University of South-Eastern Norway

FM4017 Project

Title: Monitoring of Environmental and Health related Data in Grenland from a Historical perspective

USN supervisor: Hans Peter Halvorsen

External partner: Herøya industripark, Sykehuset Telemark, Porsgrunn kommune, Folkehelseinstituttet, Miljødirektoratet og Prosjekt kompetansetjenester miljø og helse.

Task background:

Grenland is one of the areas in Norway with the historically highest density of heavy industry and associated emissions to the environment. Located in the south-eastern part of the county, Grenland is composed of the municipalities Skien, Porsgrunn, Bamble, and Siljan. Throughout the last 50 years, the awareness of emissions and the effects of these has become increasingly significant. Today, emissions from most sources are severely limited by regulations, industry's own awareness of effects and responsibility, as well as through the general public's focus on the right to a safe and healthy environment. Equally, new environmental challenges are constantly evolving, and existing knowledge and experience are important for meeting them in a good way.

Task description:

Digitalization: The latest project should obtain and systematically store information in a Database and present an overview of the emissions and effects of emissions in Grenland in the last 50 years on a Web Site. Grenland is one of the areas in Norway with the historically highest density of heavy industry and associated emissions to the environment. What can we learn from the previous historical environmental issues in Grenland?

In combination with an existing Real-Time Environmental Public Health Information Management System (EPH) created in previous projects, we will get an unique overview of environmental data both in the past and in the future.

Machine Learning (ML) will be applied to get aggregated information from these environmental data. This new insightful information will then be presented on the website. What can we learn from the previous historical environmental issues in Grenland? How can we use historical data on emissions and environmental exposure in Grenland to increase knowledge about environmental and health issues?

The projects should obtain an overview of the emissions and effects of emissions in Grenland in the last 50 years. You should systematize this knowledge in a searchable database to facilitate access to and use of this data for research and development in the future.

The project should uncover what changes in health and environment we have had in Grenland for the past 50 years. You should find out what cleansing knowledge can be conveyed,

exported or transferred to today's challenges at local, national and international levels. What can be learned from history and transferred to today's challenges, the green shift and to shape the new industry.

The project will consist of several parts and the student (s) may partly affect the focus and facility in cooperation with the supervisor and Telemark Hospital, Porsgrunn Municipality and the other partners.

Main parts of the project:

- Identify, collect, and systematize historical environmental information from different sources in Grenland.
- Create a technical solution for a searchable database for storing information about historical environmental and health monitoring in Grenland. You should find an appropriate technical platform for the system as well.
- Data analysis and possibly apply big data and machine learning techniques to make it easier to find the proper information in the available data.
- Project planning and management using Agile (Scrum) project methods
- Write a detailed report of the project.

Student category:

Suitable for IIA, PT, and EET students. It is also possible to have a mix of students from IIA, PT, and EET, which can focus on different aspects of the project.

Practical arrangements:

None

Signatures:

Supervisor (date and signature):

Students (date and signature):