



AFTER

BEFORE

Country / City	Poland , Kielce
University / School	Kielce University of Technology
Academic year	2019/2020
Title of the project	„Wetlandpunctures”
Authors	Dominika Kryczka, Hanna Savchenko, Dawid Zemsta, Monika Wojcicka



TECHNICAL DOSSIER

Title of the project	Wetlandpunctures
Authors	Dominika Kryczka, Hanna Savchenko, Dawid Zemsta, Monika Wójcicka
Title of the course	Landscape Architecture
Academic year	2019/2020
Teaching Staff	Dr Magdalena Wojnowska-Heciak , Land. Arch.
Department/Section/Program of belonging	Department of Civil Engineering and Architecture , Architecture
University/School	Kielce University of Technology



Written statement, short description of the project in English, no more than 250 words

The project entitled Wetlandpunctures is a direct response to the problem of too intensive landscape transformation in the region of Murcia, Spain which combined with the climate change contributes to the degradation of Mar Menor lagoon and the decreases the quality of tourist cities located at the coastline. Fertilizers flowing from the fields into the lagoon are the main reasons for the sea dying. Murcia is one of the leading vegetables and fruit manufacturer in Europe, and only mutually supportive functioning of the rural and urban landscape can guarantee the future for Murcia.

The main aim of the project is to decrease surface water flow by wetland restoration. The wetlands existed in the region a few decades ago mitigating floods. The new strategy is based on water excess accumulation and purification performed by wetlands naturally. The study area is divided into three zones. In the first one, all forms of intensive agriculture are replaced by vertical farms with closed water circulation and rainwater recycling from the urban area to be used in rural suburbs. In the second zone, bio agriculture – Hugelkultur is promoted. In the third zone, each field is surrounded by trees planted along the plots borders, rainwater retention ponds located in the lowest part of the field and the perpendicular to the surface water flow drainage systems. The combination of three different approaches is the response to climate change and landscape challenges. Natural landscape - wetlands are the safest solution to ensure the future for Murcia.

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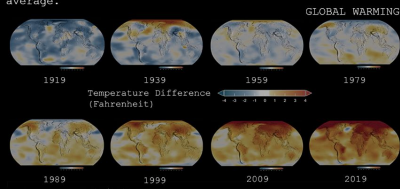
CLIMATE CHANGE AGAIN

11th International Biennial Landscape Barcelona

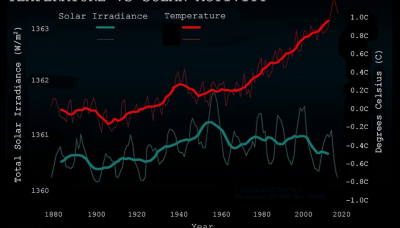
Barcelona September 2020
SCHOOL PRIZE

GLOBAL SITUATION

This color-coded map shows a progression of changing global surface temperatures since 1884. Dark blue indicates areas cooler than average. Dark red indicates areas warmer than average.

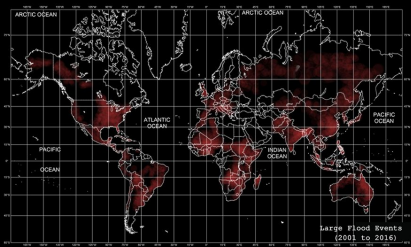


TEMPERATURE VS SOLAR ACTIVITY



FLOODING

This world map shows the areas affected by large flood events occurring between 2001 and June 2016. Areas with multiple overlapping events are in intense red. The data are from C. R. Brakenridge, "Global Active Archive of Large Flood Events", Dartmouth Flood Observatory, University of Colorado



FLOODS DOMINATING CASES OF NATURAL DISASTERS SINCE 1980

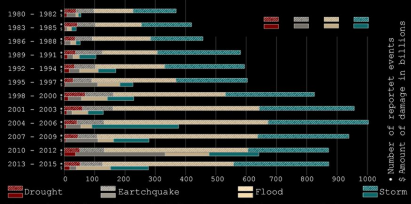
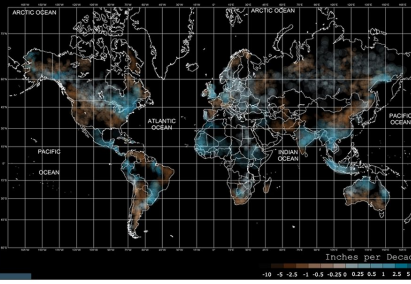


Figure 1: Number of reported disasters and the amount of damages

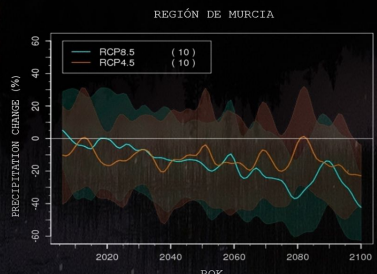
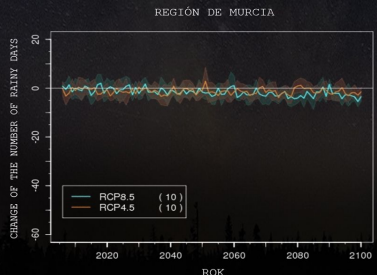
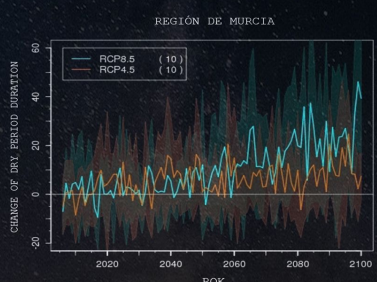
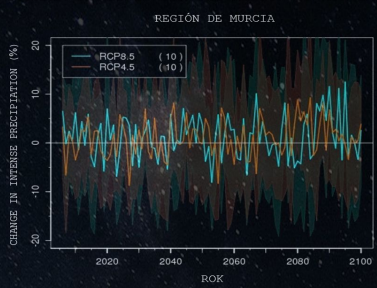
Data Sources: World Risk Report 2016 published by the United Nations University (UNU) Institute for Environment and Human Security (UNU-EHS)

ANNUAL PRECIPITATION TRENDS: PAST 30+ YEARS

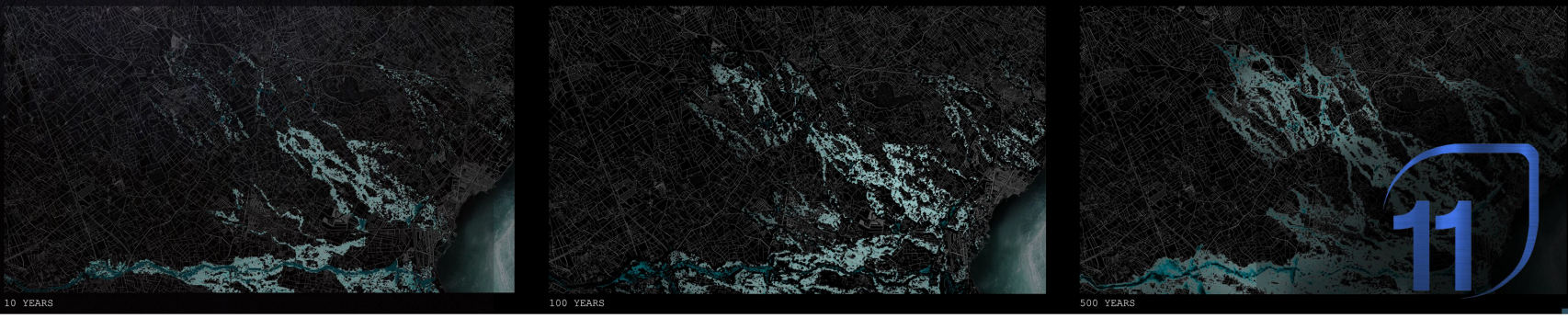
More than 480 people in India have died in flood-related incidents since the beginning of monsoon in June. Of the top 15 countries that are most at risk worldwide, eight are island nations. Their high disaster risk is due to their exposure to flooding, cyclones and sea level rise. Apart from lack of technologies for prognosis on tsunamis and floods, the living conditions of the people in the affected regions and options available to respond quickly are equally significant for survival in extreme natural events.



DYNAMIC ANALYSIS FOR THE REGION OF MURCIA



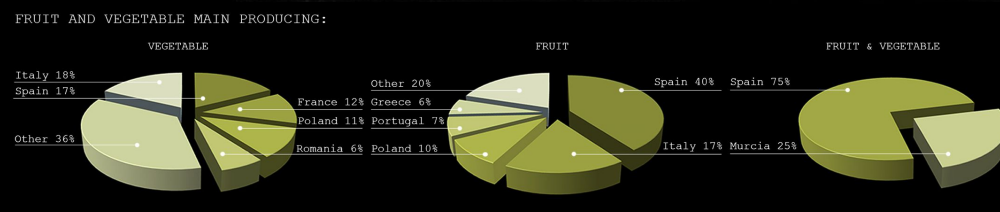
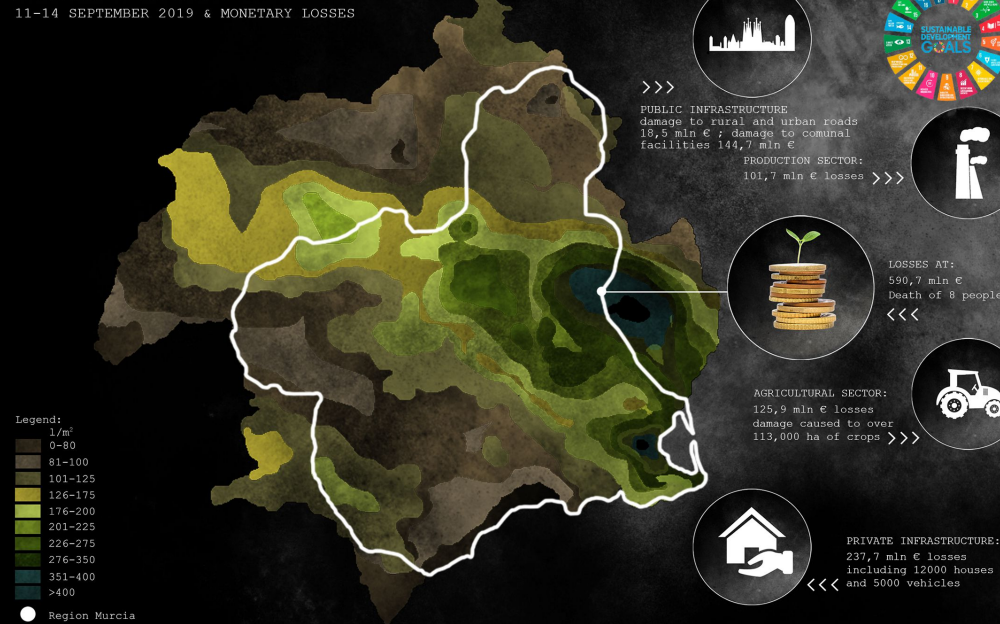
THE LEVEL OF WATER ACCUMULATION DURING FLOODS



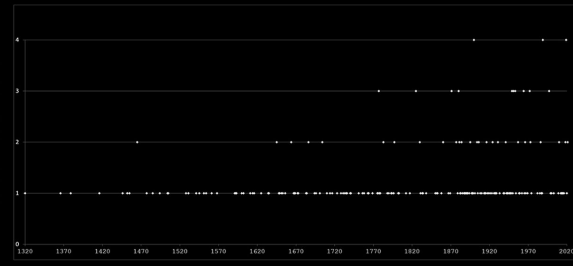
NEGATIVE EFFECTS OF A FLOOD

- FLOODING
- ECONOMICAL LOSS
- INCREASING OF THE AMOUNT OF ALGAE
- BAD SMELL
- NATURAL IMPACT (dying fish)
- DECLINE IN A FIELD OF TOURISM
- CROP LOSS
- HERITAGE IN DANGER

PRECIPITATION FOR MURCIA 11-14 SEPTEMBER 2019 & MONETARY LOSSES



FLOODING -REGIÓN DE MURCIA

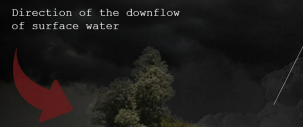


COMPARISON TABLE 2019 VS 2020

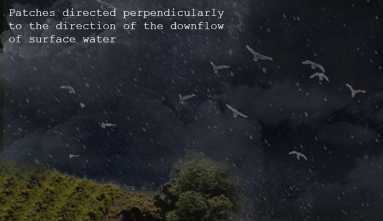
Parameter	2020	Value 2019	Value	
Clarity (m)	12 feb	2,86	14 feb	4,75
	01 feb	3,01	06 feb	4,01
	13 jan	3,20	17 jan	5,17
Turbidity (FTU)	05 mar	4,80	05 mar	1,08
	25 feb	2,76	26 feb	1,18
	20 feb	2,38	20 feb	1,05
Chlorophyll level (mg/l)	05 mar	10,50	05 mar	0,29
	25 feb	3,97	26 feb	0,20
	20 feb	4,17	20 feb	1,05
Temperature (°C)	05 mar	16,47	05 mar	15,75
	25 feb	15,16	26 feb	14,15
	20 feb	15,41	20 feb	13,35
Salinity value (PSU)	05 mar	38,85	05 mar	43,39
	25 feb	39,70	26 feb	43,34
	20 feb	39,61	20 feb	43,45
Oxygen level (mg/l)	05 mar	8,05	05 mar	7,55
	25 feb	7,46	26 feb	7,66
	20 feb	7,06	20 feb	7,64



FIELDS (F)



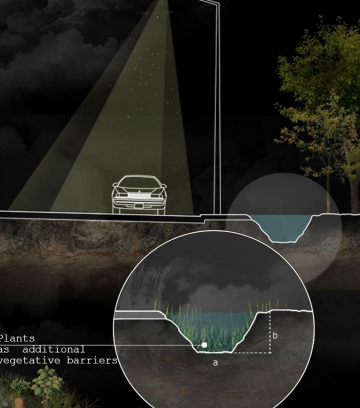
ROADSIDE DITCH (RD)



ROADS AND GREEN BELTS DIVIDED INTO ZONES



VERTICAL AGRICULTURE (VA)



HUGELKULTUR (H)



- Fast Growth
- No Weeds
- No Soil
- Water Saving
- No pesticides
- Less diseases

ADVANTAGES OF PLANTING SELECTED CROPS IN THE RAVINES

- Adequate soil moisture in the fields
- Undemanding plants
- Resistant to winds and heat
- Decorating plants
- High biodiversity
- Drought resistant
- Improving the microclimate
- Storage for excess water

SELECTION OF PLANTS FOR THE RAVINE

- LEVANDULA SSP.
- PISTACIA LENTISCUS
- THYMUS VULGARIS
- ULMUS MINOR
- SALVIA OFFICINALIS
- ECHIUM SSP.

RAVINE (R)

Small storage reservoir
 Planting trees perpendicularly to the direction of the downflow of surface water for both sides of the territory

Ravine - a kind of dry valley with a flat bottom and steep slopes. It is formed through the transformation of the gorge and its greening. Fills with water after intense rainfalls. Existing stream have been additionally enriched with selected vegetation, contributing to the purification of accumulated water.



HUGELKULTUR (H)



ROADS AND GREEN BELTS DIVIDED INTO ZONES

