuse, separation and co-existence. Maps, diagrams, photographic enquiries and other visual representations will contribute to describe these spaces, to make them available for reading as systems, and to begin the longer term project of their critical evaluation as structuring materials for the territory's regeneration.

SPP3 Urban parks as key element of sustainable cities between culture and ecological processes

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Keywords: ecosystem services, historical plant use, horticultural history

An important outcome of the current global change process is the world wide urbanization in a largely unknown dimension and dynamic of human history. The phenomena of megacity development, climate change and increasing social and ecological challenges require political and economical solutions on global and local scales. Communal urban parks originating from the 19th and early 20th centuries are key elements of the European heritage and provide numerous ecosystem services. Since the last boom period of urbanization in the 19th century the creation of urban parks within dense neighbourhoods was a crucial planning instrument to develop healthy and liveable cities. A literature review revealed relatively few general studies on contrasting roles of urban parks: 1) as historical footprints of changing park design and plant use patterns over time; 2) as historical relicts of rare cultivars ornamentals within park assortement as an aspect of cultural biodiversity; 3); as hotspots of urban biodiversity and as preserves for endangered species and

communities and related preservation principles for historical parks, and 4) as starting points for biological invasions of exotic ornamentals or hybridization of natives with non-native species. We evaluate the cultural and ecological impacts of horticultural history regarding to the nowadays challenges of urban planning, regarding to park preservation and creation of green spaces within the urban matrix and discuss how to enhance urban park functionality considering the increasing ecological challenges of global change processes.

SPP4 Prototypes and Guidelines for an Experimental City in a Regenerated Forest

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Keywords: Experimental policy, urban ecology, regeneration of land, mobility

The experimental policy process of Auroville, a city planned in 60's by the French architect Roger Anger in the proximity of Puducherry, India, and endorsed by the UNESCO ever since, has enabled a state of affairs which in our opinion opens a new perspective on urban ecology: a regenerated landscape ready to welcome now an alternative way of urban living. This paper aims to illustrate how the new interface between city, nature and people sought in this conference can expand its field of action from the conventional urban setting into areas such as, brown-fields, underutilized territories and barren lands. The site, characterized of a complete absence of vegetation, frequent wind storms and monsoon deluges which stripped it further of its meager topsoil, had been a dense forest in former times. Since 1968 the intense work of the earliest settlers – planting trees, retaining water and using means of farming organically – has made possible the regeneration of this land and the eroded topsoil, where the city will expand and grow. Further advancements have been the alternative water supply and irrigation systems stemming

from ancient techniques, as well as the planning of a low rise dense urban fabric characterized of solar passive protection and cross ventilation systems.

This research and design work results in a series of urban fabric prototypes and urban design guidelines which help build this city according to the original plan. These are grouped in the following thematic areas: mobility, housing typologies, land use, development phases and green master plan.

SPP5 Symbiotic Architectures

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Keywords: symbiosis, cooperative planning processes, hybrid building

Symbiotic architectures are generated by transforming restrictive determining frameworks into a requirement-profile-driven amalgamate of functions and users resulting in a social responsible economically, ecologically and aesthetically optimized structure. Our research is resulting in a case-study for a hybrid building concept [supermarket + housing + studio/workshop] enabled by an adapted use of the zoning plan as predeterminating planning tool. It is user-based collaboratively developed in a self-organizing group with a combined privat/commercial lease/freehold funding concept with subsidized studio- and workshop-spaces fostering with an undoped space for useful unemployment (1). The benefits of their symbiosis are of social [small scale community], energetic [use of waste heat], aesthetic [use of façade] and environmental [near zero footprint, urban farming] nature. We are researching in our own institute and in cooperation with German and European universities, the town council of Munich and other participants in a multidisciplinary way. Starting from social/demographic conditions the research stretches to ecologic requirements and economic restrictions, applied on smallscaled sites/objects and their possible reactive transformations into modules for sustainable cities. Our movens is the adaption of planning tools towards an approval of a symbiotic hybrid-building-concept as new social typology.

SPP6 The Green Future of the MegaProject: Where is the Architecture?

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Keywords: sustainable architectural urban planning, mega-cities, megaproject

The city faces a complex difficult future. Vast worldwide human exodus and consequentially emergent infrastructure inadequacies (water scarcity, booming population, inadequate waste disposal, irreversible natural resource depletion) loom large as daunting challenges to urban survival. Today we have renewed consciousness of the importance of such issues, as they threaten to impact the possibility of a viable urban future. Architecture has always been involved with creation of spaces that perform functional tasks while inspiring through ingenious management of resources. Environmental “sustainability” in design only brings to the forefront issues that should have never been neglected. Context evolves, yet the media of architecture remains embodied by the elements: space, light, geometry, proportion, color, texture, sound.

Respect and preservation for natural environment is architecturally necessary yet not sufficient, architecture’s mission remains to inspire, elate, enchant, mystify. This long held utopian ideal aspires not to celebrate the fantastic in honor of the exceptional but, perhaps more ambitiously, to provide a window into the spiritual depth of the quotidian, an

experience of architecture potentially available to all. Two examples: a series of conceptual megaproject proposals for South Korean cities, and Quartieri Parco Cà D'Oro, 3rd prize winner in a social housing competition, Venice. Here, courtyards, passages, terraces and stairs define a vast urban fabric conceptually covering the site; an adjacent park cuts through these systems with interstitial currents of flowing greenery, conveying shade and coolth through the fabric while allowing movement through different quarters. Life occurs in park and in city, without distinction or segregation.

SPP7 Good Practice, Low impact

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Keywords: Common future, European Role, Global Policy, Global action

The world's metropolises are interacting in new ways as a network of global hubs, which are expediting human migration, commerce in goods and services, financial flows, and the exchange of ideas and lifestyles. The faster speed of work, living and leisure in global hubs has led to new challenges including: environmental health in reaction to epidemic diseases such as SARS and swine influenza; responses to natural catastrophes and social crises such as the Asian tsunami and war on terrorism; and long-term environmental threats such as air quality and heat islands. The fact that Global changes no longer affect individual countries or regions but affect the whole of humanity is the trend towards sustainable urbanization especially in developing and newly industrializing countries. With respect to all has been and going to be done towards defining and improving sustainability in all its dimensions by European countries, unfortunately their efforts have low global impact as the majority of threats are done by countries which have little or no interest, awareness and legislation for sustainability. As an example in the case of our country Iran, there is no trend to integrate sustainable principles as they highly increase the construction cost and moreover there is the lack of experiment, awareness, knowledge and legislation.

SPP8 "Anti Ecological" town redevelopment - the example of Lublin.

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Lublin is the largest city in eastern Poland, at the same time is one of the poorest cities in our country. In the ranking of cities over 175,000 inhabitants took 15 (of 26) place. Lublin authorities for several years trying to improve the quality of life in the city, but this is not particularly successful. We have poor road infrastructure and only 26 km of cycle paths. Lublin is a very green city, but unfortunately in the reconstruction of the city center are increasingly being conducted felling of trees and winding up of city squares. Part of the investment is carried out without any public consultation, and some just because of consulting for many years are only in the sphere of the plans. As an example, plans for rebuilding and revitalization of Lithuanian Square (downtown), and changes in land-use environment of the Lublin Castle (whether the liquidation of markets and the transfer of the bus station).

Fortunately, many investments are made in the recycling of urban land use and construction type of brown fields areas. I would like to discuss a few examples of activities aimed at change city's image. Also I would like to show how urban investments contribute to a change of use of certain urban areas. I mean, for example construction on the city squares office buildings or car parks, but also want to show how for the people to change some of the neglected parts of town.

SPP9 Reurbanization of contaminated sites in Mexico

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Keywords: Reurbanizacion, contaminated sites, Mexico, practice examples

In Mexico exist a lot of abandoned foundries, refineries and mines. Their dangerous residues cause numerous contaminated sites in the country. The GTZ-involvement focuses on urban-industrial environmental management as well as urban planning in the concerning areas, supporting the Mexican Government to achieve its environmental and energy policy objectives. In some mexican cities there are successful examples for such reurbanizations. For example in Aguascalientes, the local government, townplanners and architects renewed the area of former workshops of the National Railroad Company. The workshops were constucted in 1903. They provoked a socially, economically and culturally growth for the city. After having found serious contaminations in the soil, in the year 1991 the government closed the area and decontaminated the soil. The city were in danger of losing an important historical and cultural place.

The local government proposed to rescue the area with all its buildings. A local architect was the supervisor for urban and

architectural planning. In 2007 the „Parque Tres Centurias“ was opened to the public. The Park offers museums, educational spaces, spectacles, recreation and familiar entertainment. The urban renewals increased the quality of life for the citizens and attracted more tourists. New jobs were generated. Apart from the shown project, the reurbanization of former contaminated sites in Mexico isn't common. To stimulate the attempts known from Europe and to incentive programs around this process, a lot of work is necessary. Trying to involve all actors, the GTZ helps to realize the process of reurbanization of former contaminated sites.

SPP10 Floating Islands – Floating Vegetated Rafts for Decentral Rainwater Management

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Keywords: Floating vegetation mat, floating wetland, evapotranspiration

Floating islands for stormwater treatment are surveyed for the development of vegetation living biomass, buoyancy provided by the plants and water retention by plant transpiration. Floating islands employ rooted plants growing as a floating mat on the surface of the water. Because of this feature they offer great promise for stormwater treatment applications as they are little-affected by fluctuations in water level that may stress bottom soil-rooted plants. Floating wetlands naturally occur in the early stages of peatland development, where they expand laterally from the shores of lakes over open water. Natural floating wetlands typically consist of a floating organic mat supporting plant growth, which is comprised of densely intertwined live, dead and decaying roots. Living biomass development of several helophytes is surveyed.

Evapotranspiration in these vegetation stands is influenced by above ground biomass, leaf area and ground cover and consequently affects the microclimate of the urban landscape. The below ground biomass affects the islands buoyancy by the plants aerenchyma and affects the waterbody by the

bacterial biofilm attached to the root surface. The amount of water necessary to keep a constant water level is providing information on the loss of water by the floating islands evapotranspiration. The project is initiated in summer 2010 and will proceed for the next two vegetation periods until October 2012.

SPP11 Complexity and the Commons, Rethinking Social-Ecological Systems in an Urban World

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Rapid urban development and subsequent environmental transformations are occurring at increasing rates. The majority of the world's population is urban and 80% is expected to be so by 2050. New ideas on socialecological frameworks and the interchange between people and their environment (built and natural) is bringing researchers to question how cities can become more resilient in the face of massive transformation.

This thesis reviews literature that discusses the social, ecological, and economic benefits of increasing ecosystem services in urban areas. By incorporating theories on the science of multi-stable states and resilience, and current research being done to assess how ecosystem services can contribute to urban resilience, I lay a framework for four case studies of programs that are part of a changing paradigm on the relationship between cities – and the people who live within them – and the natural world.

The program case studies are situated in New York, Rio de Janeiro, Nantucket and Kibera, Nairobi. An underlying theme rests in valuation and diversity. I ask, how can we develop systems of valuation that take ecosystem services into account from the start of urban development interventions, rather than as secondary externalities? How can we make cities more resilient, better places to live? I suggest that these examples, ranging from the industrialized to developing world, from civic organizations to government initiatives are relevant and important models.

Urban Biodiversity

UB1 Species-specific dispersal abilities, landscape configuration and environmental conditions predict species occurrence on urban wasteland

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Keywords: Abandoned railway area, CCA, Cfit values, Dispersal limitation, Fragmentation, Habitat connectivity, Predictability, Species traits

Urbanization particularly promotes habitat fragmentation, which strongly affects biodiversity patterns. In isolated habitat patches, a major driver of species loss is dispersal limitation. However, the relative importance of dispersal ability of species, local environmental conditions and landscape configuration for predicting species composition is still unclear. Addressing urban abandoned railway areas as study sites, we analyzed the relative importance of environmental versus landscape predictors (e.g. proportions of built-up, woodland and ruderal areas) with variation partitioning methods. Using a regression tree, we then characterized the effect of dispersal-related species traits on explained variation in species occurrence. We analyzed the difference in explained variation in the occurrence of individual species ($\Delta Cfit$) between a CCA with environmental predictors and environmental and landscape predictors together.

The results revealed that environmental predictors explained

a slightly larger amount of variation than landscape predictors. A sizeable increase in explained variation was found when landscape predictors were added to the analysis with environmental predictors. The most important predictors in the CCA were PAR, C/N and the proportion of ruderal habitats. For species with a long-term persistent soil seed bank, the regression tree model showed higher ΔC_{fit} values.

Linking dispersal-related traits to the predictability of species occurrence is a promising approach to reveal the interdependencies between species-specific dispersal abilities, landscape configuration and environmental conditions. Our results suggest that in fragmented urban habitats, a persistent seed bank is advantageous as it allows for stable populations once habitat patches have been colonized.

Citation: Westermann, J.R.; von der Lippe, M.; Kowarik, I. 2010: Species-specific dispersal abilities, landscape configuration and environmental conditions predict species occurrence on urban wasteland. Poster

UB2 Weeds management: a case study on the urban stone walls of Genoa (Liguria, Northwestern Italy)

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Keywords: Parietaria judaica, Erigeron karvinskianus, Genoa, stone walls

Parietaria judaica L. is one of the most allergenic species of Urticaceae; it is spread all over the Mediterranean area but it also reaches out the British Isles northwards, and Central Asia eastwards (Townsend, 1968). It is known as an alien species in the USA and Australia, as well. *P. judaica* lives preferably on walls in urban sites, and in some areas it can provoke allergenic symptoms all year long (D'Amato et al., 1998). The first purpose of this research was to determine whether different urban species could be introduced on walls of Genoa (North-western Italy), in order to restrain the diffusion of this undesirable weed and, in the meantime, to get an aesthetic improvement in "sensitive" sites (public yards, hospitals, school gardens). At first, attractive species, already living on Genoa urban walls, have been picked out: the selection has been limited due to the extreme specificity of this habitat. The exotic *Erigeron karvinskianus* DC., and the native *Cymbalaria muralis* s.l. Gaertn. B. Mey & Scherb. have been chosen for the first trials. Seed sowing and vegetative reproduction experiments have been carried out to evaluate

the possibilities of spreading these species on stone walls. Subsequently, shoots of *Erigeron karvinskianus*, the species which proved to be the easiest to grow, have been introduced on walls cracks where *P. judaica* was previously present. After one year ca. 10% of cuttings established and started growing and blooming, so far restraining *P. judaica* seedlings' settling.

Citation: D'AMATO G. et al (1998). POLLEN-RELATED ALLERGY IN EUROPE. ALLERGY, 53: 567-578.
TOWNSEND C. (1968). *Parietaria officinalis* and *Parietaria judaica*. Watsonia, 6: 365-373.

UB3 Nothing but boring weeds? Diversity of leaf morphology, plant architecture and aesthetics of roadside vegetation

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Keywords: ecosystem services, air quality, emission, immobilisation, leaf surface

High road and traffic densities are important features of urban landscapes and strongly associated with reduced human wellbeing due to elevated levels of air pollutants and noise. At the same time roads are public spaces, frequently used by urban citizen. Up to now only few studies focused on ecosystem services of roadside vegetation to enhance the amenity value of urban roads. Our study focus on plant species, which frequently grow along urban roads in Berlin to analyse the potential of different species to immobilize particles and to evaluate aesthetical impressions. We review characteristics of leaf morphology influencing particle deposition (e.g., leaf area, surface roughness, hairs or glands), parameters of plant architecture modifying local air flow (e.g., phyllotaxis, stem height) and aesthetical aspects (e.g., flower colours, flowering time, growth habit). In addition, we propose seed compositions adapted to different roadside habitats like median strips or tree plantings sites to enhance both, aesthetical and air filtrating effects of roadside vegetation.

UB4 Cultural and ecological aspects of historical plant use in urban parks: the examples of Johannapark in Leipzig and Bürgerpark in Bremen, Germany

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Keywords: ecosystem services, horticultural history, park design, urban park

Urban parks reflect the dynamic development of urban landscapes through changes in plant use, practices, and maintenance traditions resulting from an interplay of cultural-historical, socio-economical and ecological drivers over time. We focus on the aesthetical and ecological contributions of historical plant use, taking two urban parks as models (Johannapark/Leipzig and Bürgerpark/Bremen). We analysed park origin and development, park design and plant use history, and today's composition and historical footprints of woody species based on a literature review, archives research and by a review of current plant inventories. Both parks were designed in the "mixed style" with an extensive use of a great variety of exotic ornamentals. A large amount of the actual woody species belongs to the original plant collections. These relicts are focal points of the parks forming important habitats for the urban flora and fauna. Regarding the uncontrolled propagation and the potential spread of exotic ornamentals from the parks to their surroundings, we

observed contrasting patterns between both parks. Due to the specific local settings, to minor destructions during World War II and to a rigorous management and preservation regime over time, the interactions of the Bürgerpark Bremen within the urban matrix are limited to model effects for species choice in private green spaces like gardens. In contrast, for the Johannapark in Leipzig, the spread of exotic ornamentals from the parks to their surroundings has been reported and is mainly facilitated by the location of the park admit a green corridor.

UB5 Long distance plant dispersal in a fragmented canalized urban river

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Keywords: Urbanization, invasion corridor, long distance dispersal, samara

Urban habitats harbour high numbers of introduced plant species. Invasion along urban-rural gradients may be fostered by long-distance dispersal through river corridors. But the importance of hydrochory as effective secondary and often incidental dispersal vector for species richness or plant community structure and pattern in riparian systems downstream is still not well-defined. Many studies on the topic exist but only a few address water dispersal of invasive species in particular or a direct measurement of dispersal distances. So far the majority of studies focus thereby on natural and semi-natural watercourses while only a few investigate on effects by canalization, regulation, restauration or fragmentation in otherwise near-natural environments.

My thesis shall combine some of those rarely addressed aspects of plant dispersal in a small set of field experiments. The potential of the primarily wind dispersed, non-native and invasive tree species *Ailanthus altissima* Mill. Swingle and *Acer platanoides* L. for long-distance water dispersal shall be examined by releasing their tagged buoyant samaras into the

canalized river Spree in Berlin and analyzing their passage through and fate downstream of a turbulent junction with the river Havel (alternatively: a watergate). The results shall be taken into relationship with existing knowledge and may accentuate the need for integration of preventive actions and environmental management in urban greenway planning.

UB6 Agricultural Biodiversity as a Livelihood Strategy? The Case of Wastewater Irrigated Vegetable Cultivation along the Musi River in Periurban Hyderabad, India

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Keywords: Agricultural biodiversity, crop diversity, urban agriculture, livelihoods

Agricultural biodiversity ensures the nutritional basis upon which humankind depends and therefore plays an important role in ecological and socioeconomic contexts. The rates of loss however are alarming. For this case study, diversity in vegetable varieties in wastewater and groundwater irrigated gardens along the Musi River was mapped and compared. 54 varieties of vegetables from 20 families were identified. Among those, 18 were leafy vegetables most of which are usually cooked. Interviews with local farmers were conducted to better understand the decisions behind their crop choices. Most farmers interviewed used a highly intensive, short-term cropping system. Their work exposed them to pollutants like pesticides and industrial effluents. Their land tenure situation was insecure and they were faced with fluctuating prices of inputs such as seeds, pesticides and fertilizers. The perception of agricultural biodiversity among these farmers was positive, mostly for economic reasons, but also because it was seen as strengthening resilience against negative ecological impacts. Agricultural biodiversity was thus part of the livelihood

strategy as it helped to mitigate vulnerability. Previous studies showed that the use of wastewater for irrigation can have both positive and negative effects on agriculture. Besides possible health risks, fertiliser costs could be saved due to the high nutrient content of the wastewater. Agricultural Biodiversity is thus not necessarily diminished by the use of wastewater and can contribute in many ways to resilience, some of which are analysed and discussed in the study.

UB7 On the use of bioaccumulator indicators to assess the contamination level in a urban context

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Keywords: persistent organic pollutants, bioindicators, river pollution, air pollution

The chemical impact in an urban context, linked to human activities, includes end uses such as industrial processes and consumers. In this research in order to understand the potential impact of POPs on the urban environment (City of Rome) we considered two indicator species such as eel (*Anguilla anguilla*) and chub (*Leuciscus cephalus*) living in the Tiber river, and a bird species such the common swift (*Apus apus*). Among the three sectors of the Tiber river investigated (Ponte Milvio, Trastevere, and Magliana), some differences in contamination were found in the fish sampled. These differences appear to be only partly correlated to the sector sampled. The eel specimen data seem to indicate that the Trastevere sector, except for total PCBs, is the most contaminated site, whereas the chub data, on the whole, are more erratic. As a general interpretation, the divergence in concentrations of the different chemicals may be due to the different movement tendencies of the fish. This appears to be confirmed by the inter-site consistency of PCDD and PCDF profiles in the chub from the different sectors of the Tiber river.

The use of the common swift as a bioindicator is suggested especially to detect those chemicals that are known or expected to have a rather uniform distribution worldwide such as DDT, DDE, HCB and PCBs, even when at relatively low concentrations. With regard to substances with an uneven distribution in the environment, and long metabolic half-lives, the swift should be used with caution as a “chemical memory” related to previous exposures might interfere with the actual measurements. On the whole, the results show that the choice of a bioaccumulation indicator to assess the impact of POPs in the urban environment needs to consider its vertical and horizontal movement characteristics, its physiological features and its potential to individuate exposure sources.

Citation: Journal of Bioindicators, submitted
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UB8 Does climate influence plant species distribution in Hamburg?

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Keywords: plant species distribution, climate change, urbanization

Diverse and highly dynamic habitats, variable anthropogenic disturbances and favourable climatic conditions lead to high plant species diversity in cities. Climate change is expected to affect plant species distribution and therefore also plant species composition. One outcome of climate change might be an increase of invasions of non-native plant species from warmer areas. In Hamburg, mean annual temperature increases by 1 K along the urbanization gradient towards the city centre due to the urban heat island effect.

The flora of Hamburg consists of about 1200 plant species. Ecosystems in Hamburg are very diverse, including urban areas like the port area and the city centre as well as cultivated land, nature reserves with forests and peat lands and habitats along the river Elbe. Therefore distinct patterns in plant species composition can be assumed. The aim of the study is to detect patterns in the distribution of plant species in Hamburg and to identify the influence of climate and other ecological factors on species distribution and diversity patterns. We are analysing a floristic database of Hamburg mapped on a 1 km² grid scale. Preliminary results indicate that more post-1500 alien species and thermophilic species occur in the city centre than in rural areas. The impact of climate, land-use and other variables on the present plant species composition will be further analyzed by multivariate statistical techniques.

UB9 Crows in The City- Changing Urban Ecological Requirements and Decrease of Wintering Russian Birds

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Russian crows (*Corvus frugilegus*, *C. Monedula* and *C. corone cornix*) since the thirties winter in the Berlin area left. Once they came from Moscow through the Ural Range, reached Berlin in October and left first week of March. Researches were made students winter ecological projects, by radar studies and by avifaunistic monitoring. In the 70es 60-80.000 crows roosted at the Tegel lake and had spectacular roosting flights over suburbs and the city of Berlin. 1980 they changed their roost to Siemensstadt, 1990 to the central park Tiergarten, 2000 to some darker places in the center of the city near Berlin Dome. In the same time crows number decreased to 40.000, 20.000 and the least about 8.000. Once Berlin has been (like Munich or Vienna) a good foraging area. Many garbage dumps offered much food. Open fields around, city parks and feeding places were used by crows too. Reunion of the City of Berlin in 1989 and rebuilding of the crows. In 2005 the last garbage dump has shut by law and Russian crows have definitely gone. Only residents and some groups from Brandenburg and maybe Poland show last circles and squirrels around Berlin television tower.

Environmental Media

EM1 Assessment of the potential of urban organic carbon dynamics to off-set urban anthropogenic emissions

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Keywords: urban organic carbon pools, urban carbon mitigation

The impact of urban systems on current and future global carbon emissions has been a focus of many studies. Manifold mitigation options in terms of increasing energy efficiency are discussed. However, apart from technical mitigation potential urban systems also have a considerable biogenic potential to mitigate carbon through an optimized management of organic carbon pools of vegetation and soil. Depending on the climate and management of these organic carbon pools they can either constitute a carbon source or a carbon sink. Berlin city area comprises about 21.5% of forest area, ca. 5.3% of parks and green areas, 5% of arable land and various other areas with a large fraction of green space amounting to an extra ca. 14.5%. This constitutes not only a large area of active organic carbon pool dynamics within the city boundaries but also offers useful areas for carbon mitigation actions.

With a net sink of 4.7 Mio. t C per year German forests offset ca. 2% of Germany's emissions due to energy production which amounted to 231.1 Mio. t C in 2004. It has been shown that managed European grasslands can also act as a carbon

sink and that arable land offers valuable carbon mitigation potentials. Our objectives are therefore a) to estimate how large current vegetation and soil carbon stocks of Berlin are, b) what the carbon mitigation potential of Berlin's vegetation and soils is and c) how to optimise the management to increase organic carbon pools' sink strength.

EM2 PROJECT CITY 2020+: The City under Global Demographic and Climate Changes: An Interdisciplinary Assessment of Impacts, Needs and Strategies

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Keywords: Climate Change, demographic change, urban development

The City2020+ Project is part of the interdisciplinary Project House HumTec (Human Technology Centre) at RWTH Aachen University funded by the Excellence Initiative of the German federal and state governments through the Deutsche Forschungsgemeinschaft (German Research Foundation, DFG).

This research initiative CITY 2020+ assesses the risks and opportunities for residents in urban built environments under projected demographic and climate change for the year 2020 and beyond, using the City of Aachen as a case study. We investigate how the urban environment, political structure and residents can best be adapted, with attention to the interactions among structural, political, and sociological configurations and with their consequences on human health. The confluence of demographic change, an aging infrastructure, and global warming will overburden European cities and their aging populations.

Our research: (1) identifies the ways micro-climates in the city, health outcomes, and the urban environment are re-

lated, (2) assesses the risks especially older individuals face living and working in these conditions, and (3) proposes new strategies based on cooperation from the fields of medicine, natural science, demography, sociology, history, civil engineering, and architecture for adapting the city for future needs. Organized into 3 clusters, CITY 2020+ develops scenarios, options and tools for planning and developing sustainable future city structures. First results from measurement campaigns and surveys together with commendations for adapting Aachen's urban environment for the demands of the future climate and aging population will be presented in this contribution. This includes a risk assessment for the influence of climate and air-quality factors on human health and well-being.

Other Authors: C. Pfaffenbach, K. Selle, K. Wachten, C. Balzer, M. Buttstädt, K. Eßer, J. Hahmann, M. Klemme, A. Kröpelin, H. Merbitz, S. Michael, T. Sachsen, A. Siuda

EM3 Spatio-temporal variability of Particulate Matter concentrations and urban climatic influences in the city of Aachen, Germany

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Keywords: Particulate Matter (PM), air quality, urban air pollution, human health

Risk assessments for the exposure of urban population groups towards air pollutants like particulate matter (PM) are presently rather difficult because they require precise information about the spatial and temporal distribution of these contaminants in cities. The low density of measurement locations for PM makes a reliable mapping of the concentration difficult which is necessary for the estimation of the total population exposure and for the identification of "hot spots" with highest pollutant concentrations requiring action towards cleaner air most urgently. In this study, the spatio-temporal variability of PM is investigated by a combination of mobile PM₁₀, PM_{2.5} and meteorological measurements at 40 urban locations and GIS-based analyses of spatial influences like topography, traffic, building density and vegetation. An urban canopy model derived from airborne radar scanning and cartographic information is used for geostatistical analyses of the building structure. Meteorological and urban climatological data are included in order to estimate the conditions and spatial and temporal variability of local air exchange. The research

area is the city of Aachen (population 250.000) which is situated in a valley with an altitude range of up to 200 m with negative effects on air quality. The results show that local PM concentrations are largely influenced by traffic emissions as well as building structure and its effects on local airflow conditions. The temporal variability of PM levels is largely affected by synoptic scale forcing by different weather types and meteorological parameters especially local wind speed and prevailing wind direction.

EM4 Optimizing suburban vegetation structures for better cold air drainage flow and maximum air quality

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Keywords: climate change, urban climate, cold air drainage flows, human health

With reference to the IPCC Report 2007b average temperatures in Central Europe are projected to rise and summers might exhibit prolonged dry periods. Combined, Europe can expect enhanced thermal stress and higher levels of air pollution. Especially cities will be suffering from higher temperatures due to climate change, which leads to health problems of the inhabitants. As a consequence, the availability of an adequate supply with cool and clean air becomes more important. One possibility to supply mid-latitude cities in complex terrain with fresh air is nighttime cold air drainage flow.

Consequently, valleys with these ventilation functions require particular attention. Within the project "Kannegießerbach 2020+", in two valleys in the suburban area of the City of Aachen the flow circumstances are investigated. Especially increasing density and unfavourable position of vegetation is expected to affect drainage flow. Several measurement units were set up, most of them within the vegetation stands. In addition, further data are collected by mobile cross valley sections and tethered balloon measurements. First results of measurement

campaigns before and after the clearing of vegetation stands will be presented in this contribution. This investigation is part of the project 'City 2020+' within the interdisciplinary Project House HumTec (Human Technology Centre) at RWTH Aachen University funded by the Excellence Initiative of the German federal and state governments through the German Research Foundation (Deutsche Forschungsgemeinschaft, DFG).

EM5 Urban harvest: how healthy is urban horticulture? Heavy metal concentration in vegetable crops from plantings within inner city neighbourhoods in Berlin, Germany

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Keywords: contamination, pollution, urban gardening, urban food production

Nowadays, we observe boom years of urban horticulture. Various forms of urban gardening exist worldwide from the Allotment Movements, Intercultural Gardens or Guerrilla Gardening in European cities to City Farming in the Megacities of developing countries. Urban horticulture fulfills diverse functions such as food production, community building or the reduction of socio-economic and environmental problems. Compared to rural sites, horticultural crops in urban or periurban areas are generally exposed to a higher level of pollutants (e.g. heavy metals, pesticide residues, biological contaminants). Thus contaminations of urban horticultural products can exceed the precautionary values. In our study, we determined the concentration of heavy metals in the biomass of different horticultural crops of Berlin inner city plantings using Atomic Absorption Spectroscopy. We analysed the influence of local settings on the concentration of heavy metals. We revealed significant differences in the heavy metal concentration depending on crop species, planting style, local traffic and building structures. Based on this we discussed consequences for urban horticulture, risk assessment, planting and monitoring guidelines for cultivation and consumption of crops or crop products in urban landscapes.

Theories, Methods and Practice

TMP1 Environmental Assessment of Urban River and Stream Riparian Zones and their Potential as Greenways in Santiago de Chile

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Keywords: urban riparian zone, environmental assessment, Santiago de Chile

Traditionally the analysis of river and stream sides had been focused on rural and natural landscapes as well as environmental protection and nature conservation. However, nowadays there is an increasing interest and necessity to understand the environmental status, functions and possibilities of riparian zones in urban environments, in order to delineate and plan greenways which provide social and ecological benefits. Few studies have been conducted to evaluate the environmental status of urban riparian zones and even less to assess these areas in terms of their potential as multi-functional greenways. New efforts should be conducted to improve and complement these first approaches.

This research project is focused on the understanding of the environmental state of the urban river and stream riparian zones in Santiago de Chile and the assessment of their potential as urban multifunctional greenways. In this project it will be develop a comprehensive approach to assess the greenway potential of urban riparian zones to provide scientific knowledge as basis for the planning process. The

investigation is focused on the following questions: What are currently the dominant land use patterns along riparian zones and what land use changes dynamic have affected them? Which are the current environmental characteristics and functions of the riparian zones, in social and ecological terms? How to assess greenway potential so that all the many functions are properly incorporated and the benefits are maximized? A comprehensive method will be develop & apply which involves a greenway suitability analysis, identification of opportunities and constraints, the consideration of the land use/cover analysis, the landscape analysis and the identification of ecological and socio-cultural valuable areas performed.

TMP2 Resilience of “Rheinwuhrkonzurrenz” Land Use in Austrian Lower Rhine Valley

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Keywords: case study “Austrian Lower Rhine Valley”; river engineering

The Rhine Valley in the Federal State of Vorarlberg is one of Austria’s fastest growing regions. Since the 1960s it has been facing an urbanization process accompanied by urban sprawl. As a reaction, regional spatial planning instruments emphasize the disposability and preservation of open space and land use structures. In this context, the land use phenomenon “Rheinwuhrkonzurrenz” raises the author’s interest. Situated nearby Lake Constance, within the Rhine delta, the “Rheinwuhrkonzurrenz” area comprises space of varied use alongside the riverbank: farmlands, sports areas – and fields for gardening. These areas harken back to 19th century river engineering as an inter-municipal cooperation, characterized by cooperative administration of common land. An ongoing method-oriented PhD thesis asks for resilient traits and the development capacities of these areas, considering new planning instruments like the “mission statement of integration” as developed by the municipality of Dornbirn. In how far is the “Rheinwuhrkonzurrenz” a role model for intercultural meeting places within an industrialized/

urbanized landscape, as e.g. the garden fields are increasingly farmed by people with an immigrant background? Based on structuralist landscape assessment, the research setting allows to understand the landscape as a result of natural resources, economic decisions and social circumstances, aiming towards the implementation of equal opportunities for its users. In order to generate a holistic view of the “Rheinwuhrkonzurrenz” area’s development, the method setting integrates mapping, in-depth interviews and archival research. The results are evaluated with regard to ensuring the residents’ future access to land use and participation.

TMP3 Conceptualising and Mapping Urban Ecosystem Services – a student's project

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Keywords: urban ecosystem services, urban ecology, quantification, GIS

The concept of ecosystem services has been used to characterise agricultural, coastal or forest ecosystems and the benefits people gain from them. Rarely, the concept was applied to urban areas. To understand the importance of ecosystems within cities, it is crucial to know more about both supply and demand for such services. Therefore, in a student's project, we quantified a range of different urban ecosystem services: So doing, we focused on biodiversity, carbon storage, climate regulation, food production, recreation, water supply. The calculations were based on statistical methods, rule-based models and spatial GIS-analysis. To cope with uncertainties related to such quantification schemes, we have chosen two different urban regions, that is Leipzig-Halle (Germany) and Santiago de Chile. Data of land use, habitats, soils, tree cover, evapotranspiration, demography, socio-economic quality-of-life and transportation networks were used for the analysis. The resulting maps, dissimilarity and trade-off measures are presented and discussed in the poster.

TMP4 Approaches and Challenges to Urban Ecology

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Keywords: urban ecology, urbanization, ecosystems

There are different approaches to understand urban ecology. Some scholars distinguish between 'ecology in cities' that primarily focuses on the study of habitats and organisms within cities and 'ecology of cities' that focuses on urban ecosystem as a product of natural and social processes. Others emphasize a complex systems approach that sees urban ecosystems as complex dynamic systems of many interacting agents (Alberti and Marzluff 2004). There are also scholars who argue whether we need a distinct theory of urban ecology to understand ecological patterns and processes in the urban ecosystems or we can extend ecological theory to encompass human-dominated environments instead. Despite the presence of different views, urban ecology continues to evolve by piecemeal contributions of modelling, theory development and empirical studies, but increasing problems entail a quicker evolution of urban ecology to improve the human and ecosystem conditions.

This study aims to contribute to urban ecology studies by discussing different approaches and challenges to urban

ecology. Complex interactions between humans and ecological systems, natural and social sciences as well as transdisciplinary studies will be considered to achieve this aim.

Citation: Alberti, M. and Marzluff, J. (2004) Ecological resilience in urban ecosystems: Linking urban patterns to human and ecological functions, *Urban ecosystems*, 7:241-265.

TMP5 Learning from past: discovering the sustainable mysteries of old cities (Special case: Iran)

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Keywords: Historical city, Contemporary city, Sustainability, Principle, Pattern

The problems of contemporary cities caused all responsible people in different levels from government, policy maker, and planner to designer to become sensitive to solve this problem. After defining “sustainable development”, this phrase was also used extensively in urban design. When we consider our old, historical and traditional cities we understand that they were sustainable without using this kind of policies. They grew through hundreds years organically and always were alive and when we look more deeply we can understand that they have all three aspects of sustainable development. What make these cities attractive and pleasant for both the users of these spaces and burgess observers, is the character which can be remembered as the amount of responding to their users’ needs. This character can create “desirability” in such spaces which will covet everybody, in a manner that they want to have more portions of this lively sense. When we look deeper at them we can understand that the mysteries of their sustainability are hidden in their principles and patterns which answer all different needs of their users and pay

attention to all aspects of human. This kind of principles and pattern didn't produce at one moment but during many years due to the users' needs and we can say that the users mad. In this article we try to find their principles and patterns which make them to be alive for hundreds of years and compare them with urban sustainable principles. We don't want to use them exactly because they are not capable to answer human contemporary needs due to the excessive changes in human lifestyle. But they can become as a guidelines for future of our cities.

TMP6 Setup of an online measurement network for indoor temperature and humidity

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Keywords: indoor temperature, indoor humidity, online measurement network

It is well known that extreme thermal conditions such as heat waves have a negative impact on human welfare and even human health. If global warming is superimposed on the urban heat island, heat-related problems will increase in cities prospectively. A current warning system exists for extreme heat conditions operated by the German National Meteorological Service. This warning system is based on outdoor thermal conditions. Since most humans will stay indoors during hot-weather situations, indoor thermal conditions have to be included in such warning systems.

First steps towards an indoor measurement network are taken at the Department of Geography of the Humboldt-Universität zu Berlin. Currently, Hygrowin sensors (rotronic Messgeräte) are installed at several offices inside two buildings of the Department of Geography. These sensors are used to measure temperature and humidity inside the office. They are connected to nport-servers which are part of an online measurement network. Data are collected on a single server. The configuration of the system and first results of summer 2010 measurements will be shown.

Perception and Behavior

PB1 The influence of place-related attitudes to local sustainable behavior during multi-locality

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Keywords: Local preferences, place attachment, local sustainable behavior

The world is confronted with a lot of modern phenomena, like climate change and an increasing mobility, which are generally attended by the concept of 'globalisation'. Against this background the relevance of the social and physical aspects of space for local actors is frequently discussed.

Physical and social space can be analysed in the concentrated category of 'place' to what different preferences can exist and diverse attitudes can be developed. Individual preferences to the local environment (e.g. clean surroundings, beautiful landscape or pleasant weather) as well as especially the attitude of 'place attachment' are often seen in their importance for local sustainable action and behavior, like the consumption of an ecological supplier of energy or of local products, the choice of transportation means and so on.

A special kind of modern geographical mobility is the so called 'multi-locality' (or 'cyclical/seasonal migration' respectively 'nonpermanent residents'). The rotational dwelling on more than only one place can be focused as a new pattern of mobility that is conceptually positioned between every-day-

commuting und life-long migration. Multi-locality is often economically inspired and shows empirically differentiated characteristics (e.g. shuttles, living apart together). Applying some place-related attitudes and preferences to the phenomenon of multilocality the matter is given which effects on local sustainable behavior at the involved places could be observed. Theoretical assumptions and empirical results are to be combined in a poster which are based on data of an explorative online-survey between multi-locally organized persons, the author arranged within his dissertation project. In this way the importance of local attachment and local preferences for local sustainable behavior during multi-locality will be exposed.

PB2 Greenways: center of the contemporary cities

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Keywords: Greenways, Wholeness, centering process, Coherence

Christopher Alexander in his book “a new theory of urban design” has defined a first step of a process which is responsible for “wholeness” and then 7 intermediate rules to embody the process at a practical level. Later in his latest work “The Nature of Order” he defined a small number of geometric properties to be responsible for this wholeness in the space. He also called that single process which was capable of generating the wholeness as the “centering process”. At a glance we can understand that greenways through city due to their properties and functions such as Connectivity and Integration can define as this centering process of a city because they can easily connect different spaces of the city to each other and therefore makes wholeness through city. This character can create “coherence” in city spaces which will covet everybody. Greenways keep natural, historical and cultural sources and enhance their quality, create charming open spaces for different social activities and a net of continuous connections between different societies, parks, secretive centers and cultural, historical spaces. In this article it’s tried to reexamine

Alexander theory about wholeness which was mentioned above based on real samples and examples of greenways. On the other hand this research is a test theory regarding this substantiation theory which can create coherence in cities.

Citation: Alexander, Christopher, A New Theory of Urban Design, Oxford University Press, 1987
Alexander, Christopher, The Nature of Order Book 1: The Phenomenon of Life, Center for Environmental Structure, 2001

PB3 Green Boundaries

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Keywords: Boundary, Edge, Green zones, Quality of life

Among various parts of any city there are some boundaries which are defined in many ways. In Christopher Alexander's point of view quality of life within any wholeness is strongly affected by these boundaries. This article will argue the ways which this quality can be improved based on Alexander's ideas, either by defining different zones by landscape or defining green zones through different parts of a city. First of all Alexander and his coworker Professor Nikos Salingaros insist on quality of life as a measurable parameter which can be recognized and improved easily. By their ideas any boundary must be constructed based on some rules involving thickness, relative to dimensions of the bordered area which directly influences the life of the area. Secondly there are some ways of composing green zones with other areas by the means of revised and extraordinary boundaries which can add possibilities of interaction between zones based on organic specifics of the boundary. Actually recent researches show that live particles have transmittable boundaries with some specifics. In fact, it seems possible to improve the quality of life within a city by these two ways, first, composing green zones with existent zones through new boundaries defined by Alexander and Salingaros. And as a secondary attitude, defining new green boundaries for existent zones.

PB4 The ecology of the European Hedgehog (*Erinaceus europaeus* L.) according to its enthusiasts

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Keywords: urban nature, knowledge, hedgehog, suburbs

In 2008, we did a social science research on hedgehog enthusiasts living in suburban areas near Paris (France). These people are linked one to another, mostly through an Internet forum. They have all sheltered, healed or helped one or more animals. Our results show that their expertise in caring for this species is high. They are often able to save animals that would die without human intervention. In contrast, they mostly overlook or misunderstand hedgehog's ecology. That is intriguing because prevention of accidents and survival of animals released into the wild is important to them.

The ignorance of some key elements of the wild and outdoor life of the hedgehog raises questions, given that its ecology is pretty well documented by scientists and that monographs make this information accessible to the general non-scientific public. We examine some explanations for this ignorance. Do carers have no need for this type of knowledge? Are they (voluntarily?) unaware of their surroundings and therefore unable to picture correctly the life of the hedgehog in the neighborhood? Is ecological information too difficult to

understand or too badly explained in books for the non-scientific? Or does this highlight a frontier between wild and domestic which extends to the knowledge of the species?

Citation: Messieux N. 2008. Les protecteurs des animaux : le cas du hérisson. Unpublished master thesis. Paris : Muséum national d'histoire naturelle.

PB5 “Prey and predator” Study of the Interrelations noise in urban areas. Lima, Peru.

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Keywords: Soundscape, acoustic ecology, sound pollution

Prey and Predators is an investigation carried in Lima between the years 2007 and 2008 in four places selected by 240 people. This study demonstrates the interrelationships of competition between species in Hi-Fi and Lo-Fi soundscapes. It was also analysed the perception of people in reference to their surroundings, understanding certain habits around sound, useful in the search for urban ecology in the most inhabited environments. Regarding the investigation and field work it was used the communication process and principles of biology, referring to interactions between species, prey and predators, in the context of acoustic ecology and soundscapes.

After the analysis of 240 surveys, 48 audio files (table 1) and their respective registration forms, was achieved:

I.-Different categories of transmitters and receivers, or sound prey and predators in Hi-Fi and Lo-Fi contexts. This allows us to understand the communicative interaction in the soundscapes analyzed. II.- In the communication process have been identified weaknesses in the reception and response

of messages due to the fusion of sounds. III.-Identify five main predators sounds (table 2). IV.-Because of their habits of perception and emission, Lima citizens are used to sound waste and are addicted to it. The city lives with this sound waste and generates it daily, indiscriminately and resemble of someone who suffers from cacosmia (to perceive as pleasant the pestilence).

Abstracts
The Graduate Research Training Group 780/III
„Perspectives on Urban Ecology“

Contribution of ethnic minorities in the creative industries in Berlin - Turkish entrepreneurs in the design, visual and art market

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Keywords: Creative ethnic minority businesses, creative industries, migration, Berlin

The integration of the Turkish second generation into the German labour-market is considerably low. Nevertheless, the percentage of this group who are self employed in Germany is increasing more rapidly than the percentage of self-employed Germans in the last few years. Mostly second-generation Turkish workers become self-employed in the traditional field of commerce, hotel and restaurant industry. It is hypothesised that more and more people of the Turkish second generation are setting up a business in sustainable economic sectors such as the creative industry. I examine what impact an immigrant background has on entering into and working in the creative industry. The results are based on qualitative interviews with 11 Turkish entrepreneurs in the design, visual and art markets. The findings strengthen the assumption that Turkish entrepreneurs in these sub-markets share similar values and basic order in postmodern migrant-milieus. The opportunities to enter into the market of creative industry are good due to high professional qualification and strong institutional and financial resources. Results suggest

that Turkish entrepreneurs in the creative industry have specific transcultural business practices and act in a creative trans-local space. Both of these aspects of transculturality were found to be main characteristics of the interviewed entrepreneurs of Turkish descent. Immigration quarters are important locations for their entrepreneurship in the creative industry. This is conducive to sustain the quarter in terms of positive effects on social and economic structures. The creative industry offers a chance for the Turkish second generation to a better integration on the labour-market.

Perception of Climate Change in a Pacific Island City

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*Keywords: Climate Change, Perception, Adaptation, Small Island States,
Fiji, Weather, Sea Level Rise*

According to the International Panel on Climate Change (IPCC 2007) small island states (SIS) will be severely affected by global climate change. Especially a rising sea level, increased frequency and intensity of extreme weather events and rising temperature will have serious impact on life on small islands in tropical regions. SIS hardly contribute to the emission of greenhouse gases, therefore their main challenge will be focussing on adaptation to prevent further damages.

In April 2010 a survey with 180 participants was conducted in Nadi, Fiji to see (1) if people already perceive environmental changes, (2) if they expect changes for the future and (3) how they assess four coping strategies: protection, adaptation, retreat and engagement. Additionally religiousness, information behaviour, role models and sociodemographic variables were included to study processes that influence perception and coping behaviour.

Preliminary results show that compared to the past thirty years people perceive higher temperatures, an increased frequency and intensity of cyclones, as well as rising sea level. For the future most people expect environmental changes to be more severe and express the opinion that this will significantly influence their life. Most respondents feel responsible for preventing damages due to environmental changes in their own households. At the same time there is a strong religious belief that the islands will be protected by God so people can live there forever. Concerning the coping strategies retreat is rated as least appropriate solution compared to protection, adaptation and engagement.

An urban ecology perspective on microenterprises in the cultural- and creative industry in Berlin

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Keywords: Cultural and Creative Industries, Network Interactions, Sustainability

In Germany, Berlin is one of the international centers of creative and cultural production. The cultural and creative industries have grown enormously in the past decades. In the field of urban ecology and its debates about the ecological city of the future spatial and social aspects of cultural and creative industries became an interesting research field. Creative firms are considered to be innovative, dynamic, flexible and affected by the milieu where they locate. Small specialized firms and start-up ventures especially tend to locate in deprived areas of the city. The cultural and creative economies therefore can make a step towards minimizing the land use through internal development and benefit their surrounding location by effects for the local development. Therefore the social dimension of urban ecology regarding the agglomeration of cultural and creative economies in the deprived city quarter Reuterquartier in Berlin will be discussed. The central element of this approach is to reveal the various effects of the different markets in cultural and creative economies in relation to their level of spatial embeddedness and whether there are

differences depending on the locations on micro scale level such as store front level or upper level. Furthermore the approach examines new evidences in economic geography by discussing the relationship between network behaviour and micro location. Finally the relationship between network interactions and the impacts of creative and cultural industries on local neighbourhood development will be outlined. The analysis is based on a quantitative and qualitative case study.

Species specific ability in mussels to cope with cyanobacterial toxins – one factor for distribution in eutrophic urban water bodies

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Keywords: urban waterbodies, cyanobacterial toxins, biotransformation, glycogen content

During summer month, slow current and high nutrition load characterizes the urban waterbodies of Berlin, favouring mass developments of possibly toxic cyanobacteria. During cell lysis of cyanobacteria, cyanotoxins are released and pose a threat for aquatic organisms as well as for humans enjoying urban waterbodies. Freshwater mussels as *Dreissena polymorpha* and *Unio tumidus* with high filtration activities may accumulate cyanobacteria and their toxins during cyanobacterial blooms.

This study compares the invasive *D.polymorpha* to the native *U.tumidus* in regard to their detoxification capacity for microcystin, the most common cyanotoxin in freshwater. Mussels were exposed to 10 and 50 µgL⁻¹ microcystin-LR for 24h and 7d. The biotransformation and antioxidant activities (glutathione S-transferase, GST, catalase, CAT) are correlated to physiological costs (glycogen content) for the organisms.

Enzyme activities and glycogen content of *D.polymorpha* were measured in whole mussel tissue and of *U.tumidus* in the digestive gland. sGST activities increased during the

exposure period in *D.plymorpha* but decreased tendentially in *U.tumidus*. Catalase activity was not affected in both species. The glycogen content decreased after 24h in both species indicating the energy requirements due to the stress caused by the MC-LR exposure.

We conclude that *D.plymorpha* is capable of detoxification of MC-LR but at expense of energy. The results suggest that *U.tumidus* is less able to detoxify MC-LR *via* biotransformation enzyme GST. Nevertheless, there was an enhanced requirement for energy, as indicated by reduced glycogen contents in both mussel species. Compared to *U.tumidus* the invasive *D.plymorpha* seems to be better adapted to cyanotoxin exposure.

Wasteland shouldn't be wasted: Creating attractive and species-rich grasslands on urban demolition sites

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Keywords: restoration ecology, shrinking areas, greening methods

Species-rich meadows are sharply decreasing within European cultural landscapes due to intensified agricultural practices. Simultaneously, enormous free spaces evolve in shrinking cities. We hypothesise that these areas have great potential for developing extensively managed meadows because conservation objectives can here be combined with aims of low-maintenance greening and as recreational spaces for residents. In our field experiment which is situated directly in large-scale housing areas in Berlin, we test whether disused urban areas can serve as substitute habitats for species of extensively managed meadows. From the beginning, local planners, land owners, and residents were involved. As sites are highly isolated from existing meadows we tested different restoration methods to overcome dispersal limitation: hay transfer from regional nature conservation sites and seeding of regional seed mixtures. We compared plant species richness and diversity of the different treatments and related environmental variables to the establishment success of target species. We revealed an overall higher species richness in

treated plots compared to untreated control plots: 48 species in seeding and 39 species in hay treatments compared to 28 species in control plots. The success of treatments differs though: in seeding treatments, 22 of the 26 target species were found, whereas 8 of 16 target species were determined in treatments with hay transfer. Habitat modelling showed that soil parameters in particular are important for the successful establishment of target species. Thus, new urban grasslands may serve as substitute habitat for species decreasing in the cultural landscape and hereby involve objectives of planners and residents.

Fate of the cyanobacterial toxin Microcystin-LR during bank filtration – column experiments and modelling

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Keywords: Microcystin-LR, anaerobic biodegradation, column experiments

Bank filtration is a common measure of drinking water production in many urban areas. Among other organic compounds soluted in groundwater, the natural cyanobacterial toxin microcystin-LR may pose a danger to human health if it is not eliminated during bank filtration. Relevant elimination processes include sorption and biodegradation. The latter causes depletion of oxygen in the sediment and production of anoxic zones in the underground. Although presence or absence of oxygen as electron acceptor for microbial energetic metabolism is a crucial factor for degradation most studies focused on aerobic biodegradation of microcystin-LR. For a better understanding of anaerobic degradation of microcystin-LR during subsurface sediment passage laboratory column experiments were designed to simulate transport and degradation conditions in the aquifer. Considering the anoxic degradation behaviour of the toxin the redox state of the system was assumed to be the most important factor and therefore varied during the experiments by adding supplemental nitrate or nitrite. Anaerobic closed - loop column experiments showed that if nitrate is present in high concentrations degradation of

microcystin-LR occurred much faster than without nitrate indicating a possible coupling of microcystin degradation and denitrification. Addition of saccharose as an extra energy source did not result in a decrease of microcystin-LR, indicating, that anoxic biodegradation of microcystin-LR is a co-metabolic process in which compounds that are easier to metabolize – like saccharose - are preferred by the present microorganisms. Parameters of the anaerobic degradation kinetics were quantified by creating an inverse MATLAB model basing on Monod kinetics with nitrate as electron acceptor.

Stress and the City - Well-being in Berlin Neighborhoods

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Keywords: environmental stress, noise, air pollution, urban green space, neighborhood satisfaction

Empirical evidence shows that urban environmental factors such as air pollution and noise may have impacts on the physical and psychological health of city dwellers. Among the few published studies addressing such effects on mental well-being, most have only investigated exposure to a single stressor. However, as suggested by literature on environmental stress, it is hypothesized that the accumulation of multiple ambient stressors is a key aspect of mental health consequences on a neighborhood level. A geographical information system provided by an urban ecology research program in Berlin was used to select socially and structurally comparable study sites with varying levels of critical environmental factors (low vs. high).

These factors (traffic noise, air pollution, and availability of public green space) had been determined by an online survey completed by 780 Berlin residents. A household questionnaire survey (n = 420) was conducted among residents of these

sites. Residents from neighborhoods with a high level of critical conditions differ from residents living in low-level areas in regard to perception and appraisal of the objectively varied factors, in neighborhood satisfaction and in health behavior. Predicting neighborhood satisfaction, air quality and availability of public green space concur in an additive way. Subsequent research steps are discussed.

Gardening Exhibitions as Instruments of Sustainable Urban Development

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Keywords: Urban planning, Gardening exhibitions, Events, Sustainability

Gardening exhibitions have become major events and prominent instruments of urban development. Yet, despite their impact on city development, this has not been systematically investigated so far. Hence, this research project draws on the effects of gardening expos on urban sustainability in terms of:

- 1) the implementation of planning principles
- 2) city image production
- 3) aesthetisation, urban renewal and participation

For the city, winning an expo means winning large amounts of public subsidies and private investment as well as media attention and tourists. Setting up large-scale expo venues speaks to the needs of creating urban parks, producing or even changing the image of the city, and accelerating urban renewal which would otherwise simply not have been possible. Furthermore, the expo planning has a disciplining effect on the political and economic stakeholders of the city who concentrate their power on this single project. Therefore, it has to be examined whether, and to what extent, there are

sustainable effects of the exhibition after its temporary show time of six months.

Against this background, this project is focused on a comparison of the Federal Gardening Exhibitions (Bundesgartenschau) in Munich 2005, Schwerin 2009, and of other international and domestic expos in Germany, Japan, and Taiwan. Using qualitative and quantitative techniques of empirical social research, 50 interviews with international experts and a survey with 521 citizens have been conducted. On this basis, it is analysed both how gardening expos can be used properly as unique instruments of sustainable urban development and why expo projects may also cause future problems.

Aesthetical enhancement of vegetation in residential areas by adding prairie and steppe species

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Keywords: aesthetical enhancement, spontaneous vegetation, plant establishment

Due to the process of shrinking cities large areas with no intended use do appear. Possible solutions aim at an enhancement of natural vegetation which is aesthetical attractive and inexpensive.

The aim of this study is to investigate if it is possible to establish target species in an existing plant community and if these communities are perceived as aesthetical enhanced.

In a field experiment we have studied the establishment of Prairie and Steppe plant mixtures in spontaneous vegetation since 2009. The experiment is situated in a large scale housing area of Berlin on 8 sites, each with 4 plots (3x3m). A special focus was set on the aesthetic appeal of the sites.

The Survival of the target species differed significantly between the mixtures. While Prairie combinations showed only weak survival rates between 13 and 22% after the second year, the survival rates of steppe combinations reached about 57%. A comparison between the survival rates of

2009 and 2010 revealed a strong decrease in survival in the second year. This decline of target species could partially be explained by extreme weather conditions in 2010 in addition to unfavourable site factors. In 2010 most of the species had not reached sufficient height for being visible within the surrounding spontaneous vegetation. Therefore, a marked change of the visual appearance of the vegetation has not been achieved.

In a further step we will assess how survival success of the target species can be explained by either environmental factors or competition of the resident vegetation.

An integrated land use change and ecological impact model: the case of Berlin

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*Keywords: urban modeling, cellular automata, system dynamics,
residential choice, shrinkage, Berlin*

For the conservation as well as the improvement of human-life quality in an urban context, today's decision makers are confronted with the complexity of diverse interactions between human activities and the natural environment. Those interactions find their expression in heterogeneous land uses which represent the predominant cause for local ecological impacts (EI). We present an improved urban land use change (LUC) model integrating the functional chain of EI. The study area outlines the Berlin metropolitan area. For the adaption to current needs regarding urban development of western societies we cover growth and shrinkage dynamics. Consequently, transformations from built-up area to urban brownfield and back to "green uses" are reproducible. Further, we integrate a decisive classification of varying residential structures which are quite striking regarding to their different EI. The model

consists of 3 modules. The demand and supply model contains the causal linkages of preference-driven residential choice and demographic change using system dynamics. The allocation model is represented by a cellular automaton to simulate the spatial allocation of changing land uses. The effects on the urban ecology based on scenario settings are derived within the impact model. We focus on (1) green provision, (2) loss of arable land, (3) sealing rates, (4) densification/depletion and its spatial specifics. All modules are interlinked by feedback loops whereby LUC can be analyzed as a consequence of its own effects. Finally, the model will be discussed with local planning authorities to estimate its practical relevance as a supporting tool for decision making.

Threatened bird species in the city—nature conservation value of urban waste lands

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Keywords: urbanisation, Species of European Conservation concern

Bird species of cultural landscapes have been declining dramatically for decades. Main cause is intensified agricultural practice. At the same time, worldwide urbanization increases and has huge impacts on land use. Urban waste lands are known to provide habitats for endangered beetles and grasshoppers, but there is no systematic research on birds, yet. We aim at assessing characteristics of urban waste lands that meet the requirements of threatened bird species.

We surveyed birds on 55 waste land sites dominated by sparse vegetation in the city of Berlin, Germany. Boosted Regression Trees were used to model occurrence of 1. number of Species of European Conservation concern (SPEC) and 2. five SPEC species: House Sparrow, Tree Sparrow, Crested Lark, Wheatear, and Tawny Pipit.

On the studied waste lands we found twelve SPEC species. Woody vegetation and high grass decreased occurrence probability for most threatened species. Short grass, sand, and sparse vegetation were beneficial. Direct disturbance by humans or dogs affected only Wheatears slightly. Amount

of impervious surface and density of residents had differing effects, depending on species and spatial scale. Area size influenced conservation value. As a rule of thumb, plots above two hectares provide habitat, those above seven hectares are valuable for several threatened open-land bird species.

Urban planners and landscape architects should consider the potential of waste-land habitats for nature conservation. Knowledge about crucial habitat features (few trees and shrubs, sparse vegetation) enables us to create closer-to-nature urban greens that enhance protection of species.

Temporary uses as part of a paradigm shift from “the permanent” to “the temporary”?

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Keywords: Temporary uses, Post-Fordism, Berlin

Temporary uses of brownfield sites and vacant buildings are an increasingly important topic in urban planning and politics since the 1990ies. Both the supply of (temporary) brownfields and the demand for these areas has increased due to fundamental social changes such as the increasing acceleration and flexibility in urban (and as well in individual) time patterns and the socio-economic transformation from Fordism to Post-Fordism. It is assumed that in the best case all stakeholders can benefit of temporary uses: The temporary user can rent space for a low amount of money, the landlord can reduce his maintenance costs and the municipality can avoid the negative affects of extensive vacancy and decay in certain areas.

In this project the phenomenon “temporary use” will be examined in the larger context of social change, starting with the motives and objectives of the stakeholder. The aim is to obtain a sound theoretical explanation for its growing importance and answer the question whether temporary uses are part of a social paradigm shift from permanent to

more temporary solutions or just a short-living fad. Resulting research questions are: What are the motives of landlords to allow temporary uses on their property? What are the motives of temporary users and what kind of user types exist? How big is the influence of the municipality on temporary uses on privately owned land? Using a qualitative and exploratory approach, several case studies of temporary uses in Berlin are investigated.

Studying run-off dynamics and infiltration performance of pervious pavements using high resolution lysimeters

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Keywords: runoff dynamics model, infiltration, soil surface storage, weighable lysimeter, climate change

In the view of soil hydrology, one of the most important aims of sustainable urban development may be to plan the urban water management system for water balance that remains unchanged from the natural water balance as much as available. Herein, pervious pavements play a large role owing to their performances for high infiltration, water storage evaporation, especially in the context of increasing percentage of paved area in cities.

This study presents a dynamic runoff model of paved soils, considering the rainfall event intensity as the dominant factor on the dynamical runoff process. Two pavements were chosen: Bernburg Mosaic Cobblestone and Concrete Paving Slabs, which may be typical for big parts of Berlin and East Germany. A high-resolution weighable lysimeter system with runoff measurement takes center stage in experiment. While the abovementioned pavements were used as lysimeter surface, the upper boundary condition of lysimeters was constructed nearly realistic to the urban conditions.

The different behavior of runoff dynamics and infiltration performance are analyzed. The model was applied to the annual rain sequences of 2010. A good agreement was found between the observed and calculated runoff curves in case of concrete paving slabs, but not as good in the case of mosaic cobble stones. The error that may stem from using only intensity dependent RC was analyzed. The further influences of other significant rain properties such as rain duration and time variation of rain process are described. Finally, the annual water balance is calculated based on the new runoff model.

High Resolution Remote Sensing for Urban Ecosystem Service Analysis

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Keywords: multi-temporal, intra-annual, intra-urban, LiDAR, rapid eye, ecosystem service, environmental justice

As a unique attribute urban space is divided into spatial units of social disparities, economic centers and green ecological islands. Research will not address such issues if the urban is taken as a single unit. As the urban is becoming the growing space of future development and population attraction, *intra-urban* analysis still lacks research and has to be addressed in more detail. As Phoenix (Arizona) and Baltimore (Maryland) put a strong research focus on urban LTER (long-term ecological research) already, it is still limited to few cities. Major problems of urban ecosystem analysis are a patchwork of different multi-source datasets, narrow spatial bounding of information, differences in acquisition time, lack of updates as well as missing volume data on vegetation. Beside long-term analysis urban short-term analysis of intra-annual changes needs further update. This case study pursues a remote sensing approach of urban trees to tackle these problems. A *multi-temporal* dataset of high resolution *Rapid Eye* satellite images (5m) from 2009 and very high resolution *LiDAR* (0.5m)

shall be used to improve classification details of urban tree species as a unique base for comparative analysis. Isolated vegetation analysis does not become redundant, but rather urban *ecosystem services* connect services of vegetation to socio-economics. As volume data of urban trees will be generated it will be tested to be a measure of a specific ecosystem service. Findings will be analyzed in correlation to social-economic parameters in terms of spatial distribution which will lead to *environmental justice*.

State of the Art: Soil Communication and Conservation in Arts and Urban Culture

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Keywords: Soil Art, Soil Communication, Urban Soils, Pedo-Aesthetics, Environmental Arts

The rise of industrial agriculture paired with a global demographic shift of populations from rural to urban settings has diminished everyday interaction with soil for most members of society. This has led to a deterioration of the aesthetic image and cultural value of soil. Among other efforts to increase soil awareness, concerned artists have been reclaiming the image of soil as a culturally, aesthetically and ecologically invaluable common good. From the early environmental art of the 60s and 70s to more recent artworks on urban and industrial brownfields, soil functions such as growth medium and habitat, archive and contamination filter have become subject matter for artistic expression and public discourse. In the following paper we present soil in the context of the environmental arts movement as well as art in the context soil science. How can art contribute to soil conservation – both with the aim of generating greater public understanding and promoting cultural values, but also by developing creative methods to directly confront problems such as contamination, erosion, or humus loss? Based on a historical review of soil-related artworks, a survey of soil scientists, expert interviews with artists, and our own creative field experiments, we address the use of art in bridging communication gaps between soil conservation and the general public.

The potential contribution of vegetation to ambient PM concentration in the city of Berlin – First results of the determination of biogenic organic compounds with GC-MS

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Keywords: biogenic aerosol, SOA, organic tracers, GC-MS, Berlin

Biogenic organic compounds are important constituents of ambient particulate matter (PM). Depending on the vegetation structure, secondary organic aerosol (SOA) formed from biogenic precursors make up between 50 - 90% of the total SOA. Because of their pronounced effect on atmospheric chemistry and climate they are of great interest in current research activities. In order to obtain information about individual secondary sources, the identification and determination of individual compounds is necessary. Previous studies on single biogenic compounds occurred mainly over boreal forests or under simulated laboratory conditions. In urban regions, however, the focus was on the determination of organic compounds from mainly anthropogenic sources. The aim of this project will be to examine the potential contribution of vegetation to ambient PM 1 and PM 10 concentrations in the city of Berlin, focusing on individual tracers such as Levoglucosan for biomass burning, or oxidation products of α -pinene and isoprene as tracers for the activity of vegetation. Therefore, samples from three different

measurement sites are analysed by GC-MS. Samples from February to June (PM 10) show a clear difference between the seasons. Whereas Levoglucosan has highest concentrations in February and March (100 – 500 ng/m³), the oxidation products of α -pinene and isoprene cannot be found in the winter samples. From April to June, the concentration range is from 0 – 56 ng/m³. These first results do not show a clear correlation between the occurrence of specific compounds, but per sampling day occurring compounds can mostly be found at all stations with a slight increased concentration at the background station.

Regulating and cultural ecosystem services of road side vegetation in urban landscapes

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*Keywords: ecosystem services, spontaneous road side vegetation,
particle immobilisation, perception*

Plants are supposed to mitigate negative impacts of urban environment on public health. Despite being understudied so far, non-woody road side vegetation could provide regulating ecosystem services by immobilising traffic-born particles in the immediate vicinity of people. It is an open question, however, whether urban residents appreciate spontaneous road side vegetation. This study aims at linking regulating and cultural ecosystem services of road side vegetation. We (1) review ecosystem services of road side vegetation, (2) assess the deposition of traffic-born particles on leaves of road side species with different morphologies and (3) explore how residents perceive spontaneous road side vegetation. We analysed the species composition and the representation of leaf traits (leaf area, surface roughness, presence of hairs or glands) at 12 sites in Berlin, exposed to different densities of traffic. We then evaluated the suitability of several methods for quantifying particle deposition on leaves. Finally, we explored by questionnaires how city dwellers perceive

spontaneous road side vegetation. The review reveals that roadside vegetation can deliver a range of ecosystem services. First results of the field study show that an array of species and leaf morphologies is represented along road verges. The methodological comparison showed that optical approaches (microphotography, microscopy) are more suitable than washing or stripping for analysing particle deposition on leaves. First results of the perception study suggest that city dwellers are aware of many functions of road side vegetation (aesthetic qualities, cleaning air services, human wellbeing).

Differing understandings of city nature and their impact on the
decision-making in urban development.
The case of temporary uses in Berlin

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Keywords: Understanding of nature, urban nature, temporary uses, Berlin

In urban areas, nature is assessed in many different ways. Although the understandings of what is considered as 'nature' are often not made explicit, they have an influence on the decision-making in urban development. In the case of temporary uses of vacant lots, understandings of nature on the part of stakeholders of urban planning, property owners and members of civil society often collide.

Following a constructivist perspective on urban nature, our research project examines the significance of differing understandings of nature in the discourse about a specific use of land. What is the role of nature in the arguments of the respective stakeholders? Which interests are pursued with which (underlying) ideas of nature? What is the impact that different concepts of nature have on the particular use that is negotiated?

In order to make out the different representations of nature that emerge in the negotiations between different

stakeholders, temporary uses of three open spaces in Berlin are examined by using qualitative interviews and participant observation.

Following an initial heuristic classification, the ways of reasoning which have been identified so far can be assigned to three different representations of city nature:

1) *The useful nature* refers to concrete benefits for the urban society and not to intrinsic values as reasons for the existence and maintenance of nature.

2) *The beautiful nature* oscillates between a gardened and a wild, untamed urban nature.

3) *The sensitive nature* is located between a needy and thus worth-to-be-protected nature, on the one hand, and urban nature as resource as base for its protection, on the other hand.

Congress Excursions

Excursion 1

TAKE OFF — TEMPELHOF: dynamics of urban airports without planes

After its closure in October 2008, Tempelhof Airport has become a new space for cultural events, concerts, fashion shows and more. Its spacious grounds and former landing strips have been opened to the public as a park and place for informal sports, temporary gardens and other recreational activities. First ideas for a new city quarter and huge landscape park have been proposed and developed. The tour inside of the building reveals the potential of this fantastic estate and the spatial qualities of the listed historic monument.

Date: 10/24/2010

Time: 10-13h

Meeting point: Main entrance „Platz der Luftbrücke“
12101 Berlin

Public Transport: Subway U6, Platz der Luftbrücke Station

Guide: Christian Hajer, urban and land-use planner

Contact Person: Martina Koch (Mobile: +49-173-6096721)



POTSDAMER PLATZ: urban water management for an inner city area

The DaimlerChrysler-Project at Potsdamer Platz in Berlin (from 1996-1998 the largest construction site in Europe) was built under very strict stormwater management regulations. In order to avoid overloading the existing combined sewerage system in central Berlin, the building permit issued by the city stated that the new complex could drain runoff at a rate of no more than 3 l/ sec/ ha, or 1% of flows during storm events. To comply with this regulation, the Atelier Dreiseitl (www.dreiseitl.de) and landscape architect Daniel Roehr implemented innovative management techniques for the 23.000 m³ building site: 1.) Extensive and intensive green roofs on all 19 buildings, 2.) collection of rooftop storm water runoff for toilet flushing and plant irrigation, and 3.) an artificial lake for rainwater retention and evaporation. Three cisterns provide 2550 m³ storage capacity that corresponds directly to 12% of the annual precipitation of the catchment area. Covering a total area of 13,000 m², the artificial lake can fluctuate its levels by 30 cm, which corresponds to an additional storage capacity of 11% of the annual precipitation. The water is cleaned and filtered through artificial filtering systems and additionally by a constructed wetland of 1900 m². In operation for over ten years, the facility merges recreational, aesthetic, ecological and functional qualities in Berlin's urban center.

- Date:** 10/24/2010
- Time:** 10-13h
- Meeting point:** Marlene Dietrich Platz 1, 10785 Berlin,
in front of casino and bridge over urban
water
- Public Transport:** Bahn station: „Potsdamer Platz“ S1, S2 or S25,
U-Bahn station: „Potsdamer Platz“ or
“Mendelssohn-Bartholdy-Park“ U2,
Bus stop: „Varian-Frey-Straße“ Bus-line 148,
200, 248 und 348
- Guide:** Marco Schmidt, Department of Architecture,
Technical University of Berlin
- Contact Person:** Yong-Nam Rim (Mobile: +49-163-6848-717)



Exhibition: The Art of Urban Ecology

Exhibition: The Art of Urban Ecology

Concept and Curation: Jasmin Honold & Alex Toland

As urban ecology researchers we aim for a more holistic system of knowledge beyond individual disciplines and isolated fields of inquiry. In order to adequately address the complex challenges of city life, diverse dialog is necessary. Within our multidisciplinary research program we have been enriching our own scientific perspectives by learning how other disciplines approach urban ecology, name it, research it, discover it and communicate it.

While scientific research provides lawmakers and public stakeholders with quantitative and qualitative analyses and expert prognoses, art plays a vital role in communicating environmental issues to the greater public. Because art is a free, experimental format where ideas can be independently and critically tested before ending up in mainstream culture, art can be seen as an indicator of shifts in cultural values or norms. If we consider art not only as cultural indicator but also an instrument, which can be integrated into public space and urban culture, we can regard art as a resource or service of environmental communication and conservation.

Beyond it's communicative interface to the general public, we might also ask, what can art contribute to „state of the art“ urban environmental research? In addition to the oral and poster sessions, we are curating an ad-hoc documentary-style exhibition of works and artist statements to be displayed in the same hall as the scientific posters. The idea is to present

current artistic research on ecological matters on the same level of credibility and integrity as fundamental scientific research.

The selected works represent just a few examples of how art contributes to the holistic vision of urban ecology. They capture aesthetic moments of city life but also document creative confrontation with issues such as land-scape degradation, urban agriculture, land-use change and environmental justice. The exhibition includes, among others, works from the artists Lillian Ball, Amy Franceschini, Sébastien Michaud, Andrea Polli, Aviva Rahmani, and a collaborative work of interaction designer Myriel Milicevic and Grako researcher and artist Alex Toland. A full documentation of artist statements will be available during the exhibition and poster session.

Exhibition film: Ground Truth

Directed by Andrea Polli



"I am delighted to see the discussion around 'ground truth' as it connects to a subject that I am passionate about – how to make 'intimate' the data we get from instruments." Roger Malina, *The Leonardo Journal of Art, Science and Technology*

For almost 100 years, throughout the world from Antarctica to Greenland to the middle of the Pacific Ocean, people have been stationed in remote, uncomfortable and sometimes hazardous locations for the sole reason of physically observing and recording the weather. Meteorologists, military and commercial pilots, air traffic controllers, and many others depend on this regular information, what they call 'ground truth', despite the ubiquity of instruments that can provide precise and often much more detailed information without endangering human lives. Why, with all this sophisticated sensing instrumentation and satellite imagery, do we still depend on people on the ground looking up at the clouds? What is the meaning of 'ground truth'?

The film *Ground Truth* attempts to answer these questions by following weather observers at the South Pole Station, McMurdo Station, and weather and climate scientists as they

maintain and gather data from instruments at field sites on the Ross Ice Shelf and the Dry Valleys of Antarctica. Ground Truth examines global climate change, human presence in these extreme environments and the inexorable connection between human life and the earth's natural cycles.

Directed by Andrea Polli

Videography and sound by Andrea Polli and Tia Kramer

Post-Production by Brandon Lied, Greg O'Brien, Leslie Lavelanet, Linda Post and Andrea Polli

Transcripts and graphics by Klew Williams and Andrea Polli

Running time 00:12:37

Starring

Dr. Andreas Fischlin, Dr. Wolfgang Rack, Dr. Adam Lewis and Dr. Peter Doran, Hassan Basagic and Dr. Andrew Fountain, The Dry Valleys Long Term Ecological Research Group and Portland State University, Dr. John Cassano, The University of Colorado, Boulder, Victoria Sankovic, Katie Koster, Jeff DeRosa and Jonathan Tham

Supported by The National Science Foundation Antarctic Artists and Writers Program, The University of Colorado, Boulder Center for Humanities and the Arts, Department of Art and Art History, ATLAS Institute and Undergraduate Research Opportunities Program and the PSC-CUNY Research Foundation

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1) Mensa HU Oase Adlershof

Rudower Chaussee 25 (Haus 2)

Opening hours: Friday 11.00 -14.30

Cafeteria: Friday 08.00 - 16.00

(Mensa card is not obligatory)

2) Adlershofer Betriebsrestaurant

Rudower Chaussee 19

Opening hours: Friday 07:30 - 16:00

Lunch from 11:00 -14:30

(about five main dishes – at least one vegetarian; soup, salad bar, etc.)

3) TIM's Canadian Deli Adlershof

Erwin Schrödinger - Zentrum

Rudower Chaussee 26

Opening hours: Friday 09:00 - 18:00

(Canadian pastries, soup, hot food, bagels, salad, etc.)

4) Bistro Sonnenschein

Volmerstraße 7b

Opening hours: Friday 11.00 –15.00

(three main dishes - one vegetarian; soup, salad, etc.)

5) Jouis Nour

Rudower Chaussee 14

Opening hours: Friday 11.30 - 14.00

(organic German food, about five main dishes, vegetarian food available)

6) Dorint Hotel

Rudower Chaussee 15

Restaurant Olivenbaum

Friday: 06:30 - 23:00

Weekend: 07:00 - 23:00

breakfast (€ 13,00): 06.30 - 10.30 (weekend 11.00)

lunch and dinner à la carte

Bar every day: 10:00 - 01:00

7) In the shopping center “Kaufland”:

Rudower Chaussee 12

One bakery and two snack bars (with hot lunch options)

Opening hours: Friday and Saturday from 7.00 - 22.00

Furthermore at the Rudower Chaussee:

8) Subway

Opening hours:

Friday 7:00 -22:00

Saturday 9:00 -22:00

Sunday 10:00 -22:00

9) Bagel Company

Opening hours:

Friday 7:30 - 20:00

Saturday 12:00 - 20:00

Sunday 10:00 - 18:00

This is only a selection – there are a lot of other options in Adlershof.

More information:

<http://www.adlershof.de/speisekarten/>



Space for your new perspectives

Program

Friday, October 22, 2010

08:00	Registration
09:00 – 09:15	Greeting and opening statements by graduate programme chair Prof. Dr. Wilfried Endlicher

Session 1: Sustainable Planning and Policy

09:15 – 10:00	Jürgen Breuste (Keynote), Austria
10:00 – 10:20	Juliane Mathey and Stefanie Rößler, Germany
10:20 – 10:40	Marco Voltini, Italy
10:40 – 11:00	Coffee break
11:00 – 11:20	Miguel A. Martínez López and Elisabeth Lorenzi Fernández, Spain
11:20 – 11:40	Joëlle Salomon Cavin, Switzerland
11:40 – 12:00	Braulio Eduardo Morera, UK
12:00 – 13:30	Lunch

Session 2: Urban Biodiversity

13:30 – 14:15	John Marzluff (Keynote), USA
14:15 – 14:35	Barbara Clucas, USA
14:35 – 15:00	Coffee break
15:00 – 15:20	Götz Heinrich Loos, Germany
15:20 – 15:40	Sonja Knapp, Germany
15:40 – 16:00	Christopher David Ives, Australia
16:00 – 16:30	Coffee break
16:30 – 18:00	Poster session and exhibition: The Art of Urban Ecology
18:00	Dinner reception

Saturday, October 23, 2010

08:15 Registration

Session 3: Environmental Media

09:15 – 10:00 **Michael Bruse (Keynote), Germany**
10:00 – 10:20 Sabine Wurzler, Germany
10:20 – 10:40 Ulrike Weiland, Germany
10:40 – 11:00 Fred Meier, Germany
11:00 – 11:20 Phillip Starke, Germany
11:20 – 11:45 **Coffee break**

Session 4: Theory, Methods and Practice

11:45 – 12:30 **Wulf Tessin (Keynote), Germany**
12:30 – 12:50 Phillipe Clergeau, France
12:50 – 13:10 Undine Giseke, Germany
13:10 – 15:00 **Lunch**
15:00 – 15:20 Paolo Cascone, Andra Di Stefano, France
15:20 – 15:40 Jinliao He, Germany
15:40 – 16:00 Amir Bahramipanah, Italy
16:00 – 16:15 **Coffee break**

Session 5: Perception and Behaviour

16:15 – 17:00 **Frances E. Kuo (Keynote), USA**
17:00 – 17:20 Robbert Snep, Netherlands
17:20 – 17:40 Katrin Großmann, Germany
17:40 – 18:00 **Coffee break**
18:00 – 18:20 Ioana Florea, Romania
18:20 – 18:40 Jens Martin Gurr, Martin Butler,
Germany
18:40 – 19:00 Dieter Rink, Thomas Arndt, Germany
19:00 – 19:20 **Conclusions and perspectives by
graduate programme associate chair
Prof. Dr. Ingo Kowarik**
19:20 **Closing**