Find the stocks

This article reports on the presence of radiation from the Chernobyl nuclear facility in a Ukrainian water reservoir known as the Sea of Kyiv.

The exercise required you to identify the stocks. The easiest way to do this is to **imagine that time was frozen** and that the world stood still. All we have is a **snapshot**, just like in a photograph where nothing is moving. In this exercise, we can imagine that we have a photo of a frozen lake.
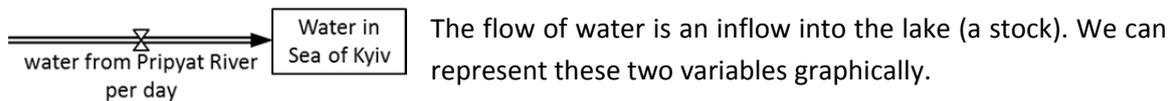
The stocks

We can only measure stocks in this frozen world. Here is a possible list of the stocks in the article:

- The number of cubic meters of **water**
- The number of cubic meters of **mud**
- The number of **fish**
- The quantity of **radioactive sediments** (cesium, radionuclides)
- The number of **water plants**
- The amount of **other food** in the lake

Did you notice that the article referred to "an accumulation of radionuclides" in the fourth last paragraph? This is another clue that radionuclides are indeed a stock.

The flows and other variables

If the world is frozen, we <u>cannot</u> count the *number of cubic meters of water per day* that is flowing into the lake from the Pripyat River outlet in the Exclusion Zone of Chernobyl. When time stands still we can no longer see the water flowing.

The flow of water is an inflow into the lake (a stock). We can represent these two variables graphically.

We <u>cannot</u> count the number of *fish caught per week* from the lake. If the world is frozen, all activity stops and the fishermen cannot pull fish out of the water.
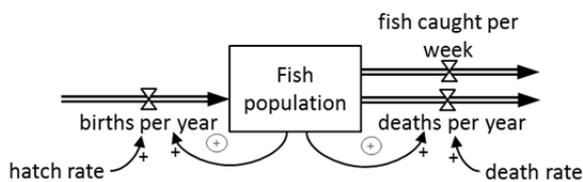
The number of fish caught per week is an outflow from the fish population in the lake (a stock). We can represent these two variables graphically.

In this model we have included two additional variables: an inflow of births per year and an outflow of deaths per year. Both of these variables are a proportion of the fish population (note the feedback loops and compounding fractions). We can also see that **a stock can have more than one outflow (or inflow)**.