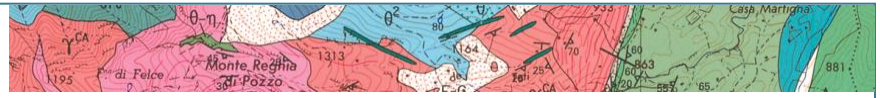
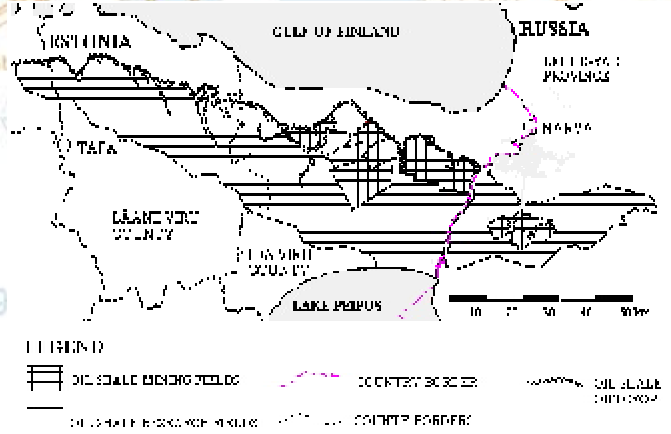
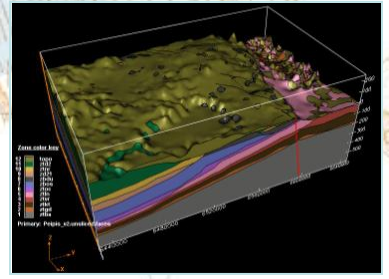


Transboundary cooperation: groundwater management at the Estonian –Russian border





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Lake Peipsi/Chuskoye Transboundary Water Resources -TBWR :

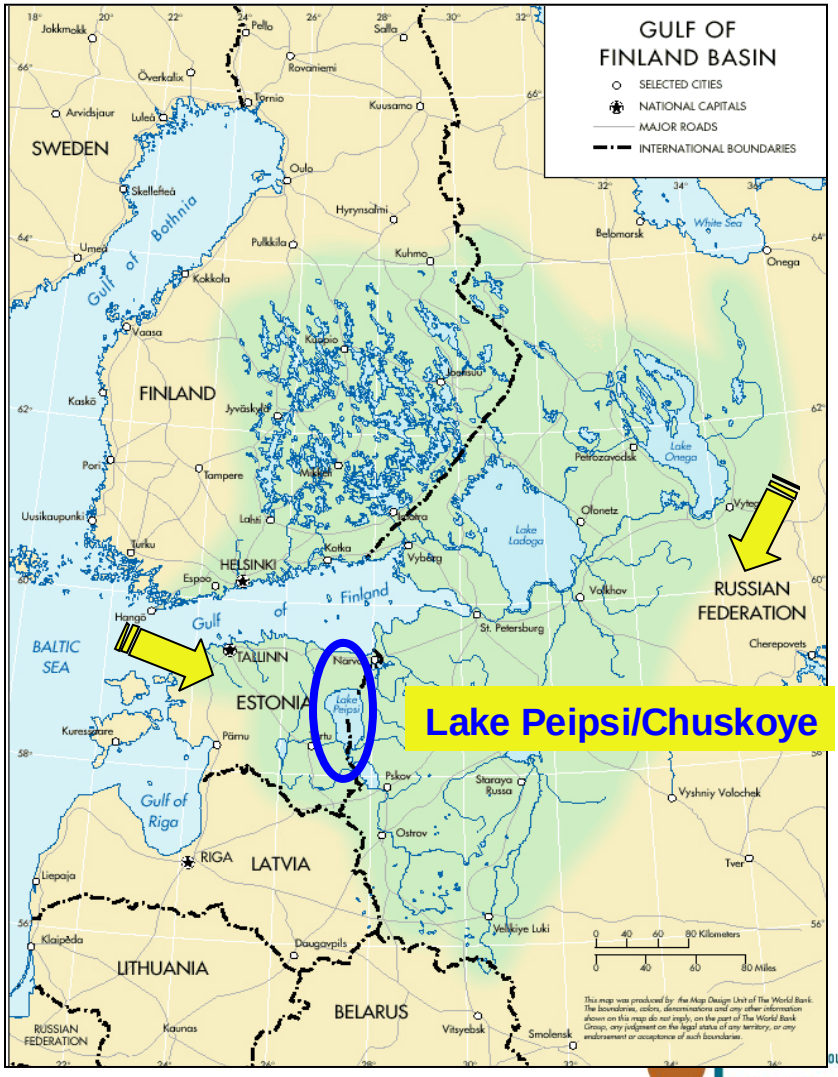
General Setting :

-Estonia :

- Northernmost state of the Baltic countries
- Capital City : Tallinn
- Surface area : 45000 km2
- Population : 1,3 M inhab.
- Neighbours: Finland, Latvia, Sweden and Russia on the east boundary
- EU member since 2004

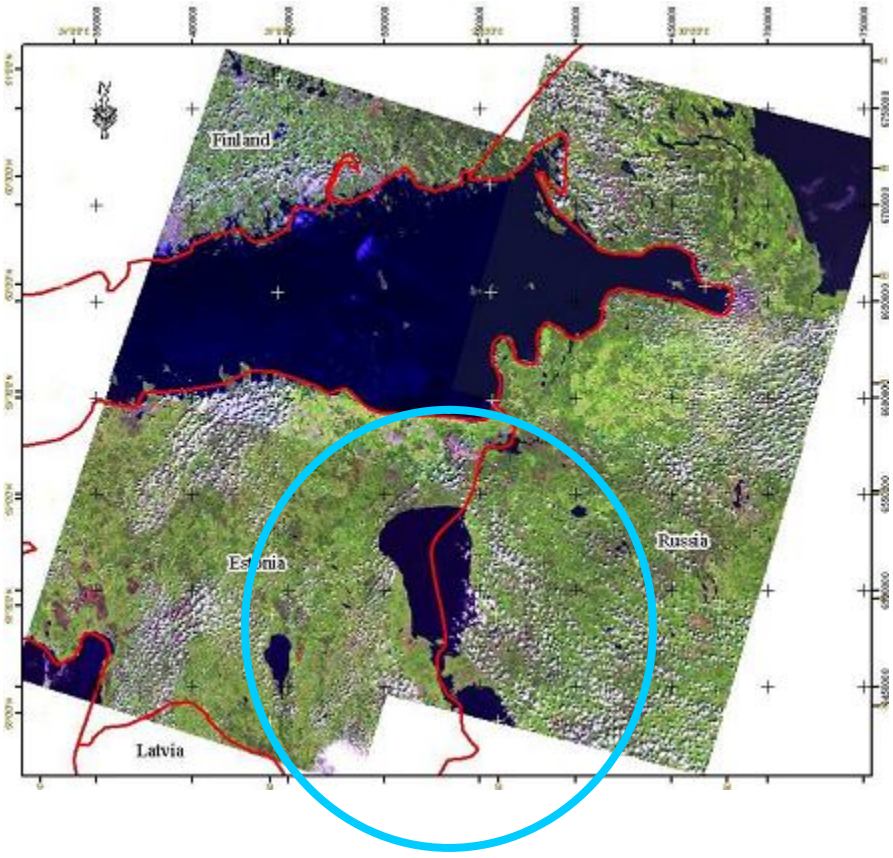
-Russia :

- Capital City : Moscow
- Surface Area : 17 Mil. Km2
- Population : 142 M inhab.
- Non EU member



Lake Peipsi/Chuskoye Transboundary Water Resources –TBWR *: The catchment area*

- TBWR between Estonia (Member state since 2004) and the Russian Federation.
- Area of the lake: 3 558 km^2, the largest TB lake in Europe in 2004
- Total area of the catchment: 47 814 km^2 (> Switzerland)
- Area of the catchment in Estonia: 11224 km^2 (1/4 of the area of the country)
- Outlet of the lake: Narva river, flows into the Gulf of Finland, present boundary between Estonia/Russia
- Population in the Lake Peipsi catchment:
  - **Estonia : 444 500 inhab**
  - **Russia : 421 000 inhab**



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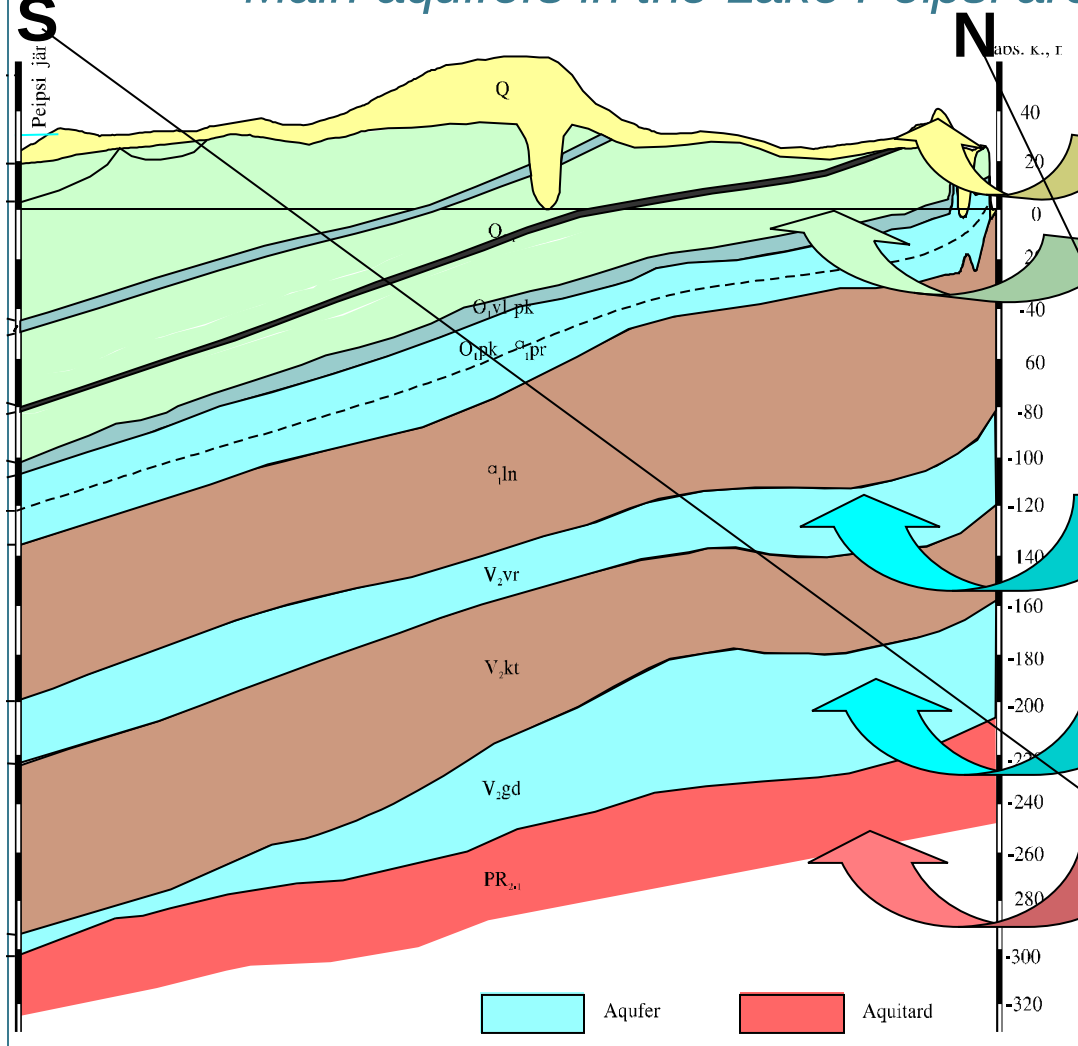
Lake Peipsi/Chuskoye Transboundary Water Resources -TBWR :

Main aquifers in the Lake Peipsi area (Transboundary)



Quaternary aquifer

Ordovician aquifer (includes Oil shale layers)

Cambro-Vendian Aquifer / Voronka

Cambro-Vendian aquifer / Gdov

Hard rock or basement

Surface – Groundwater interaction between lakes, rivers and aquifers

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Lake Peipsi/Chuskoye –TBWR *: The socio-economic framework*

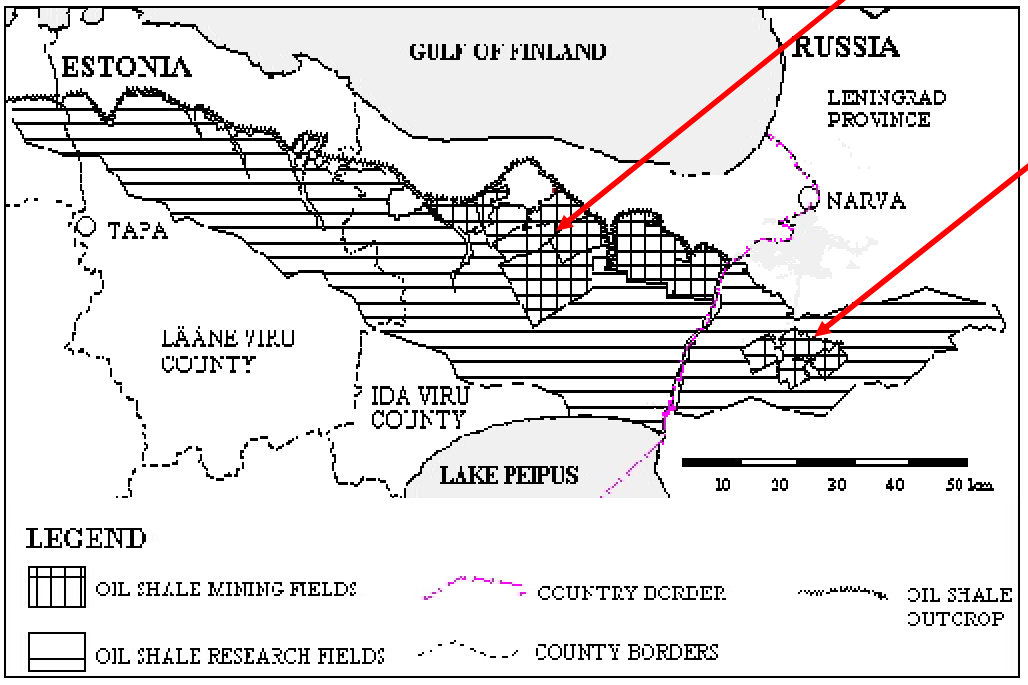
> **Estonia :** The Lake Peipsi catchment includes 4 counties totalling 444 500 inhabitants (out of a total of 1.3 million for the entire country)

- **Ida-Viru Co**.: heavily industrialized at the NE of Estonia, with ***oil shale*** deposits and the border city of *Narva* ;
- **Jögeva, Tartu and Pölva Co**. located on the west side of the lake: generally rural with agricultural activity

> **Russia :** 2 regions or Oblasts : Leningrad et Pskov (including the mining sector of Slantsy) - 421000 inhabitants

Lake Peipsi/Chuskoye –TBWR :
The oil shale mining area

Ida-Viru : industrial zones in red



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Lake Peipsi/Chuskoye –TBWR *:*
Oil shale mining …necessary to produce electricity

- Oil shale mining in Estonia:

1940 : 1,7 MT
1970 : 17 MT
1980 : 31 MT
1991 : 20 MT
2003 : 14 MT

Examples of open pit mining in the Ordovician limestone

- Today: 70% of the world production and 2/3 of the mining activity in Estonia

- Total mining area: 2700 km2

- Active mining area today: 250 km2. Depth of OP mining: 7 to 100 m

- Oil shale used for most of the Estonian electrical production, HC and solvents production, etc.

- Less intense mining activity in Russia

Lake Peipsi/Chuskoye –TBWR *:*
Oil shale mining …wastes and residues

- Mining wastes, ashes from power plants burn outs, residues from cracking (solvent distillation) are piled up in mega spoil heaps

- Significant quantities of pollutants remain in these wastes (HC from mining and PWP burnouts, phenols from cracking, etc.)

- Close loop waste management systems and aspersion of spoil heaps to enhance evaporation (to trap pollutants on the site) are implemented in an attempt to reduce percolation into groundwater and rivers.

Lake Peipsi/Chuskoye –TBWR *:*

Oil shale mining ... a pollution threat to water resources in the Lake Peipsi Catchment

Degradation of water resources

Main problem: chemical contamination of significant portions of the water resources in the mining area by :

- phénols,
- Hydrocarbon products,
- High alcalinity resulting from washing-through ash processes (Blue lagoon phenomena).

Phenol pollution near Khotla Jarve

Blue lagoon phenomena –Eesti thermal/electricity unit

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Lake Peipsi/Chuskoye –TBWR *:*

Other pollution sources …

-Fall-out from aerial pollution such as fly-ash,

-Acid rain due to SO2 emissions produced in the mining areas, …

- Phosphorite mines in the Ida-Viru Co. (use : production of fertilizers)

- Large industrial zone in the Slantsy area (Russia)

- Migration of fertilizers residus, nitrate and pesticides toward surface and groundwater in rural areas (lake eutrophisation, diffuse pollution in groundwater, …)

-Urban wastewater (lack of adequate treatment in some areas)

-Etc.

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Lake Peipsi/Chuskoye –TBWR *:*
Programs of measures to reduce pollution / improve WRM

>Estonia under the WFD obligation with the help of EU has taken several corrective steps/measures to:

- Close, reduce and upgrade existing dump sites
- Reduce mining wastes (to 1/10 in december 2008)
- Modernise combustion facilities by 2015 (SO2 < 25000 T/yr in 2012, less after)
- Planning for application of water quality regulation
- Etc.

>Russia also has taken some steps to improve the situation

>Several EU/UN-funded projects (TACIS, LIFE/FFEM, UNDP/GEF, …) to enhance better water resources management and protection, some of them taking into consideration the transboundary aspects (i.e; Life-FFEM TBGW management project)

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Lake Peipsi/Chuskoye –TBWR :

The LIFE/FFEM GW project : Key figures

- **Clients:** Estonian Ministry of Environment; Ministry of Natural Resources of the Russian Federation
- **Origin of funding:** EU Life Program, French Global Environment Fond (FFEM), Partner contributions
- **Partners:** MoE/Estonia, Estonian Information Centre, Geological Survey of Estonia, Saint Petersburg Geological Expedition, BRGM, GTK
- **Project duration:** May 2002 – December 2007
- **Budget: >3** M€

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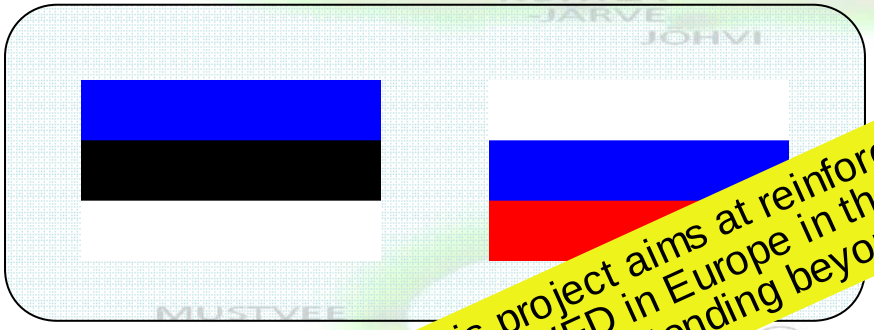
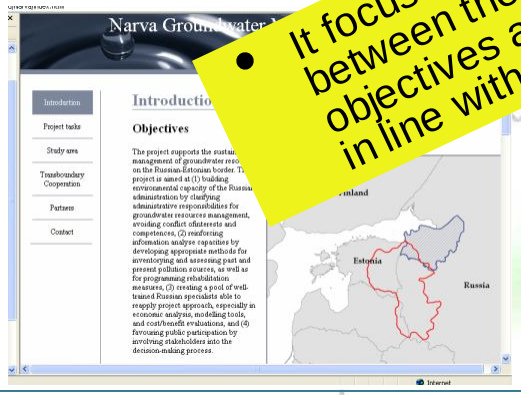
Lake Peipsi/Chuskoye –TBWR :
The LIFE/FFEM GW project : Main Objectives





- This project aims at reinforcing the application of the WFD in Europe in the case of one TBWR extending beyond its frontiers

- It focuses on selected aspects crucial to enhance dialogue between the concerned parties, setting out common objectives and concerted actions … for improved (G)WRM in line with the WFD concepts.

- Reinfor… …eration h… …and Estonia … sustainable …gement of their transboundary groundwater resources, particularly via j…nt technical activities

- Suppor… ad… …pecific tools …ing (institutional …thening)

- Support to the dissemination of information on project activities and results to target groups and to the general public (national and international).

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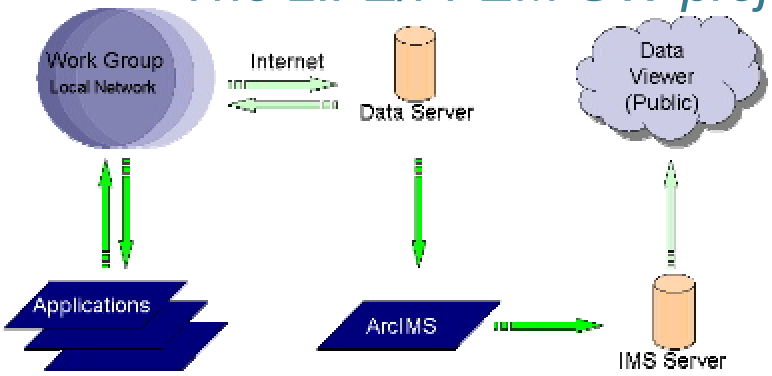
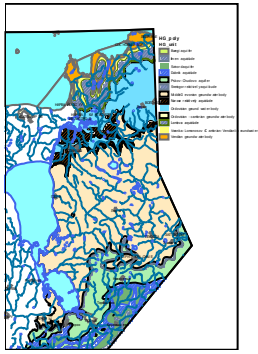
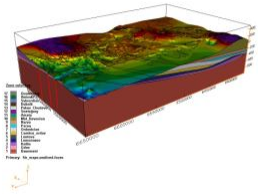
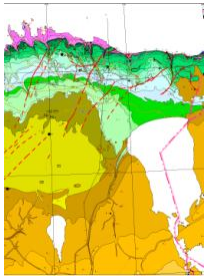
Lake Peipsi/Chuskoye –TBWR *:*

The LIFE/FFEM GW project : Main Focus activities









- Improved monitoring and design and construction of national and international databases and geographic information system. Training

- Geological and hydrogeological modelling at the basin scale (a common GWR management tool). Training

- Environmental “Hot Spots”:

  Impact assessment and Socio-economic studies

  Proposition and validation of recommendations and measures for pollution impact reduction

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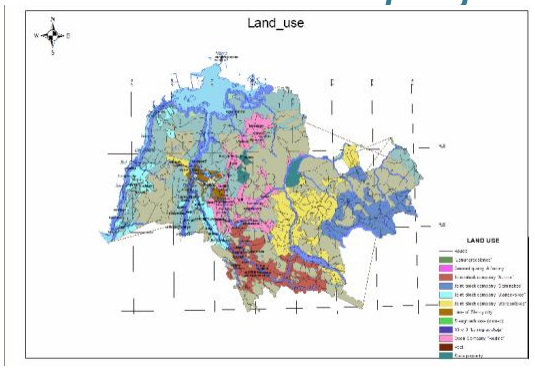
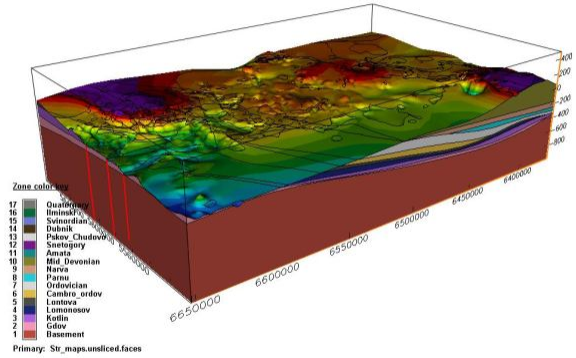
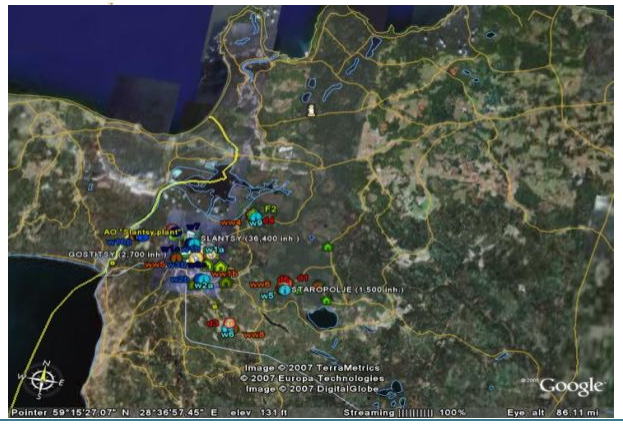
Lake Peipsi/Chuskoye –TBWR *:*

The LIFE/FFEM GW project : Current Status for Main focus activities







- Database and GIS:
  - Estonia: Database and GIS achieved
  - Russia: on-going
- Geological modelling of both country sides achieved, Start of the hydrogeological modelling
- Environmental Hot Spots:
  - Estonia: Impact assessment and recommendations achieved
  - Russia: Information on human pressure collected, start of impact assessment and recommendation

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Lake Peipsi/Chuskoye –TBWR *:*

The LIFE/FFEM GW project : Main conference

INTERNATIONAL CONFERENCE WITH THEMATIC WORKSHOPS IN HELSINKI IN DECEMBER 2007

GENERAL OBJECTIVES:

- Discuss state of the art of the water resources management concept at the basin scale (surface water and groundwater)
- Identify through thematic work sessions activities for sustainable WRM common to both countries

PARTICIPANTS:

- Estonian and Russian stakeholders (public and private)
- Representatives from the European Commission
- Representatives of other countries involved in the area
- International experts

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Lake Peipsi/Chuskoye –TBWR *:*
Estonian-Russian Joint Commission on TBW

> The Estonian–Russian Joint Commission on Transboundary Waters has been established in 1998.

> Two working groups:

- group of integrated water management (leader from Estonian side – vice-chancellor of Ministry of Environment Mr. Harry Liiv; from Russian side – Mr. Grigori Slabikov)
- group of monitoring and applied investigations (leader from Estonian side – Head of department in Ministry of Environment Mr. Rein Raudsep; from Russian side – Mr. Aleksandr Ovanesjants)

- The meetings of the Commission and workgroups take place once per year (one year in Russia, the second year in Estonia).

> Program for 2007: both side are starting up Water Management Plans.

> These activities are financially supported by UNDP/GEF, EU/LIFE – FR/FFEM and EU/TACIS programs/projects.

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Conclusion

Implementing the WFD in the case of TBWR at the frontiers of Europe

> Implementing the WFD concepts at the frontiers of EU for TBGWRM is not an easy task due to :

- different legislation, different working methods, different objectives, different culture on WRM on each side of the border
- a lack of common shared vision/objectives/concerted action for WRM
- a lack of basic funding
- great inertia of many aquifer systems

> It can only be achieved progressively through common projects funded mostly by EU, EU institutes or international organisms:

- But each project can only focus on selected aspects/areas. Full extent of the process over the entire area takes time and requires large amount of funding.

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Conclusion

Implementing the WFD in the case of TBWR at the frontiers of Europe

> Implementing all the WFD concepts at the frontiers of EU for TBWRM is probably an illusion in the short term … but most probably it will be effective in the long term because:

- Projects such as the ones carried out on Lake Peipsi
  - **initiate discussion and progressive data exchange between both parties,**
  - **raise awareness on environmental matters,**
  - **gather stakeholders around common interest WRT WRM,**
  - **help building common tools which can be replicated eslewhere (ie: for river basin management plans),**
  - **help convey the WFD concepts outside of EU thereby enhancing their progressive acceptance …**

- Many principles which are the basis of the WFD are strong and are in line with many of todays needs and with the perception that an increasing number of people have with regard to WRM.

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The Narva River and the fortress … at the outlet of Lake Peipsi

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