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CHIST-ERA Projects Seminar 2021
*Novel Computational Approaches for
Environmental Sustainability (CES)*

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Introduction: Projects of the Topic

- ❖ **4Map4Heath:** How should the future high-resolution, multitemporal, multispectral laser scanning data be computationally processed to provide timely information for environmental sustainability and especially for mapping of the forest health, tree species classification, mapping of dead trees, and forest fire risk
- ❖ **Supporting Energy Communities- Operational Research and Energy Analytics (SEC-OREA)** - enable local energy communities (LECs) to participate in the decarbonisation of the energy sector by developing advanced efficient algorithms and analytics technologies.
- ❖ **SWAIN:** Sustainable Watershed Management Through IoT-driven Artificial Intelligence. Aims to protect rivers from micropollutants by designing an early warning system for water treatment plant failures.
- ❖ **WATERLINE:** NEW SOLUTIONS FOR DATA ASSIMILATION AND COMMUNICATION TO IMPROVE HYDROLOGICAL MODELLING AND FORECASTING



Major Achievements and Outputs

- ❖ **4Map4Health:** Aimed focus at on creating a method for predicting bark beetle outbreaks in the European forest, forest fire risks, and tree species/dead tree classification, international comparison of computation methods, started 1 April 2021 (three partners still missing funding)
- ❖ **SEC-OREA** will begin at the end of April 2021
- ❖ **SWAIN** aims the identification and localization of micropollutant contamination in European rivers in near-real-time and consequently prompt decision-making.
- ❖ **WATERLINE** aims to improve hydrological forecasts exploiting recent advances in information, communication and remote sensing technologies, combining various sources of hydrological information, engaging citizens in environmental monitoring and bringing various stakeholders closer to scientific results



Upcoming Challenges and Needs

- ❖ **4Map4Health** needs to carry out measurements in 5 countries (corona) and in some countries having two epochs
- ❖ **SEC-OREA** has just started the recruitment process, we hope we'll get great young researchers, and great data for our models!
- ❖ **SWAIN** has the first challenge of data collection in watersheds in Turkey and Finland as much as Covid regulations allow.
- ❖ **WATERLINE** started on March 1st. Upcoming challenges are focused on setting up the different case studies and identify stakeholders. Secondly, start the multi source data assimilation in hydrological models

Conclusion: All projects envisage data challenges, and have concerns about the impact of Covid - no physical meetings on collaboration, and access to the field for measurement and stakeholder engagement.



Possible Roadmap

- ❖ **4Map4Health:** field work, data acquisition, development of computational methods, results/iteration, impact, we are in contact with 20+ organisations (end-users/academic) listed in the plan (mostly virtual meetings), strong support (HW&resources) from PI organisation
- ❖ **SEC-OREA:** recruitment, preparing the data management plan, then next steps implementing the work package tasks
- ❖ **SWAIN:** First steps are the data collection, preparing data management plan, then we start with the model development.
- ❖ **WATERLINE:** start of co-development of web apps and tools, data collection and assimilation, set up different model realizations

Conclusion: There will be a real need for project specific contingency plans to be developed



Role of the CHIST-ERA Support

- ❖ Connecting with other research teams with similar interests is helpful
- ❖ CHIST-ERA Open science policy which provides clear guidelines

Conclusion: Too early for 2019 grantees to comment deeply



- ❖ **4Map4Health:** diversity taken care in the composition, open science highly taken care, young scientists hired, continuous dialogue between end users, we contribute to several UN SDGs
- ❖ **SEC-OREA:** opportunities to address gender, sustainable energy and climate UN Sustainable Development Goals. Fostering gender balance in the research team, and also the gender dimension of the research itself
- ❖ **SWAIN:** promoting young scientists and first time applicants as PIs, providing open data repositories, fostering public engagement by providing web interfaces targeted for general public, which summarize project outcomes.
- ❖ **WATERLINE:** offer equal opportunities, provide open data sets and publications, encourage open data sharing in public repositories, encourage stakeholder involvement.



- ❖ **4Map4Health:** Open publications describing the solutions and some novel data shared as part of open publications so that documentation and data are not separate actions, open data shared also in international benchmarking test, openly describing the results to industry, FGI data/test site is also related to national Research Infrastructure providing open data
- ❖ **SEC-OREA:** will be using open source climate data, and will use open access publications and GITHUB for code repository.
- ❖ **SWAIN** has the overall goal to make data from watersheds openly available in higher granularity than state-of-the-art to allow data fusion and collaboration. A challenge towards that end might be the national regulations that regulate sharing data related to, for example, environment and geography.
- ❖ **WATERLINE:** open science NEEDS open data



- ❖ **4Map4Health:** 13 companies and end-users involved in the network (Collaboration letter included in the proposal) related to the project, they are major potential beneficiaries. No problems between OS and TT.
- ❖ **SEC-OREA:** strong stakeholder participants who will benefit from results.



Questions ?