Name: _____

Flood Awareness
## Flood Prediction Science Notebook Page

Floods can be predicted by scientists to help mitigate the effects the flood has on a city and its' people. How do you think scientists predict floods? What information do you think is most useful for scientists to be able to predict flooding and where it will happen?

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The **amount of rainfall** occurring on a real-time basis is one of the simplest data points a scientist needs in order to predict where a flood could occur. Meteorologists and hydrologists use a tool known as an ombrometer or rain gauge to gather and measure the amount of liquid precipitation at a specific location during a predefined period of time.

Meteorologists and hydrologists also study the **rate of change in river stage** (the height of the water above a decided upon altitude) on a real-time basis. This can help indicate the severity and immediacy of the threat. Scientists use a tool called a hydrograph to help visualize and analyze the streamflow in rivers (the volume of water flowing past a particular point) and the river stage. This data is collected using a stream gauge (pictured below).
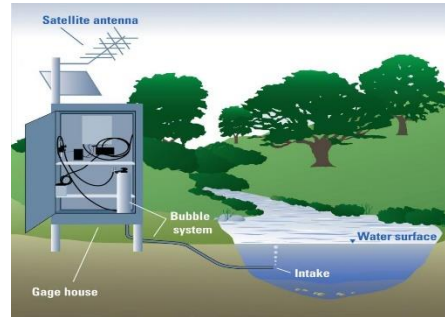
General storm knowledge is another important piece of data scientists need in order to successfully predict the severity of a flood. This information generally includes: duration, intensity, and areal extent, which can be valuable for determining possible severity of the flooding. This information can be obtained through the use of weather stations (left picture below), which collect data on land and sea, and weather balloons (right picture below), satellites and radar, which collect data in the atmosphere.

It is also really important for meteorologists and hydrologists to have **knowledge about the characteristics of a river's drainage basin**. A drainage basin is the area of land where precipitation collects and runs into the river. Some of the important characteristics scientists most commonly look at are the soil-moisture conditions (how much moisture the soil can hold before it cannot hold anymore), ground temperature, snowpack (how thick the layers of compacted snow are- measured at weather stations, pictured bottom left), topography, vegetation cover, and impermeable land area (land surface that cannot absorb water such as pavement – pictured bottom right), which can help to predict how extensive and damaging a flood might become.

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Flood Prediction Data:

Look at the following data. Is this enough information to safely predict a flood? If yes, how do you know? If no, what other information do you think you'll need to predict a flood?

Liquid precipitation:	22.3 in
Soil-moisture conditions:	65%
Impermeable land area:	50 square miles

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