

Soundscape – a new hotspot in landscape research

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Rachel Louise Carson
geb. 1907 – gest. 1964

“Silent Spring“ (1962)

Impetus for the foundation of the Environmental Protection
Agency 1970, EIA 1969

The World Soundscape Project – Simon Fraser University (Start about 1970)

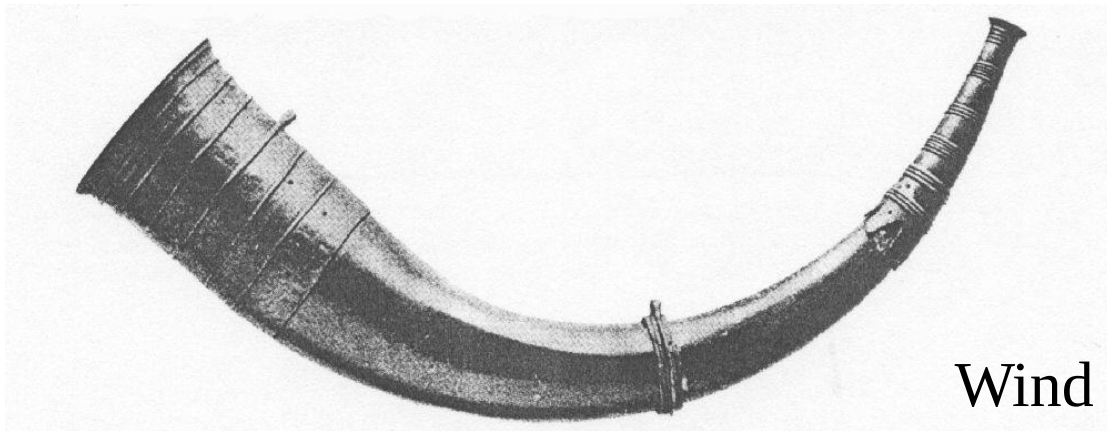


And a regional example from North-East Germany

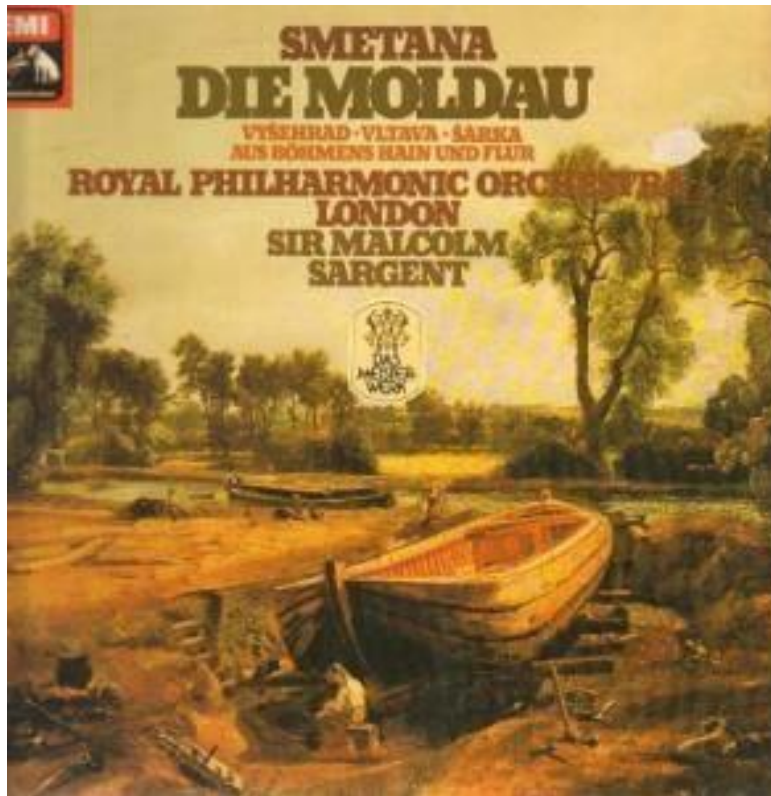
...an ethnomusicological exploration of sounds which in some way define the city and its suburbs. Based on soundscape theories developed by Raymond Murray Schafer, and based at the Hochschule für Musik und Theater (HMT) Rostock, the project is led by ethnomusicologists Barbara Alge and Frances Wilkins in collaboration with students and staff at the HMT and the University of Technology, Business and Design Wismar.”



Palaeolithic Bone Flute



Wind Instrument /Bronze Age)



BEDŘICH SMETANA : „VLTAVA“ – an impressive symphonic work on the longest river in the Czech Republic.



Laubfrosch
(**Hyla arborea**)



Wechselkröte
(**Bufo viridis**)

Rohrdommel
(**Botaurus stellaris**)





Eichelhäher (*Garrulus glandarius*) – The acoustic guard in German woods.

Soundscape refers to the full range of perceptible sounds at a given time period in a given landscape and the way humans respond to these acoustical cues that contribute significantly to the characteristics of a landscape.

Soundscape has been defined by the International Organization for Standardization (2014) as “acoustic environment as perceived or experienced and/or understood by a person or people ...”.

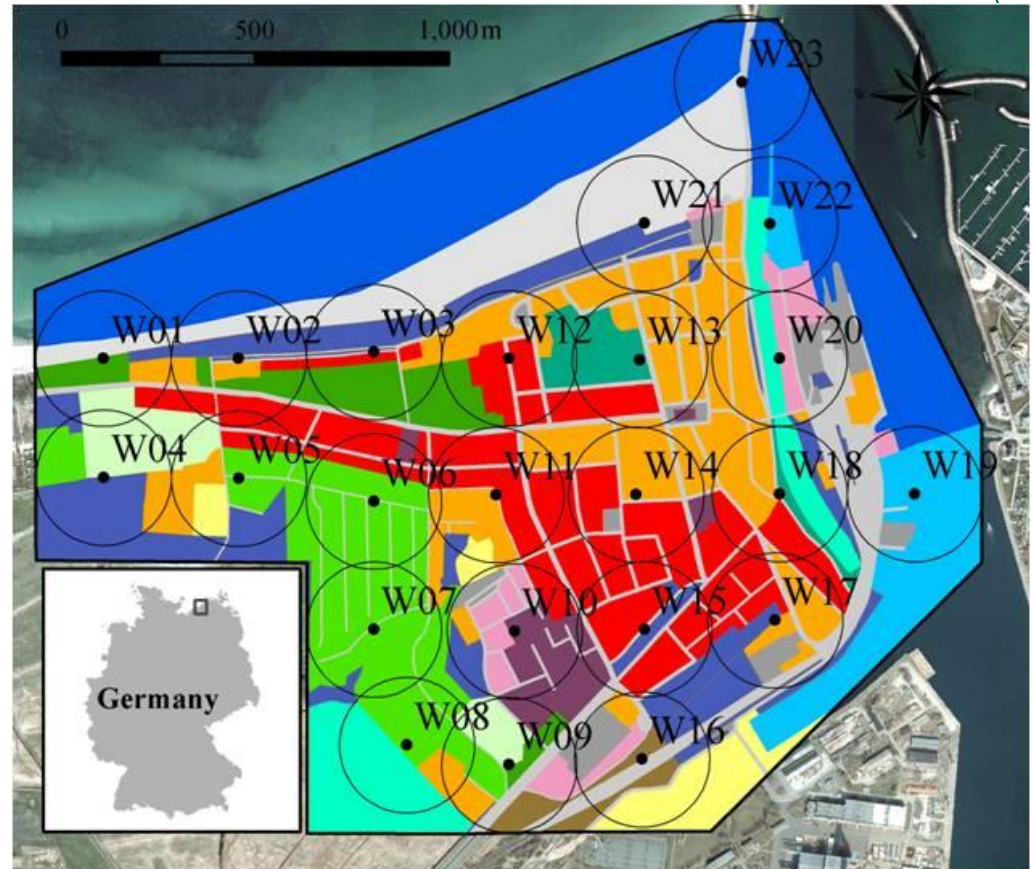
Case study 1

- Location
 - Rostock, Germany
- Soundscape data
 - Daily soundscape
 - 27 sound sources
 - 12 observers
 - 23 sampled sites
 - 8 sampled periods
 - 10 min recording
 - 20 time-steps
 - Loudness, preference



Case study 1

- Landscape composition
 - Construction density (CD)
 - Road density (RD)
 - Vegetation density (NDVI)
 - Patch density (PD)
 - Largest patch index (LPI)
 - Simpson's evenness (SIEI)
- Landscape configuration
 - Landscape shape index (LSI)
 - Contagion (CONT)
 - Fractal dimension (FRAC)

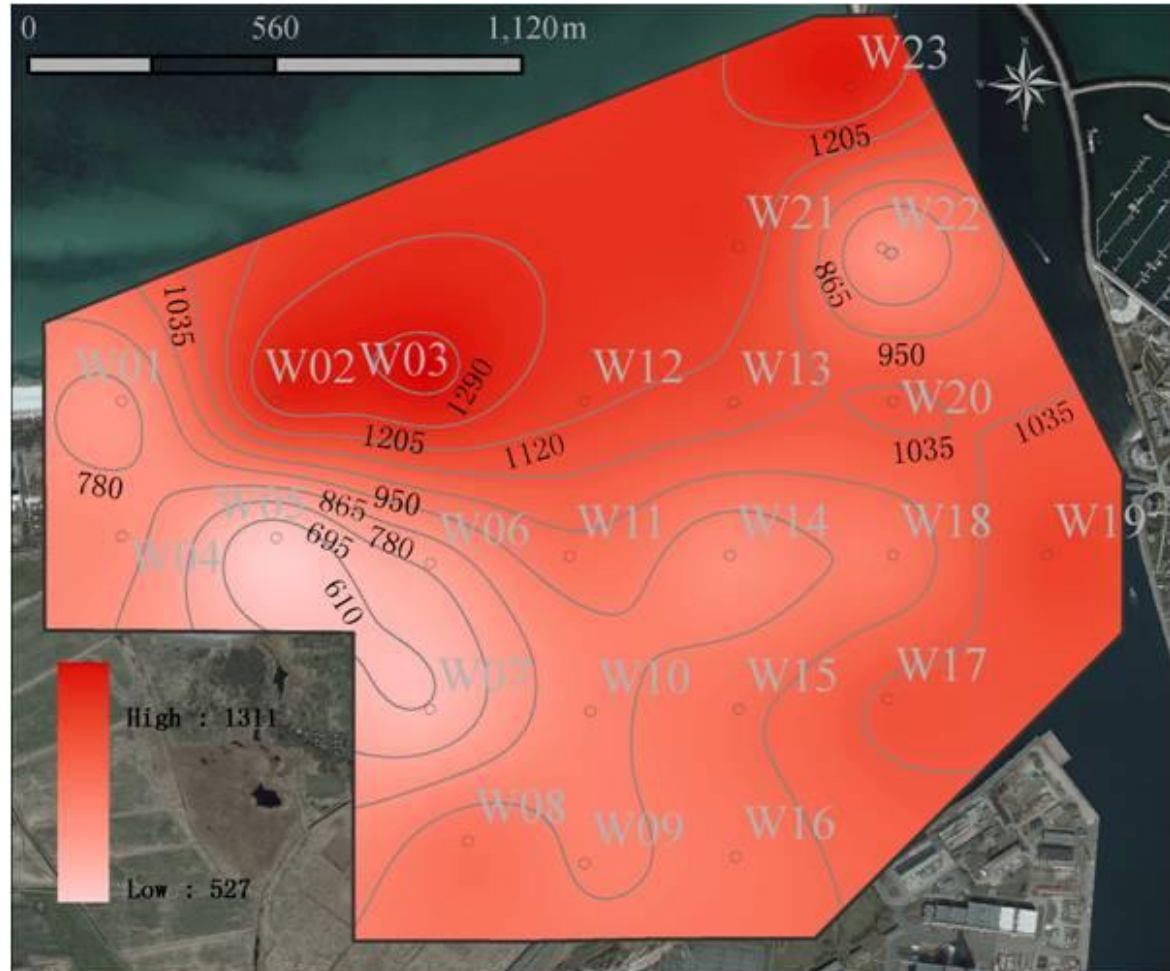


Case study 1

Soundscape maps

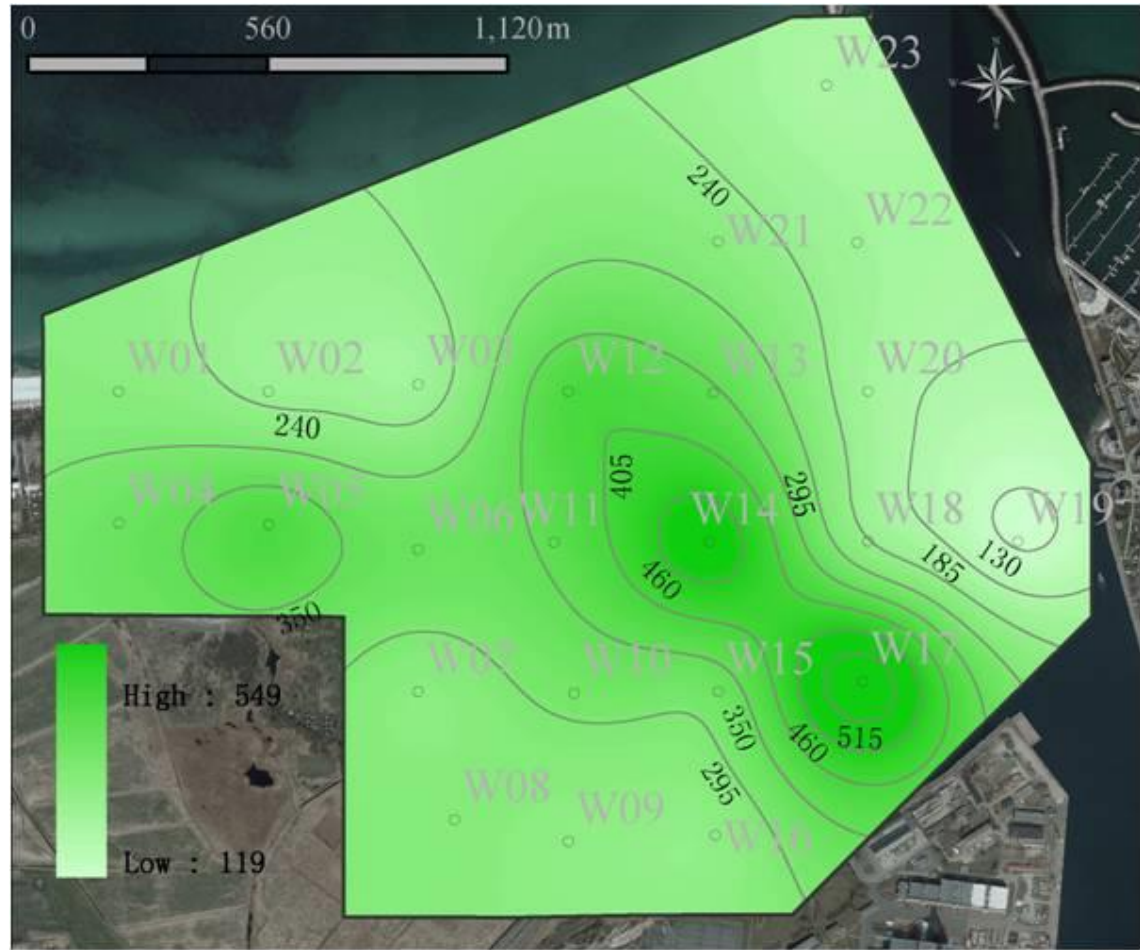
- Interpolation in software
- 3 main soundscape elements (anthropogenic, biological and geophysical sounds)
- Daily accumulated loudness
- Spatiotemporal patterns

Case study 1



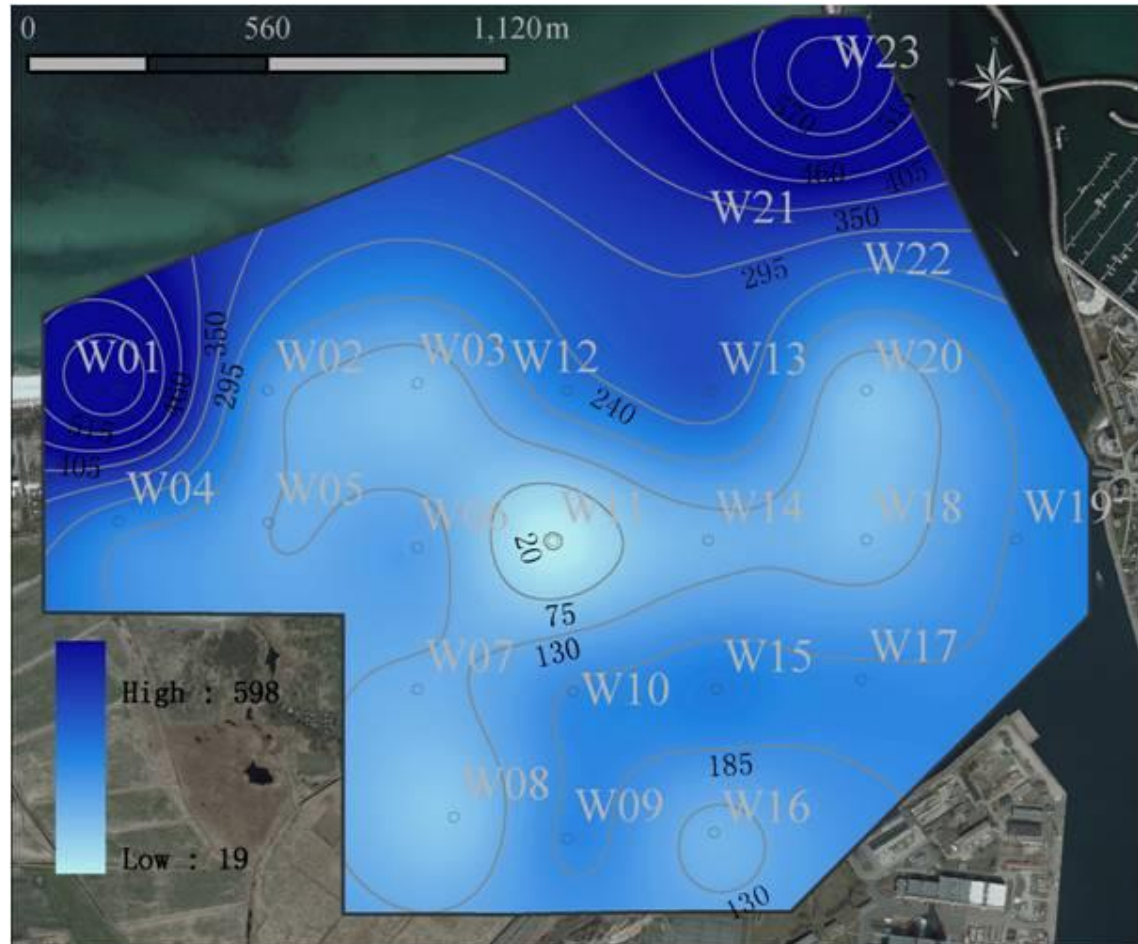
Anthropogenic sound

Case study 1



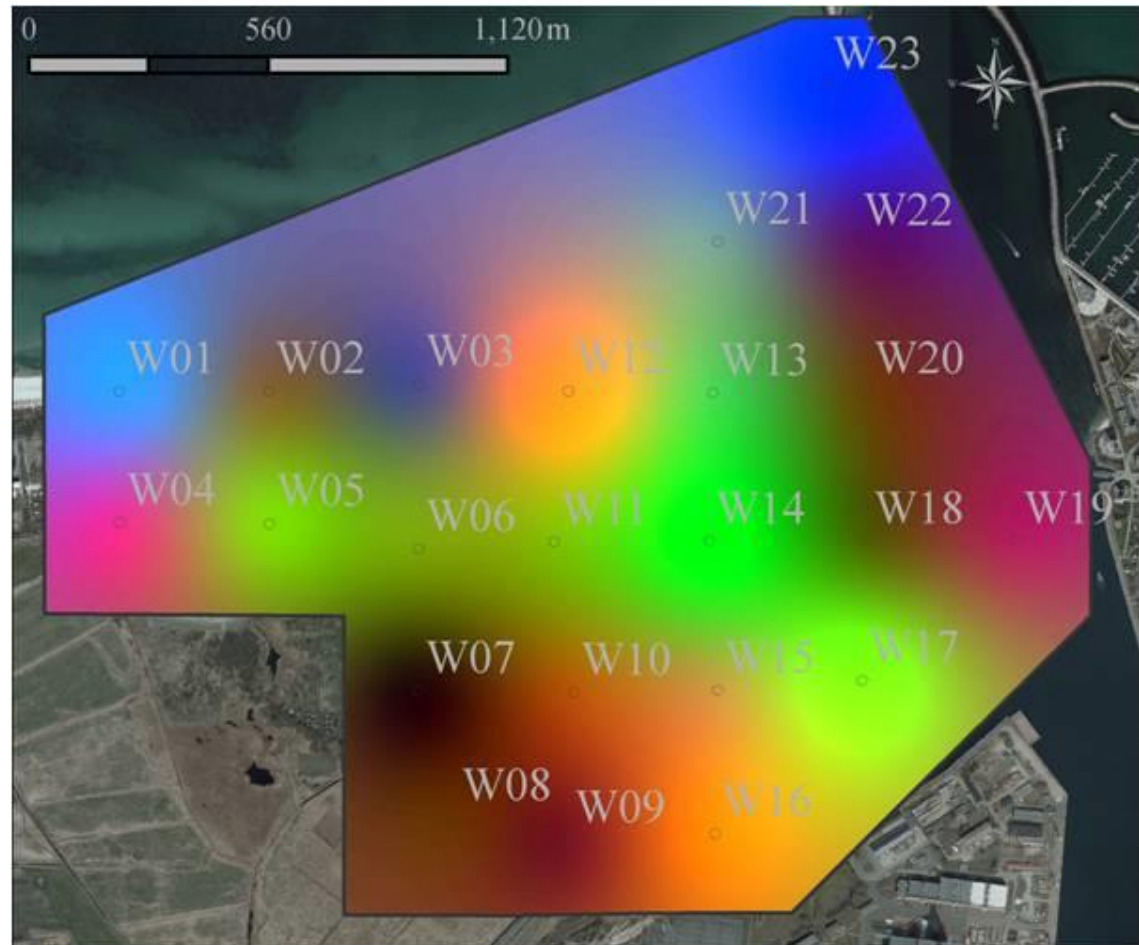
Biological sound

Case study 1



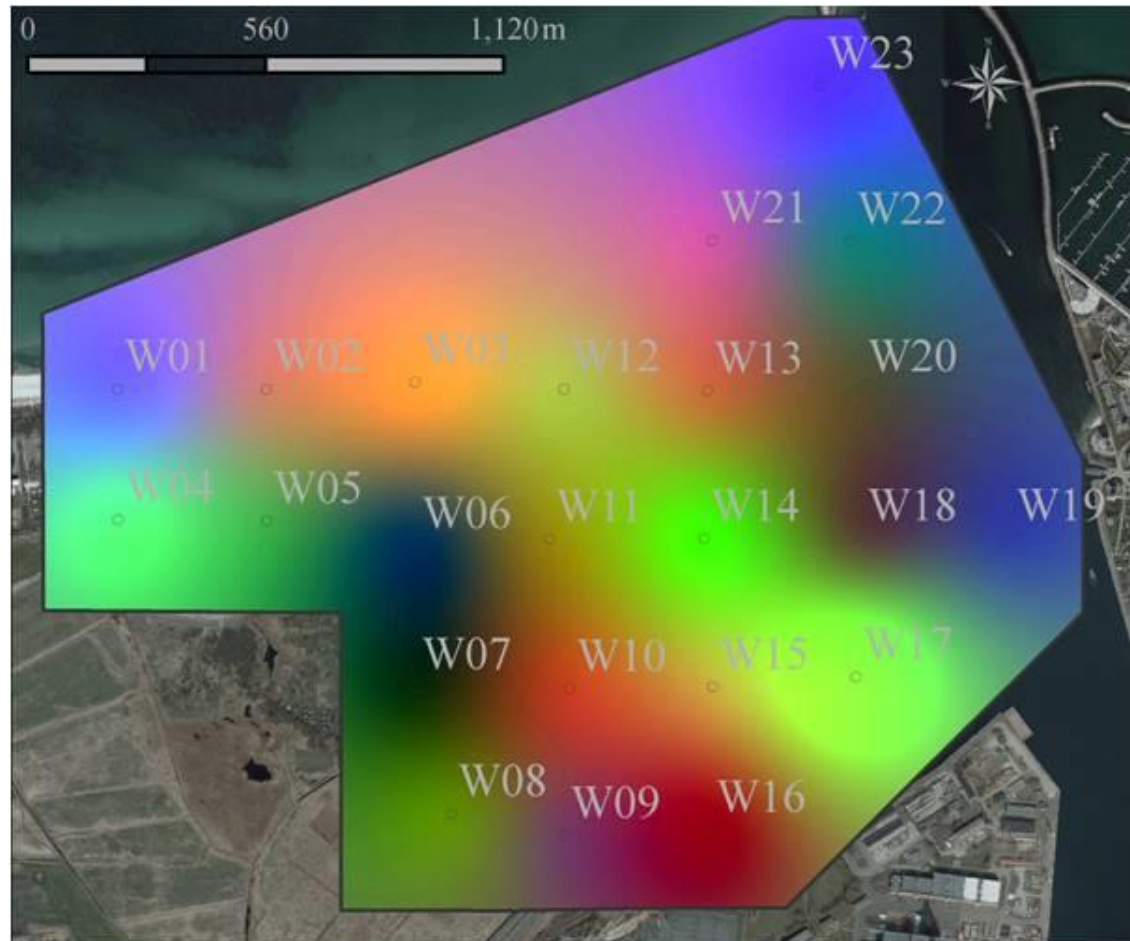
Geophysical sound

Case study 1



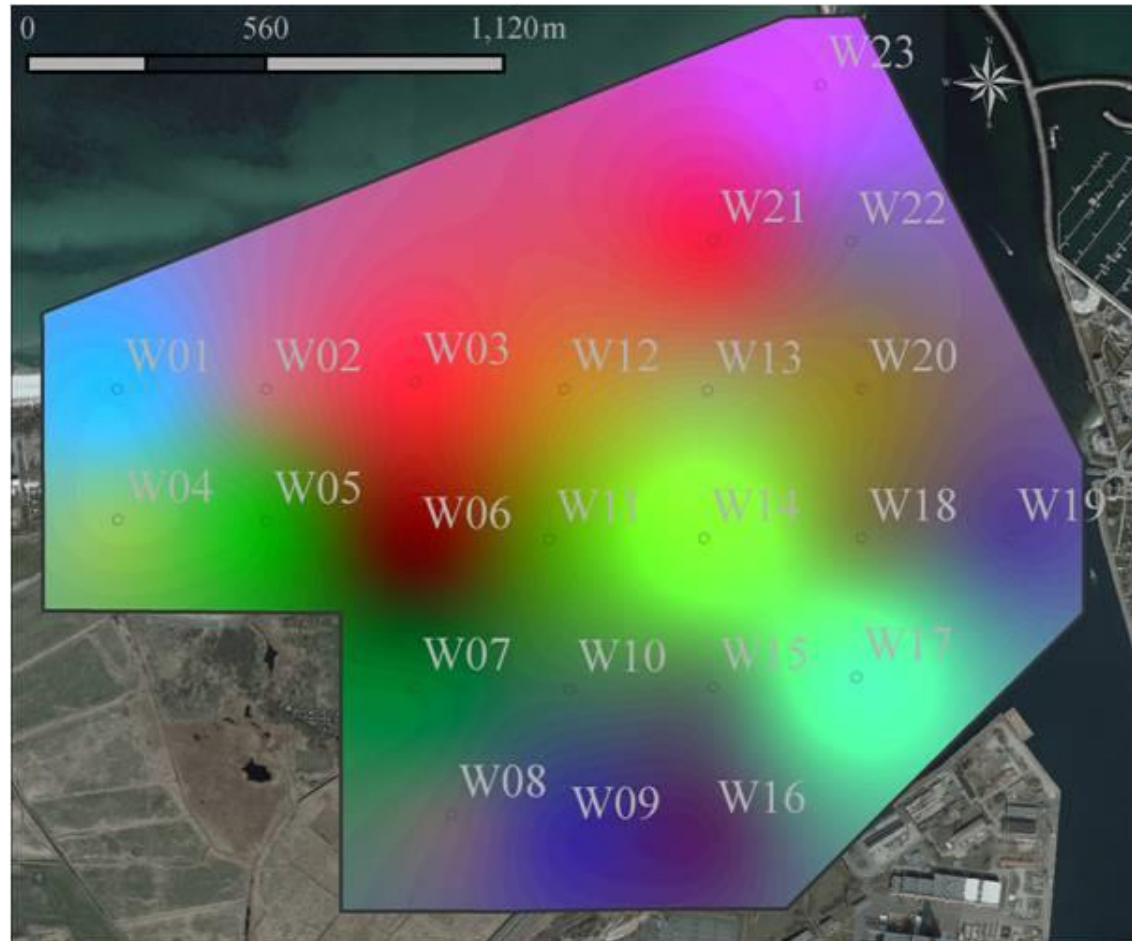
1st Period: 06:00–08:00

Case study 1



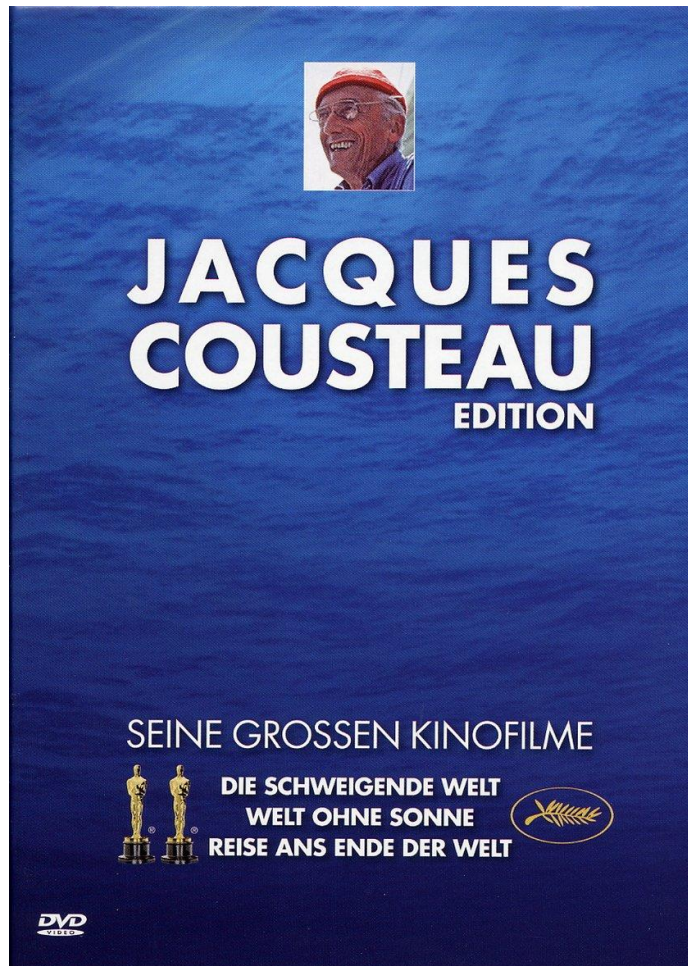
2nd period: 08:00–10:00

Case study 1



3rd period: 10:00–12:00

Landscape characteristics	Indices	Positive	Negative
Vegetation	Vegetation density (NDVI)	Biological sound, Traffic sound	Human sound, Mechanical sound, Geophysical sound
Construction	Construction density (CD)	Biological sound, Traffic sound	Geophysical sound
Road	Road density (RD)	Traffic sound	—
Land use scale	Largest patch index (LPI)	Human sound, Mechanical sound	Biological sound, Traffic sound
Land use shape	Landscape shape index (LSI), FRAC	Traffic sound	Human sound, Geophysical sound
Land use composition	Simpson's evenness (SIEI)	Biological sound, Traffic sound	—
Land use distribution	Contagion (CONT)	—	Biological sound, Traffic sound



„The Silent World “ (1957)

Jacques Cousteau - one of the most famous ocean explorers.

Soundscapes and the sea?



An artificial curtain of bubbles at pile work and explosions should protect animals and divers.

Urban noise

Noise and its impact on human health and well-being is one of the inevitable consequences of densification of human agglomeration and activities. Exposure of people to excessive noise levels is then a challenge, becoming a growing environmental concern (Soares & Coelho, 2016).

Important institutions, such as World Health Organization (WHO) and Organization for Economic Co-operation and Development (OECD) consider urban noise as an indicator of urban environmental quality.

Urban noise was included in the list of the most environmental priority topics for research.

One of the most important demographic facts of today's world is the increasing proportion of people living in urban areas. By the end of 2013, over 51 per cent of the global population was living in urban areas; by 2050, this proportion is expected to increase to 70 per cent (UN-Habitat, 2008:5).

Today many cities start to think about their soundscape. It is a long way from the „Clamosa urbs“ to a “smart” or “green” City - Soundscape belongs to it.



... earphones and reality in the cities ...

Case study 2

- Location
 - Xiamen, China
 - 5 city parks
 - 580 questionnaires











Case study 2

- Visual landscape has more effects on perceived occurrences of natural sounds.
- Functional landscape has more effects on preferences for artificial sounds.
- Landscape factors significantly affect the overall soundscape preference.



an





Case Study: Perception of soundscape and coastal management in Brazil



In cooperation with the
University of Campinas.

National Park “Serra do Mar”

The largest protected area of the biome “Atlantic Forest” (3.320 km²)

It belongs to the National System of Conservation Units (SNUC).



Some considerations

Understanding how people perceive the landscape is an important step for planning. If people are attached to a place they usually develop a sense of responsibility for that place, and care for nature and the landscape.

The knowledge of people's landscape perception is necessary to design places where people feel attached to, and where they can establish a sense of place identity.

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