# Weather Express

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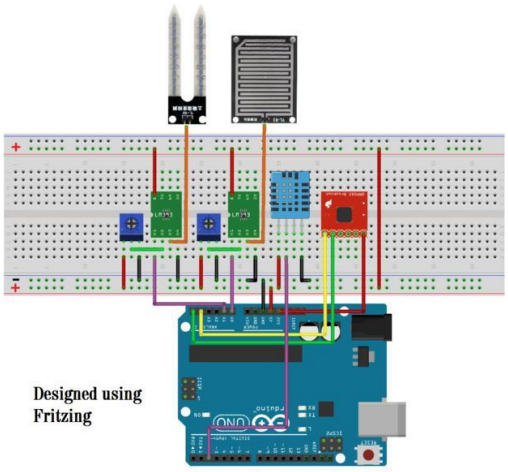
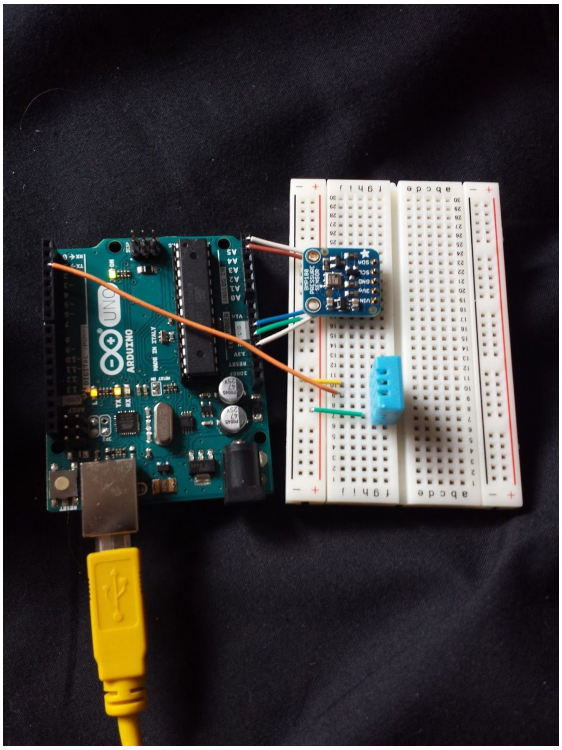
# Abstract

Over the past 30 years the scientific community has been coming out with more and more research  showing the ever continuing escalation of global warming and it's effects on communities worldwide. Over the past few weeks, the Weather Express group has been pushing to develop a new and innovative technology that will create a new point of access to climate research for people ranging from outdoor enthusiasts to fortune 500 companies looking to better track weather patterns around their systems. Through use of cheap and easy to use open sourced tools, like the Arduino UNO board and Raspberry Pi Weather Express has developed a product that will reshape the nature of environmental research. Using those tools, coupled with available distributed-computing software such as what is offered by Amazon Web Services the Weather Express team expects to join together open-sourced technologies with environmental research and climate activism.

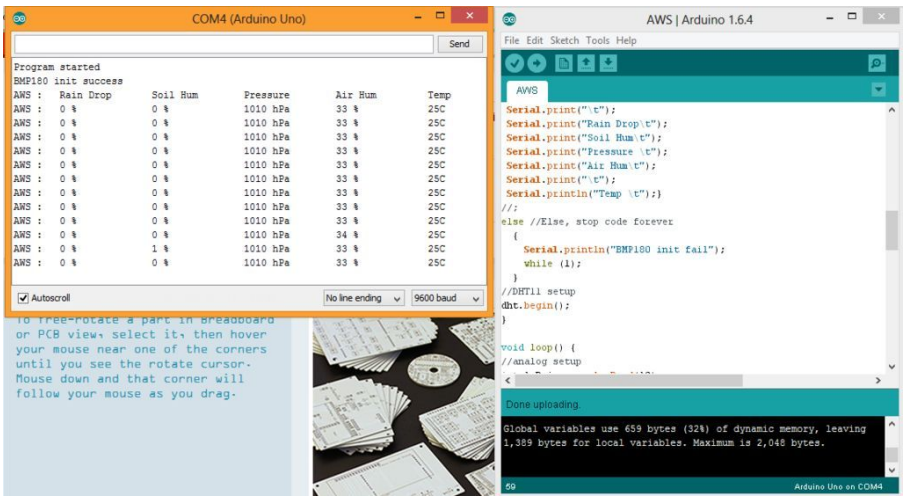
Weather Express is designed to integrate the Arduino UNO board along with multiple environmental sensors to send data to a Raspberry Pi (and in turn an AWS server) for users to analyze and manipulate. Using multiple different sensors which can all be found on various sites such as AdaFruit, the Weather Express is able to integrate multiple different monitors to a single system, ensuring accurate results. Sensors such as the BMP-180 Barometric and Altitude sensor use gauges on the chip which when given altitude input can translate multiple weather patterns into a readable barometric reading. To measure temperature and humidity the project is employing the DHT11 sensor. The DHT11 uses varying electrical signals to monitor the atmospheric temperature and humidity and sends the varying electrical signals to the Arduino which translates the data into readable alphanumeric characters. Additional devices such as a raindrop sensor which has a grid circuit design who is jumped when it comes into contact with raindrops. When that happens it sends the signal to the Arduino which again sends the data to the Raspberry Pi for transmission to



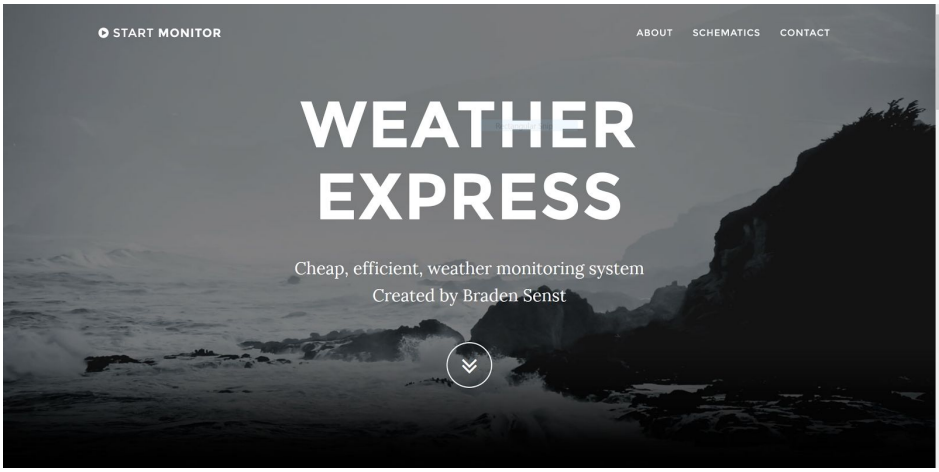
the cloud. There are plenty of other sensors that can be plugged in and out depending on the needs of a client. There are libraries on the arduino which allow for the use of varying sensors which can be changed and used depending on the scenario. Once the data gets to the arduino the software reads the electrical signals and translates them to readable data in the form of an array which is then uploaded to an Amazon EC2 instance where a user can log on and access the data.

The importance of using the technologies that Weather Express is choosing to use is that it ensures that users in the future can continue developing and innovating the field of environmental research using their own passion and ideas. Using a primarily open-source platform and licensing the product and it's software under open-source licenses allows for a community of citizen scientists, outdoor enthusiasts, and academic researchers can build a strong community around improving the system and building up a brand new future of weather research.




Weather express is designed for a user that doesn't have enough money to buy traditional weather monitoring systems. These systems often range in price from $600 to over $2000. These systems are expensive simply due to the laws of supply and demand. They are in a very specialized market which there is not a lot of money or time

spent in development. Companies who build these technologies aren't interested in lowering the price of their products because there is no reason for them to, they make plenty of money as is. Luckily there is another reason beyond price, as to why Weather Express is going to revolutionize the market. The ability for Weather Express to connect users and their data together is something that every other product currently on the market lacks. People today are, now more than ever, looking to connect. To ensure that they are able to do that is paramount to the success of Weather Express. Once people are able to come together to make large maps of weather patterns, they will be able to grow a community of dedicated researchers.




With global warming increasing the effects and severity of worldwide weather patterns it is becoming more and more important to have a better and more thorough understanding of the environment. Every year, as more and more land and sea ice melts and as the sea level rises higher and higher, more and more coastal communities will be threatened directly by global warming. They will continue to sink deeper and deeper until they are completely submerged by the ocean. With technologies like Weather express, the worldwide community of researchers and

concerned citizens can start working together to try and gain a better understanding of the world we inhabit and what steps can be taken to save what we have left.

# References

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