Geophysical Research Abstracts
Vol. 21, EGU2019-6016, 2019
EGU General Assembly 2019

Development of joint methodology for groundwater dependent terrestrial ecosystem identification and assessment in transboundary area (Estonia, Latvia)

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Groundwater dependent terrestrial ecosystems (GDTEs) are valuable ecosystems that rely on groundwater input, therefore they cannot be assessed separately from groundwater body. Groundwater aquifers are dynamic systems which cannot be divided by human drawn boundaries such as country borders and should be managed in close cooperation between neighboring countries.
According to the European Union's Water Framework Directive 2000/60/EC, whole groundwater body is considered in "poor status" if groundwater pressure causes significant damage to a terrestrial ecosystem. Additional activities on national level must be implemented to improve its status and if such groundwater body is transboundary, then joint actions in all involved countries should be planned and carried out.
Currently Latvia does not have a methodology how to identify and assess groundwater dependent terrestrial ecosystems (GDTEs), while the neighboring country Estonia has already developed such methodology. Similar climatic and hydrogeological conditions allow to adapt the methodology for Latvia. During Est-Lat project "GroundEco" (2018–2020) joint methodology on identification and assessment of the status of GDTEs will be developed. Project activities form three blocks: (1) information exchange, data collection and mobilization, (2) development of joint methodology and conceptual models, (3) recommendations and dissemination of project results.
First of all, available data necessary for project implementation will be identified through iterative process by filling in a joint questionnaire. Then, the existing Estonian methodology will be jointly updated based on new research data in order to avoid the need for future harmonization of approaches. According to the developed methodology, GDTEs will be identified in the transboundary Gauja-Koiva river basin.
Since the methodology developed in Estonia is only theoretical and has never been tested in field conditions, two pilot studies will be carried out (Matsi spring mire in Estonia and Kazu leja valley in Latvia). Pilot studies will allow testing the methodology and look for the most cost-effective and best descriptive parameters for assessing the interaction between groundwater and terrestrial ecosystems. Investigations (2018–2020) include vegetation sampling and mapping, seasonal monitoring of groundwater level and quality, development of low-cost sensors, aerial thermal imaging for groundwater seepage detection and development of conceptual models for water management needs.
Finally, recommendations for assessment and monitoring of GDTEs will be developed and results will be disseminated to target groups via workshops, seminars and conferences.

The study is carried out within the project "Joint management of groundwater dependent ecosystems in transboundary Gauja-Koiva river basin" (GroundEco, Est-Lat62) funded by ERDF Interreg Estonia-Latvia cooperation programme.