Fifth International PhD & DLA Symposium
19-20 October 2009, Pécs

Implementation of a monitoring system on the ecological effects of anthropogenic interventions on the Danube morphology for the Gemenc-Béda-Karapancsa floodplain

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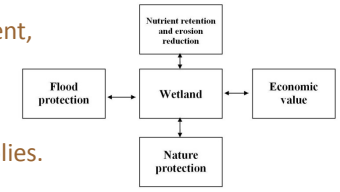
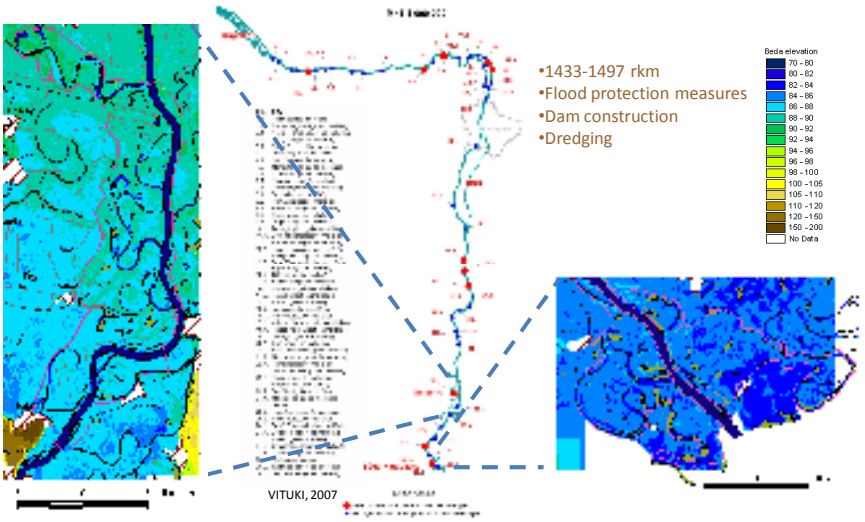
Introduction- problem exposition

- Importance of the wetlands-why should they be protected?
  - Improving water quality by filtering sediment, nutrients, and pollutants.
  - Reducing flood damage.
  - Preventing bank and shoreline erosion.
  - Recharging ground and surface water supplies.
  - Providing vital fish and wildlife habitat.
  - Offering opportunities for recreation, education, and research.
  - Producing food, forest and fuel products.

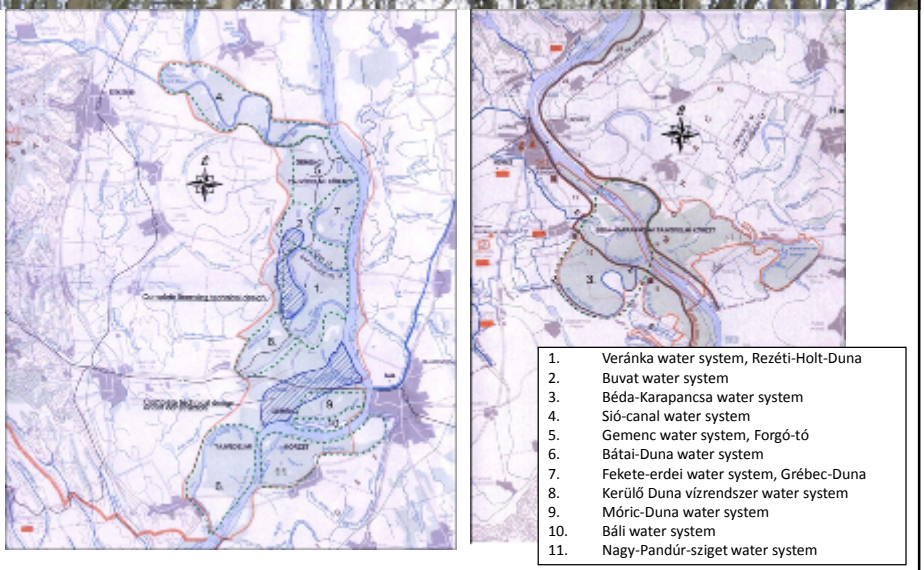


- Anthropogenic intervention and measures
  - Navigation, flood protection measures, dredging

Danube and its wetlands



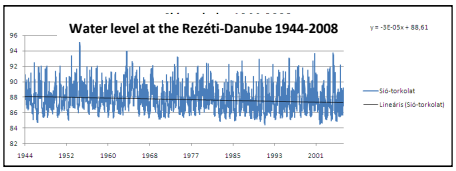
Presentation of the GBK area

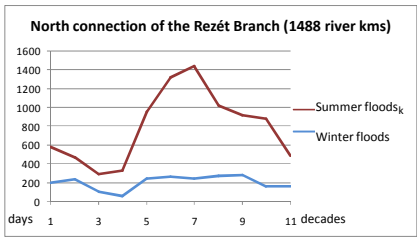


1. Veránka water system, Rezéti-Holt-Duna
2. Buvat water system
3. Béda-Karapancsa water system
4. Sió-canal water system
5. Gemenc water system, Forgó-tó
6. Bátai-Duna water system
7. Fekete-erdei water system, Grébec-Duna
8. Kerülő Duna vízrendszer water system
9. Móric-Duna water system
10. Báli water system
11. Nagy-Pandúr-sziget water system

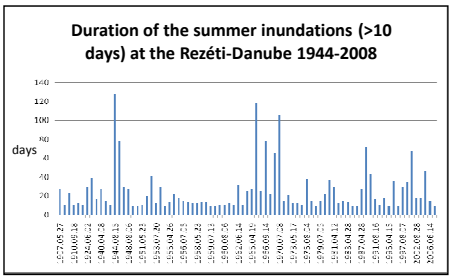
Anthropogenic effects on the GBK wetlands

- The riverbed has sunk by approx. 1.5 m in the area of Gemenc
- Average # flooded days: from 50 to 12 within one century





Figures of Zsófia Derts, BME VKKT



GEF Nutrient reduction project

Aim of the GEF (2009-2011) project:

- International goals: transboundary pollutant loads of regional importance –nutrient reduction of the Black Sea
- Hungarian goals: protection of natural resources, rehabilitation of aquatic habitats

Three different ongoing activites:

Expert panel: water resources management experts, foresters, ecologists, environmental experts)

Conditions

- Minimizing the harmful impacts on the environment (ecological impacts, forestry)
- Minimization of disturbance in the implementation area (Natura 2000 SPA and SCI sites)

Planned mitigation measures in the GBK area

- Improves water distribution and flow conditions in sidearm system
- Increases the nutrient retention capacity
  - Dredging of the river bed (Veránka, Belső-Béda, Bátai-Duna, Móricz Duna).
  - Cleaning of the river bed (Sió-mente, Gemenc, Kerülő-Duna).
  - Confluence corrections (Buvat, Béda-Karapancsa, Mocskos-Duna, Sió-mente, Gemenc, Nagy-Pandúr).
  - Improvement and strengthening of the river bed (Buvat, Veránka, Kerülő-Duna).
  - Lock building (Bátai-Duna, Móricz-Duna).
  - Strengthening of bottom support (Bátai-Duna, Móricz-Duna).
  - Reparation/establishment of pump station, dredging (Belső-Béda).
  - Bottom sill (Sió-mente).
  - River bed widening (Kerülő-Duna).

Aims of the monitoring system

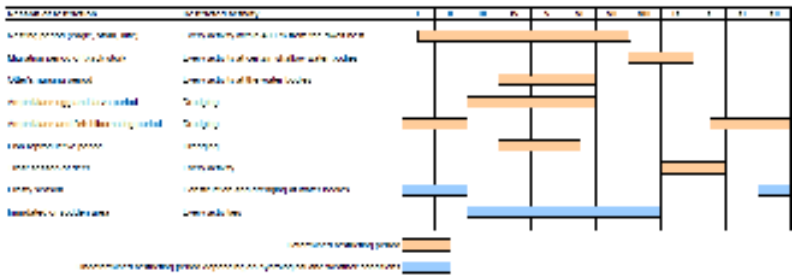
Knowledge gained from wetland monitoring allows water resource managers to:

- Better manage watershed impacts.
- Determine whether proposed projects will create water quality problems.
- Aid in evaluating mitigation projects.
- Encourage wiser watershed planning.
- Better understand how wetlands contribute to the functioning of the watershed as a whole.

Role and features of the monitoring in this project:

- Monitoring system plan for the whole GBK territory (baseline survey)
- Surveillance monitoring
- Meet the WFD requirements
- Impact assessment of measures
- Development of regional management plan
- Ensure low cost future operation

Constraints of the development of the monitoring system



- Difficult access to the area:
  - Meteorological conditions (e.g., installing the groundwater monitoring wells, sampling)
  - Ecological conditions vs. WFD requirements

Elements of the monitoring system in the GBK area

- Surface and groundwater hydrology
  - Trend analyses, modelling, estabilishing new groundwater monitoring wells
  - Inundation, flooding effects, residence times in temporary inundated river branches, role of groundwater
- Water and sediment chemistry
  - Plant nutrients, sedimentation, sediment quality
- Ecological monitoring (WFD based)
  - indicator taxa of keystone and/or other ecologically significant species

Thank you for your attention!

Acknowledgements:

The authors would like to express their gratitude to the supporter of the Hungarian National Technology Platform:

NKTH