

The artwork consists of several large, overlapping spirals drawn with thick blue and black lines on a light blue background. Interspersed among these spirals are various elements: red numbers (5, 3, 2, 7, 9, 0, 5), green brushstrokes, and white geometric lines. Some of these lines form right-angled triangles with small squares at their vertices. One triangle in the upper left has a vertical side labeled '50', a horizontal side labeled '10', and a hypotenuse labeled '51'. Another triangle in the lower left has a vertical side labeled '33' and a horizontal side extending to the right. The overall composition is complex and layered, suggesting a connection between art and mathematics.

LOUISE  
ARNAL

**GAMBLING  
WITH  
FLOODS?**

Art exhibition at The MERL  
1 - 15 November 2019

**For Aleix, Greg and Ricardo.**

## THE EXHIBITION

**‘Does the flap of a butterfly’s wings in Brazil set off a tornado in Texas?’ (Edward Lorenz) ... Or a flood in Reading?**

Floods are expected to become more frequent in the future. With a growing population at risk, it is vital to predict events in advance. As knowledge and technology have evolved, we have created more sophisticated forecasting systems. We can now predict how a river will change days, weeks, and sometimes months in advance.

But nature is chaotic, and forecasts still far from perfect. How far can machines really predict floods in nature’s noisy chaos? The forecaster is key to forecasting. They question the quality of their predictions, helping us to better prepare for floods.

**Will there be a flood in Reading this winter?**

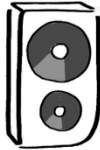
**Enter the forecasting machine to make your own forecast.**

This is a science and art immersive installation, in which the spectator becomes actor, a forecaster playing with real data and creating a flood forecast. The aim is to make space for questioning around the science and art of forecasting floods, outside the realm of science. Do you want to explore this topic further? Why not try this online game I co-created: [imprex.arctik.tech](http://imprex.arctik.tech)

# THE METAPHORICAL FORECASTING MACHINE

## Past weather (weather sayings).

Where do *forecasts* stand in the midst of long-standing traditional methods, based on experience and intuition, such as *weather sayings*? Knowing what the weather was like in the past can give the forecaster an idea of what it might be like in the future. But be careful, not all *weather sayings* are true!



## The computer (fruit machine).

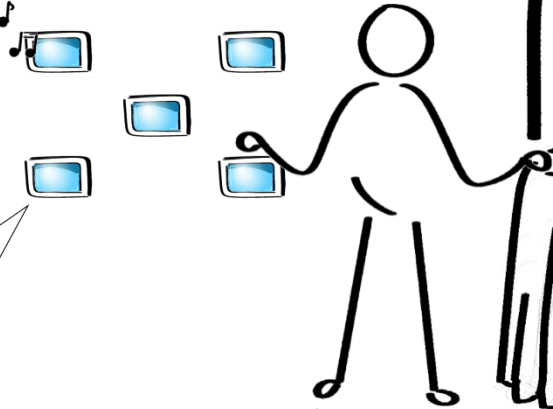
Like a fruit machine, *forecasts* can be a bit *random*. There are small mistakes in the *environmental data* and in the *model* the forecaster uses. These mistakes can become larger in the *forecast* (like a snowball getting bigger as it rolls down a hill). But the forecaster can't know for sure how large they are.

## Environmental data (window to the world).

To make a *flood forecast*, the forecaster needs *environmental data*. For example, knowing how much water there is in the ground now can help them *forecast* how a river will change in next week or month, even if the *weather forecast* is not perfect. That's because water moves slowly from the ground to the river.

## The forecaster (you).

Someone running a *model* on a computer to make a *forecast*. The forecaster also needs to be able to understand and explain the meaning of the *forecast* to others, using simple words and images.





### 3 different forecasts (3 spinning wheels).

Because the *forecast* can be *random*, the forecaster can be more confident by running the *model* many times (like running an experiment several times to check if the result is the same). The forecaster then gets many *forecasts* (like the different wheels on a fruit machine). If most of the *forecasts* show that a flood will happen, there is normally more chance that it will.

### The forecast (*haiku*).

Because the *forecast* can be *random*, the forecaster's knowledge and judgment is very important. What does the *forecast* mean? Can I fully trust it? How different is it from what happened before?

## GLOSSARY

**Environmental data:** information about what the world around us looks like now – e.g. is the ground very wet? Is there a lot of water in the river?

**Flood:** a lot of water on ground that is normally not wet.

**Forecast:** a guess (based on knowledge and experience) about something that will happen in the future – e.g. will it rain tomorrow? Will there be a flood next week?

**Haiku:** a form of poem, with 3 lines, invented in Japan.

**Model:** a mathematical code that represents reality – e.g. how rain falls and how snow melts.

**Random:** describes something that can give a surprising result, that we hadn't thought about before.

**Weather sayings:** e.g. "Red sky at night, sailor's delight. Red sky in morning, sailor's warning."

## THE ARTIST



Louise is a scientist with a lifelong love of art. She is finishing her PhD in flood forecasting at the University of Reading and at ECMWF (European Centre for Medium-Range Weather Forecasts), partly funded by the IMPREX H2020 project. Coming from a family of artists, art has always been a part of Louise's life and 2 years ago she began exploring ways in which to combine art and science.

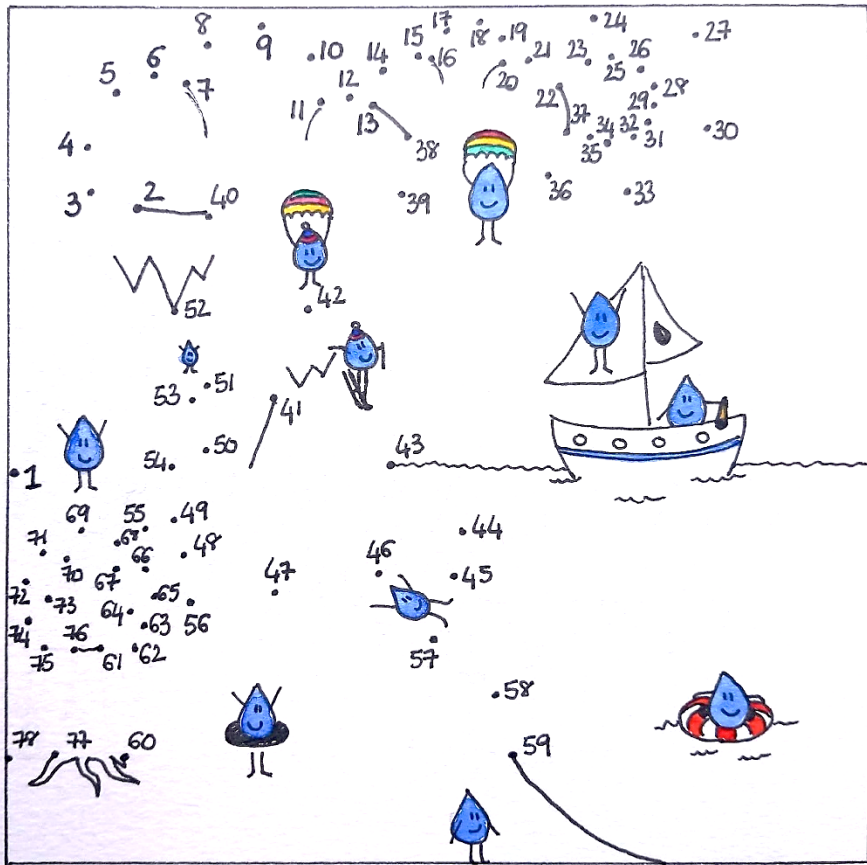
Louise has created this installation as part of her PhD, inspired by the science she and scientists at the University of Reading and ECMWF do. She wanted to recreate an atmosphere metaphorical of her PhD's research, to give an audience beyond the scientific community the opportunity to experience it. Louise is fascinated by water and chaos, the subject matters of this exhibition.

Art blog. [sciartfloods.wordpress.com](https://sciartfloods.wordpress.com)

Twitter. [@ArnallLouise](https://twitter.com/ArnallLouise)

# THE LITTLE FORECASTER

CONNECT THE DOTS FROM 1 TO 78 TO DRAW THE WATER CYCLE.



Technical installation: Stuart Mitchell.

Guidance & support during the creative process and planning: Julius Kreißig, Dominique Caseneuve, Marie Arnal, Hannah Cloke, Lise Autogena, Joshua Portway, Hilda Carr, Katie Cooper, Katya Dimitrova and Florian Pappenberger.



Voices & photos: Hannah Cloke, Rebecca Emerton, Pete Castle, Jess Neumann, Jamie Towner, Sazzad Hossain, Ervin Zsoter, Damien Decremer, Calum Baugh, Siobhan Dolan, Maureen Wanzala, Liz Stephens, Christel Prud-homme, Helen Griffith, Claudia di Napoli, Shaun Harrigan, Fredrik Wetterhall, Christel Prudhomme and Florian Pappenberger.

Weather sayings: twittersphere.

With the support of: