



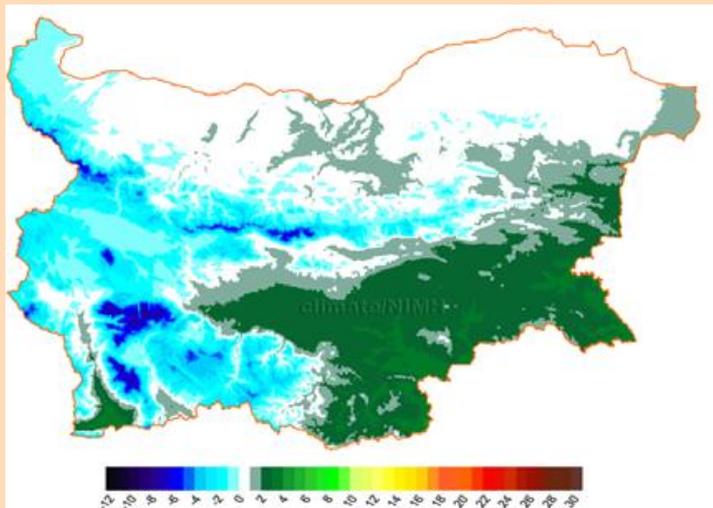
REGIOCLIMA

REGIOCLIMA PROJECT REGIONAL COOPERATION TOWARDS ADAPTATION TO CLIMATE CHANGE

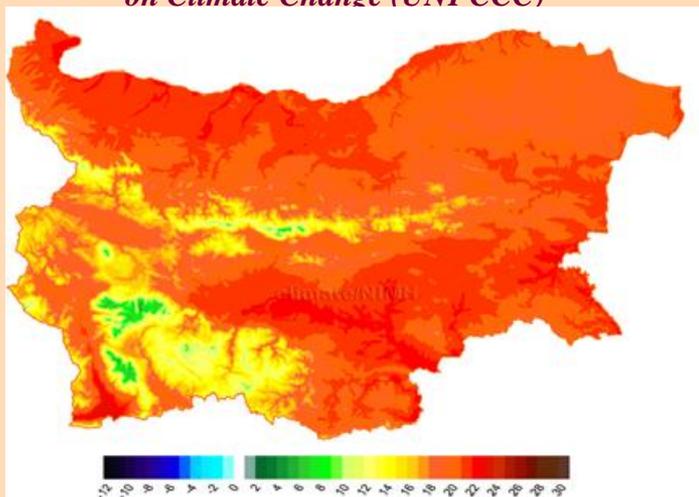


BULGARIAN GOOD PRACTICES

Air temperature in winter and summer during the current climate



Source: 5th National Communication on Climate Change (UNFCCC)



BULGARIAN CLIMATIC ZONES:

- Moderate continental,
- Intermediate,
- Continental – Mediterranean,
- Maritime,
- Mountainous

AVERAGE TEMPERATURE:

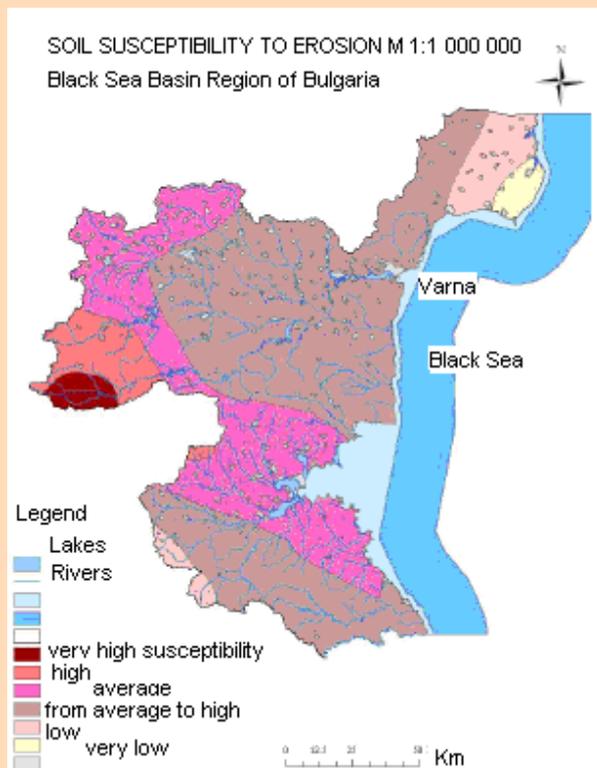
Annual - 10,5°C

In summer – rarely exceed 30°C

In winter – about 0°C (the lowest measured - 38,3°C, Trun, in 1947)

AVERAGE of 2049 hours of sunlight
AVERAGE 99 days with frost per year (in January - 26 days)





Source: The National Plan for Development of River Basins in the Black Sea Region till 2015

COASTAL ZONE

- High elevation - 70% of the coastline is characterised by low, middle and high mountains
- About 45% of the coastline is currently subject to erosion

POSSIBLE CLIMATE CHANGE IMPACTS:

- Coastal erosion and landslides – the greatest treat

- Increased risk of coastal floods in the low-lying coastal areas which leads to:
 - Loss or increase of protecting and maintaining infrastructure
 - Salinity increase
 - Ecosystems loss
 - Coastal habitats' loss

- Invasion of alien marine species
- Reduction of tourist flows in summer

SOIL EROSION PROTECTION - SVEMAR Ltd., VARNA



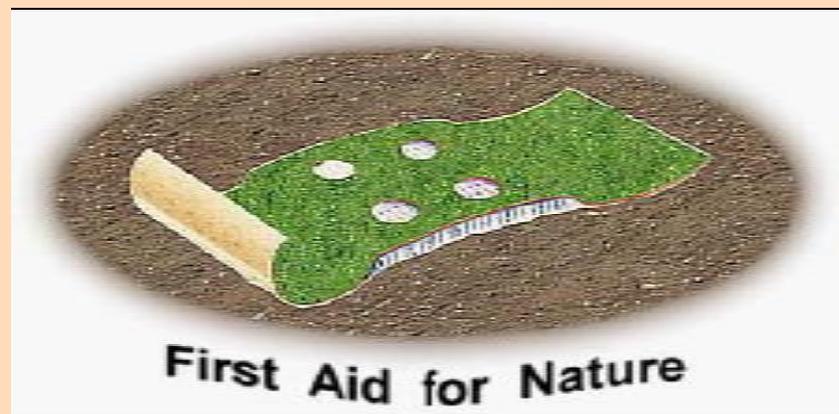
PROBLEMS SOLVED:

Consolidation of batters against superficial erosion through:

- **GEOWEB** – a flexible web, which cells are filled with mould and sown with greenery;
- **GREENFIX** - bio - degradable straw or coconut – mats with 2 layers of light net, and;
- **HYDROSEEDING**

ADVANTAGES OF BIO - MATS

- ❑ Absorb and decrease the rate of surface water flow;
- ❑ Protected surface ensures sustainable development of vegetation and prevents future erosion.



SOIL EROSION PROTECTION - SVEMAR Ltd., VARNA

HYDROSEEDING -
composition of grass seeds,
wood and thready mulch,
compost and water, dispersed
under pressure.



The Terminal 2 of Sofia Airport, 2008



ADVANTAGES OF HYDROSEEDING :

- Seeding of large surfaces for short period of time
- Possible to sow different uneven surfaces and steep slopes
- Fast results – growth after a week
- Up to 5-6 acres can be covered per day by 3 trained people.



RECENT FLOODS IN BULGARIA, 2010:
16th Feb – torrential rains, a steep rise in t° to 15°C , snow melting – rivers Arda, Toundzha, Maritsa overflow.
The Municipality of Smolyan - also in a "severe state of alert,"
May – river Glazne, Bansko
3rd June – Danube river levels rose to 770cm near Vidin
26th July – torrential rains, local rivers near Plovdiv, Pazardzhik went out of their beds

AREAS WITH RISK OF FLOODS AND LANDSLIDES

Basins of the rivers:

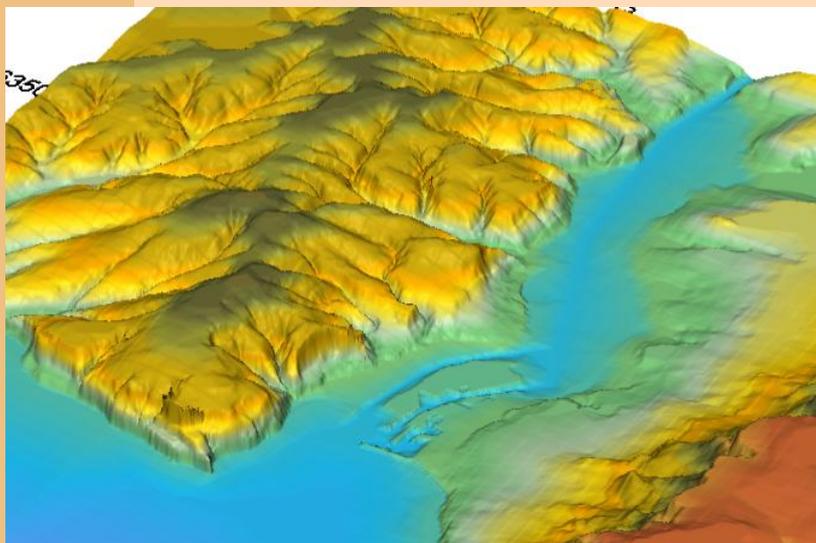
Danube, Kamchiya, Struma, Arda, Toundzha and Maritsa.

The increased risk of floods and landslides is expected to lead to:

- **Damaged or lost infrastructure;**
- **Injures or loss of lives;**
- **Pollution and water-related diseases;**
- **Loss of crops and agricultural land;**
- **Loss or displacing of ecosystems and biodiversity;**
- **Damaged or lost cultural heritage**



SUBSTANTIATED DECISIONS FOR DECREASE OF RISK AND CONSEQUENCES OF FLOODS CORES Ltd., VARNA



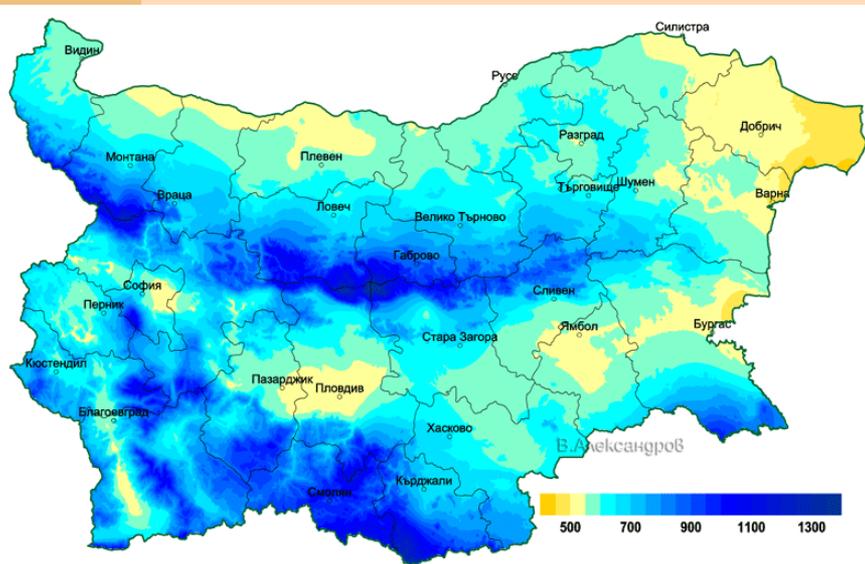
Digital model of the catchment area of Varna

- CORES DEVELOPS
A DECISION SUPPORT SYSTEM (DSS)
for management of coastal flooding,
providing information for:**
- water level forecast;
 - flood inundation mapping;
 - assessment of risk of flooding of coastal areas;
 - assessment of the environmental impact of flooding

- The DSS is based on:**
- numerical simulation software for coastal hydrodynamics;
 - sediment transport modeling



Annual precipitation (in mm) during the current climate



Source: 5th National Communication
on Climate Change (UNFCCC)

Average precipitation - 630mm/ year
The driest weather – average 31mm
in February across 11 days
The wettest weather – average 90mm
in June across 13 days

ARID AREAS IN BULGARIA:

- ❑ Dobrudzha in the North - East,
- ❑ the Black Sea coastal area,
- ❑ parts of the Thracian Plain and the Danubian Plateau.

POSSIBLE CLIMATE CHANGE IMPACTS related to warmer and dryer climate :

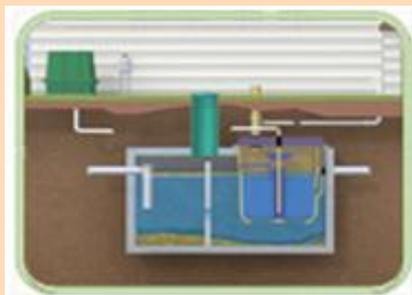
- ❑ conflict between sectors over water use
- ❑ soil degradation and suitable crop areas decrease
- ❑ crop yields decrease
- ❑ biodiversity loss
- ❑ unemployment and migration increase in rural areas
- ❑ natural northward shift of some agricultural crops and trees grown of neighboring countries.



BULGARIAN GOOD PRACTICES

WASTEWATER TREATMENT PLANTS (WWTP)

Fixed Activated Sludge Treatment (FAST) Systems of Bio - Microbics, delivered and built by 3K JSC., VARNA



MicroFAST wastewater treatment systems

Advanced wastewater treatment systems for individual homes, clustered subdivisions and other domestic, small-flow applications.

HighStrengthFAST wastewater treatment systems

Meeting the unique challenges of high-strength commercial applications with robust, lowmaintenance treatment modules.



BioSTORM stormwater treatment systems

Low-maintenance, packaged, stormwater treatment systems for separation of trash, oils, suspended solids and other pollutants from stormwater.

BMI fill MEDIA

Polypropylene fill media for cooling towers, wastewater and stormwater processes. Wider temperature range, improved UV-stability, chemical resistance and durability.



BULGARIAN GOOD PRACTICES

WASTEWATER TREATMENT PLANTS (WWTP)

3K JSC., VARNA

PROBLEMS SOLVED:

- ❑ Water scarcity because of climate change.
- ❑ Storm water treatment after sudden heavy rains and floods.

BENEFITS:

- ❑ The treated wastewater can be reused for irrigation
- ❑ The system should achieve Biochemical Oxygen Demand (BOD5) and suspended solids removal in excess of 90 %
- ❑ No control is necessary for this type of system

PLANTS INSTALLED BY 3K JSC:

- ❑ RetroFast – 9, MicroFast – 13, HighStrengthFast – 3, Biostorm – 2

REPRODUCIBILITY:

- ❑ FAST Systems are installed in 52 countries all over the world





REGIOCLIMA

www.regioclimate.eu

www.rapiv.org

THANK YOU!