week 1

We started the week by meeting our collaborators, sitting down and discussing ideas. The topic of water and the openness of the project had attracted much interest – we had over 10 collaborators who wanted to work with us. Unlike many of the other projects, we had not decided on a specific path (we had not selected our data set or sketched out visualisation ideas) but we did have a few questions we wanted to see if we could answer.

In the first few days we listened to stories from our collaborators and learnt about water issues in Spain. Examples include depleted groundwater due to excessive extraction, water being shipped from other countries[1], draughts in Barcelona, the campaigns to lower water usage and laws which restrict certain uses of water. We also looked at existing campaigns, such as Melbourne's Target 155[2] and the campaign by the Catalan Water Agency to reduce water use during draughts.

We found a lot of data related to water from many different sources, including very granular data from the Catalan Water Agency[3]. As we reviewed the information and our initial questions, we decided to turn our focus to the Target 155 campaign in Australia. What interested us about the campaign was the simple 155 litres figure (the campaign urges the people of Melbourne to reduce their use of water to keep it below 155 litres a day per person). We realised that for the government to produce this figure, it must calculate it from data on water availability and water use. What interested us was not so much the figure itself but how it was reached. Our reasoning was that there are many laws and rules we all have to follow, but it's quite natural to question them and find out why they exist. The questioning will either result in an understanding which is more likely to produce the type of action being called for, or bring to light problems or conflicts of interest which can then be challenged. Applied to the 155 campaign, the questioning should reveal the amount of water available and the amount used by different sectors. We decided to try and focus our efforts on a visualization which would answer the 'why?' question: Why should we limit our water use to a certain number of litres a day? The result would be a visualisation which either convinces people that action to reduce personal water use is necessary or shows that the problem lies elsewhere – e.g. unequal distribution, infrastructure, or excessive use by industry.

Having reached this point, we outlined the type of data we would need and began to look at sources to see if we could find data on availability and use to find out which countries are struggling to meet demand. We also figured if we had access to such data we would be able to not only understand how the 155 figure was reached but attempt to calculate a similar „sustainable" level for other countries based on their water availability and use.

Having searched for suitable data the closest sets we found were the World Water data on Total Renewable Freshwater Supply[4], by Country and Freshwater Withdrawal[5], by Country and Sector.

This data, unfortunately, does not tell us how much of the water is currently accessible – the first set tells us how much water is available in each country each year („renewable surface water and groundwater supplies, including surface inflows from neighboring countries"). The second set tells us how much is withdrawn („water taken from a water source for use"). Looking at the data we can see that many countries have a huge amount of renewable freshwater but very little withdrawal – what we cannot tell from the data is whether the amount withdrawn is due to limited access to freshwater, lack of infrastructure, or simply a sign that there's no shortage in a particular country. Furthermore, the data doesn't show us the internal struggles within countries for access to water – for example, the data cannot tell us that there are water shortages in Barcelona while the neighbouring region of Aragon has plenty of access.

These are complicated issues that have not only to do with water itself but also with politics, infrastructure and many other factors.

1 *BBC article, Spain sweats amid „water wars"*

2 http://www.ourwater.vic.gov.au/

3 http://aca-web.gencat.cat/aca/appmanager/aca/aca/

4 http://www.worldwater.org/data20082009/Table1.pdf (2006 Update)

5 http://www.worldwater.org/data20082009/Table2.pdf (2006 Update)

week 2

We started the second week by accepting that our data cannot be used to calculate a general sustainable level for each country. Nonetheless, we thought the world water data would still be interesting to visualize as it can highlight the potential for water use in the different countries and shows how much is currently withdrawn for domestic, industry and agriculture use.

The more granular data supplied by the Catalan Water Agency could be used to show water levels in the dams and how much is withdrawn from the dams for use over time. Talking with the guys from the agency we learnt that the most interesting period to visualise would be before, during and after the draughts in Barcelona.

VISUALISATION

In terms of visualisation, we noted 3 areas of interest:

Global – using the world water data to show average renewable freshwater and withdrawal

Europe – using Eurostat to show the same as above but with the addition of the time factor (Eurostat has yearly figures on availability and withdrawal for each country in Europe)

Barcelona – using the data to show how draughts affect dam levels, river flow and water use (data from 2005 to 2009 available).

Due to lack of time we decided to focus on the global scale at first. Our initial idea was to represent countries as circles in the form of cells. An outer circle showing overall availability (renewable freshwater, not necessarily accessible) for one country and inner circles showing how water is used (domestic, industry, agriculture). We imagined two views: the first with circles appearing in a grid, the second with the circles mapped to their geographic positions.

Soon after starting work on this visualisation we realised that we had two problems:

Using absolute availability values to draw circles creates such a huge difference between countries that it becomes almost impossible to see the smaller circles and the big ones on the same screen.

The style of visualisation and the type of data used could lead some viewers to conclude that nearly all countries were using water well within their limits and therefore faced no shortage (except in a few minor cases, total renewable freshwater in a country is much greater than the amount withdrawn each year).

How to proceed from this point became a contentious issue. One of us wanted to stick with the circles and attempt to resolve the problems above, for example, by drawing availability in relation to population size or land area, and changing the style slightly to avoid misinterpretation. The other path was to rethink the visualisation and even consider new data.

One difference in our view of visualising data which emerged at this point was how far we were willing to go in extrapolating the data we had access to for the purposes of visualisation or to highlight future problems. One of us felt that for such a contentious issue to extrapolate would require a certain confidence in the factors that affect water availability and use. To do it and present it in the visual language of scientific charts could end up being very misleading. This was an issue we could not agree on and resulted in us taking divergent paths at the very end of the process.

DATA

Below we list some of the data we looked at and considered for use in visualisation. We also list some of the recurring problems we had with data related to water.

World Water: renewable freshwater and withdrawal data for each country – averaged to show annual amounts

Eurostat: same as World Water, more granular but only for European countries – showing values each year

Catalan Water Agency: very granular data on dam levels, river flows and outgoing water for use – data in some of the sets we received showed values every 5 minutes and others once a day or week.

... AND ASSOCIATED PROBLEMS

Spain: Getting access to the necessary data can be difficult, depending on the region you're in. Even in the case of Barcelona, where we were lucky enough to have people from the Catalan Water Agency with us, getting data on how the water they treat is used required talks with another organisation.

World water: Global data is usually averaged over several years and so it's difficult to see changes over time. According to the World Water report: „Data on water use by regions and by different economic sectors are among the most sought after in the water resources area. Ironically, these data are often the least reliable and most inconsistent of all water-resources information."

Real-time data: Not easy to find, and in cases where it is available it has to be treated carefully as it relies on sensors affected by natural conditions – for example a leaf covering a sensor can result in erratic data being sent back.

Measuring supply and consumption can be very difficult in many countries where people drill and use wells to access water directly.

REALITY

„The world's water crisis is not related to the physical availability of water, but to unbalanced power relations, poverty and related inequalities."[1]

One thing we've learned in these last few weeks is just how difficult and contentious the issues surrounding water availability and use are. The situation is different in every country and a global visualisation using the data sets we have cannot explain these difficulties and struggles and often hides them from view.

In the case of Spain, for example, the Aragon region has river flowing through which provides people with easy access. The neighbouring Catalonia region often lacks water and has to negotiate with Aragon for access. In 2008 Barcelona resorted to shipping in water from France to try and meet demands.

Another example is the recent Amnesty International report criticizing Israel for unfair distribution of water[2]: „Israel allows the Palestinians access to only a fraction of the shared water resources, which lie mostly in the occupied West Bank, while the unlawful Israeli settlements there receive virtually unlimited supplies."

As for Gaza: „90 to 95 per cent of the water from its only water resource, the Coastal Aquifer, is contaminated and unfit for human consumption. Yet, Israel does not allow the transfer of water from the Mountain Aquifer in the West Bank to Gaza."

THIRSTING FOR
PALESTINIAN ACCESS TO WATER RESTRICTED

MORE INFORMATION

http://www.hydrostatusofnow.org

Working Wiki – *used to collect links and interesting information during workshop*

1 Stockholm International Water Institute

2 http://www.amnesty.org/en/news-and-updates/report/israel-rations-palestinians-trickle-water-20091027