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Report 2 of Citizen Science in the Bergen Case study

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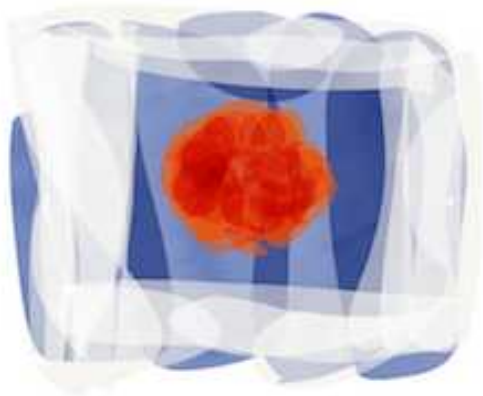

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Executive summary/summary

In the Bergen case study of CoCliServ, a citizen science group formed itself, in order to co-cretae climate services by developing low cost sensor stations and doing their own measurements in places that matter to them. This can be their own homes, work places or places they take a special interest in. This is report nr. 2, which covers the progress of the first half of 2019.

Goal/Purpose of the document

Purpose: to keep the other members of the project connected to the developments in the Meet je Stad group. It gives insights into:

- number and characters of the meetings
- number of participants and their interests
- cross-polination between MjS and other projects, governments or academic scientists
- future plans and opportunities that arise from MjS

Relationship to the Description of Work (DOW)

This report based on the Bergen case is the second update of the D5.2 Facilitation of intervision and exchange of experiences between the citizens involved in the case studies

Progress

Since the previous report in January, some progress has been made both in the community and in the technical development of Meet je Stad.

Workshops

A fourth workshop has been organised by one of the Bergen participants, which took place during the Future of Meteorology symposium in Media City in Bergen. There were about 30 participants, mainly from the field of meteorology, or related areas. The particpants came from many different coutries, including Germany, France, Belgium and of coarse Norway. All of the participants went home with a working sensor station, but relatively few actually activated the station when they got home. This is a common problem when participants are professionals rather than intrinsically motivated citizens. Often, the policy

makers and other professionals are very interested during the workshop and motivated to join, but they do not activate their station. Doing workshops with professionals is basically throwing away materials. This does not mean the workshop is useless, most participants do talk about it to others in their fields, but if the purpose of the workshop is to get measurements and to get people to actively join the community, professionals are not the ideal audience.

Talks and cooperations

Future of meteorology symposium

Also during this symposium, Scott Bremer and Diana Wildschut were invited to join a panel discussion on the Future of meteorology, together with Christine Støver Jensen of YR.no, the Nowegian weather service that is used by people all over the world, and Joachim Reuder, a proffessor of meteorology at the University of Bergen. The discussion was about the possible use of citizen science for meteorology. YR has been using the data from citizen sensor stations of the Netadmo project to make better predictions of the temperature at ground level. This has made their predictions more accurate. In some locations the difference between prediction and actual temperature used to be 7 degrees centigrade, and by using these measurements to fine tune their predictions, the difference is now well under 1 degree centigrade (**Støver Jensen 2019**).

Yr.no

At Yr they are not afraid to take a good look at the quality of citizens results, and if those results are good enough, to make use of them. Christine said that they would be interested in looking at the MjS data for use in their predictions as well, prvided that it would be ofered to them in the desired format. Attempts are now being made to get the MjS Bergen data in the right format. A participant of the previous workshop in Bergen has offered to have a look at making a scraper for the data (for his own use), and he may be able to make a second one for YR to use.

The meteorology department of UiB

Also Joachim Reuder was very interesting to talk to, he had already looked at the MjS data before I met him, and had thought of a solution that we had already

built and are testing in Amersfoort. He wanted a light sensor added to the station, so we could know if the station is in the sun. We have a system like that, and we are now making two extra stations for Jaochim to test for us, which he offered during the symposium. He has tested a few sensors, much more expensive ones, and was willing tot test ours as well. We already know the measurements make sense, but now we will also find out under what light conditions they are less reliable, and how to compensate for that. He also uses a different low cost diffuser than the half pingpong ball that we use, and has tested that thourougly.

We have also duscussed the possibility of putting sensor stations in the mountains surrounding Bergen. One of the participants wanted to do that anyway, and Joachim and Tobias Wolf, also from UiB meteorology, had a use for that data as well. One of the problems with predicting temperature in Bergen is an inversion layer in the valley in which the city is located. It makes weather predictions less accurate because “Meteorological models poorly capture both G-inversions and E-inversions reducing their utility for the assessment of urban air quality and local weather forecasts.” (Wolf, Esau,& Reuder 2014). They measured the inversion layer using a microwave scanning device that performs well on dry days, but not so well when it rains. The city of Bergen is famous for its rain.

The Netatmo stations that Yr uses are now all in the valley, if we mount some stations higher up, we can see whether MjS can help improve predictions. Since MjS stations use LoRaWAN, are battery powered and relatively cheap, it becomes possible to mount several of them in places where there is no power or internet.

Possible new spin-off

One of the participants of the workshop at the symposium lives in Oslo and has put her stayion online there, and now there is a request for more stations in Oslo. This is outside the scope of CoCliServ, but when you look at how much knowledge sharing and problem solving there is between sites, it is unlikely that an Oslo based group will not add value to CoCliServ.

Hardware and software issues and improvements

A come back day has been organised, for participants who had problems with their station, or who just wanted to meet again. From SVT, a new phd student,

Elisabeth, was there, and she made cake for all the participants. Things like that are very important if you organise a workshop. People do it in their free time, and the atmosphere has to be relaxed and informal. A home made cake works! There were a lot of people there, and we got many stations back online.

A few station had been built in the previous months by people who needed no workshop, but they did not manage to get the stations online because of firmware related issues. We managed to show them how to do it, and now there are a few more people there who can help others out with that type of problem.

In the Riot chat room, the main language has changed from Dutch to Norwegian, due to the appearance of the Bergen collegues. Many technical developments are discused there between participants of the the cities of Amersfoort and Bergen, and many a problem has been solved. The appearance of the Norwegian participants in the discussion has given the chat room a much more technical character, where it used to be a bit more social. This may be due to the fact that the Bergen MjS community has only a sensor project, whereas the Amersfoort project has a narratives part and a flora observation part.

Expected near-future developments

We can expect some Ethiopian participants anytime next year, as there is now a project starting in Addis Abeba, where the university dues not have any measurement equipment at all for their climate coarses, and they are now starting to use MjS stations for their students and for their researchers.

In the coming months we will tighten the connection with the participants a bit more, by sending them links to the data and doing some analyses, and also with another repair day.

We will also see what we can do with the scraper for YR, it would be great to have MjS data used in official predictions. Also, we want to make another attempt at finding out if there is any interest in analysing the data, by the community.