



The Effects of Precipitation on the Salinity of the Amazon River's Discharge Area

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Environmental Science: Hydrology and Limnology

Introduction

The Amazon River is the greatest river of South America, and it also has the greatest discharge on the planet (About the Amazon). This is represented by the volume of flow of the basin. The Amazon River is 4,000 miles long. Sediment pours into the sea each day and it is moved north by coastal currents. The flow of the river is 7,628,000 feet cubed per second with a width a little over a mile and a depth about 150 feet in some parts. The average velocity of the Amazon River is about 1.5 mph which increases during floods (Hydrology of the Amazon River). The rise and fall of the water are contributed from the seasonal rainfall. The floods are caused by rainfall from April to July. The floods increase the river about 40 to 50 feet above the river baseflow. The climate of the Amazon is warm, humid, and rainy. The main part of the water vapor that comes into the basin is from the east with half of the precipitation that falls originating from the Atlantic Ocean. The other half comes from evapotranspiration which is from the rainforest and the storms. Rainfall is approximately 60 to 120 inches each year in the basin. The June to November period allows for water vapor to stay in the basin because of the high altitude of the Andes Mountain Range. The mountains receives upwards of 140 inches of rainfall per year, which feed the Amazon River (Hydrology of the Amazon River). The increase in precipitation increases the discharge of the river (Gouveia). The river can be a signal for what is happening in the Amazon. This research focuses on this topic because it could indicate what is happening to the Amazon such as deforestation which can harm people in return since the rainforest takes in carbon dioxide and produces oxygen.

Hypothesis

I hypothesize that the higher amount of rainfall during the wet months compared to the dry months will cause the salinity in the discharge area of the Amazon River to decrease because of the increase of freshwater input.

Methods

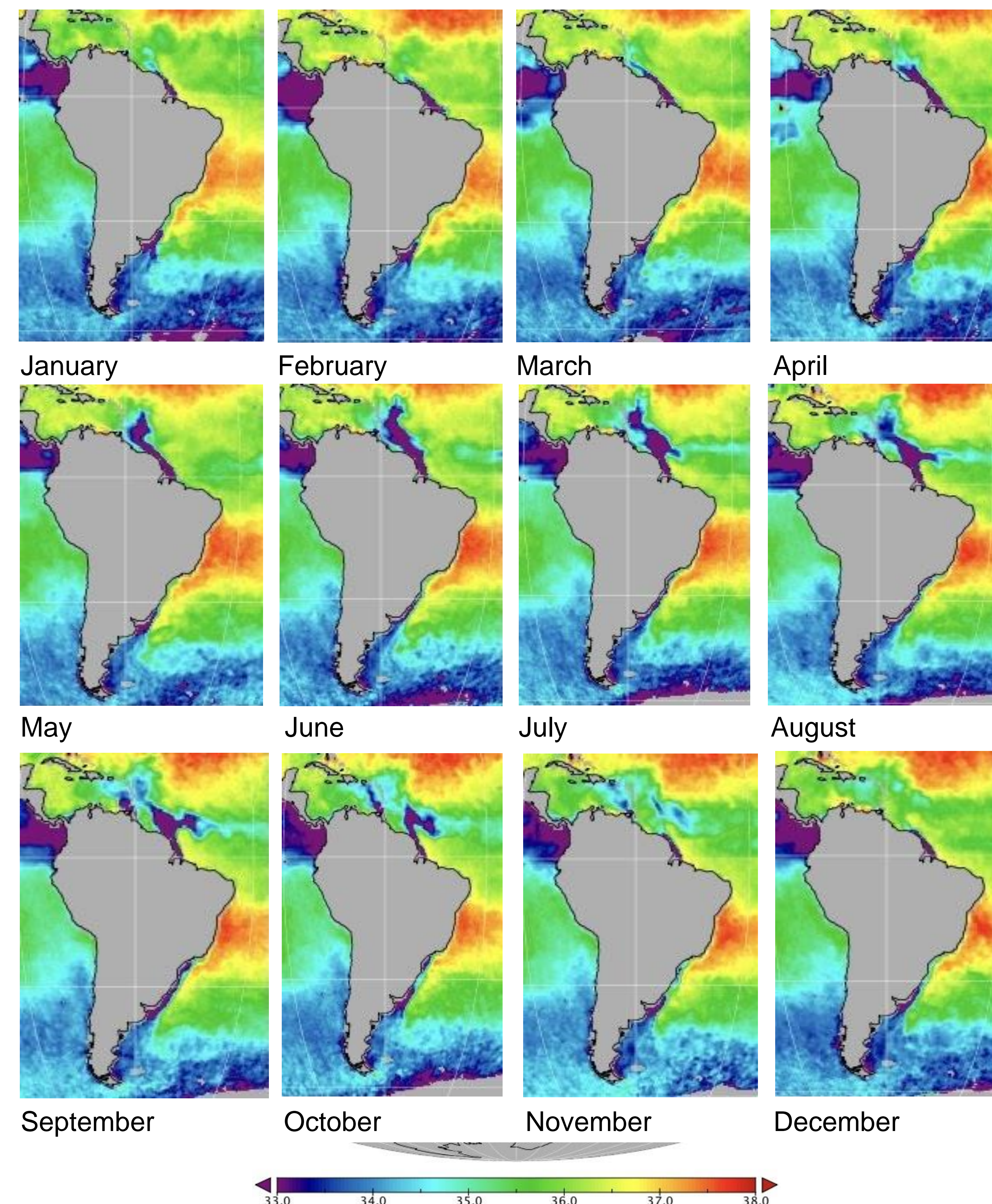
The Amazon basin flows into the main river and then to its discharge area into the Atlantic Ocean. I looked at the data for the precipitation of the Amazon rainforest and the data for the surface salinity of the discharge area or mouth of the Amazon River. I looked at the correlation between the amount of rainfall during the wet and dry seasons affecting the discharge of water which in turn affected the salinity of the Amazon River's discharge area.

Results

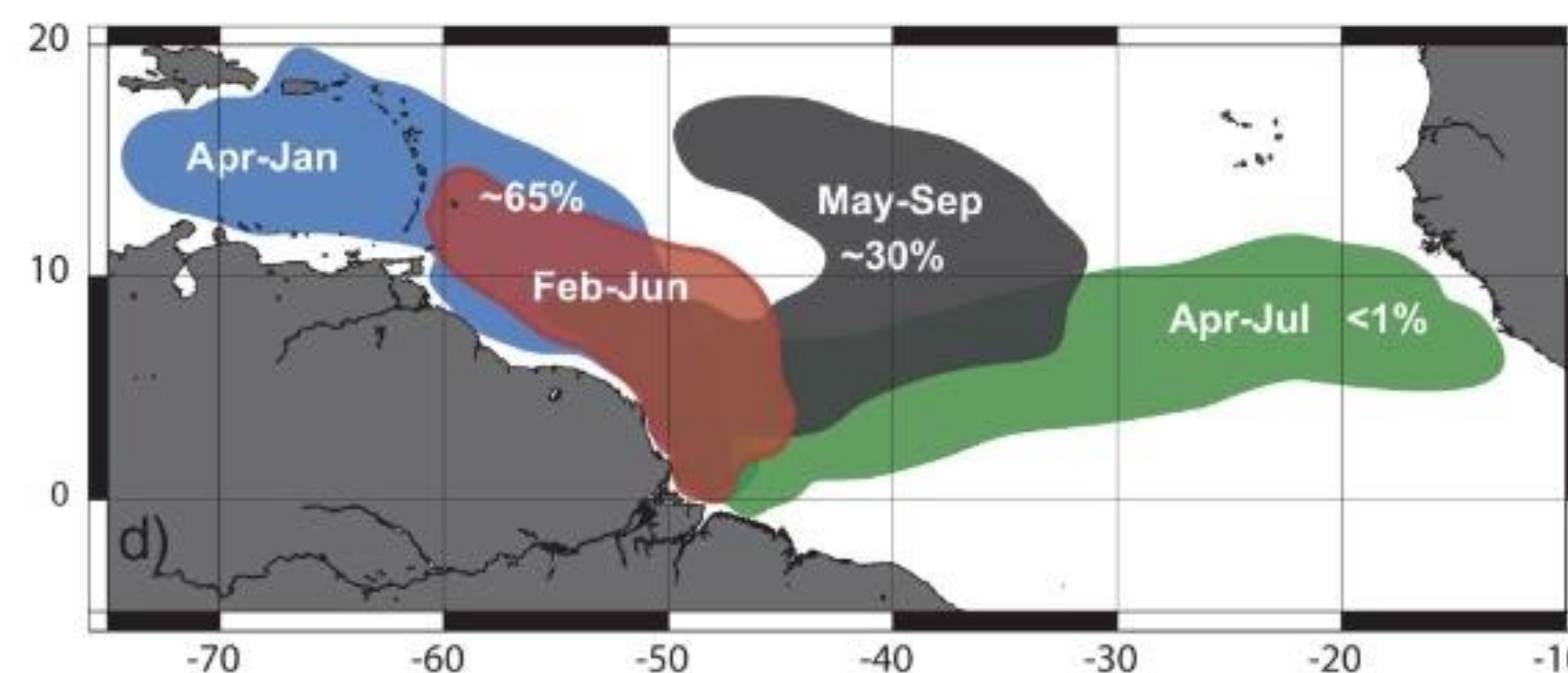


- This image depicts the rivers which flow into the Amazon River and then to the Atlantic Ocean.

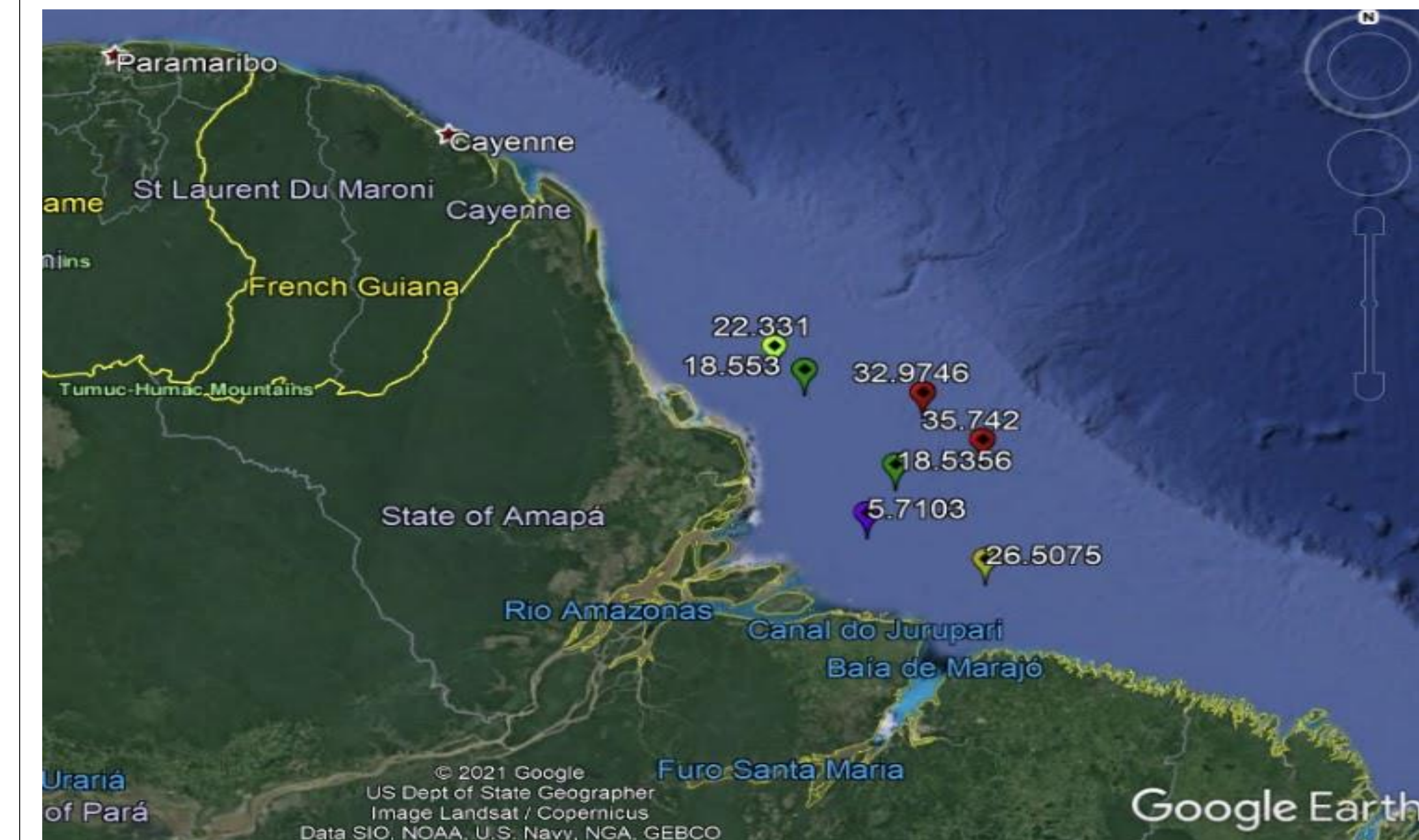
Images of Nasa Satellite Surface Salinity for each month in 2018



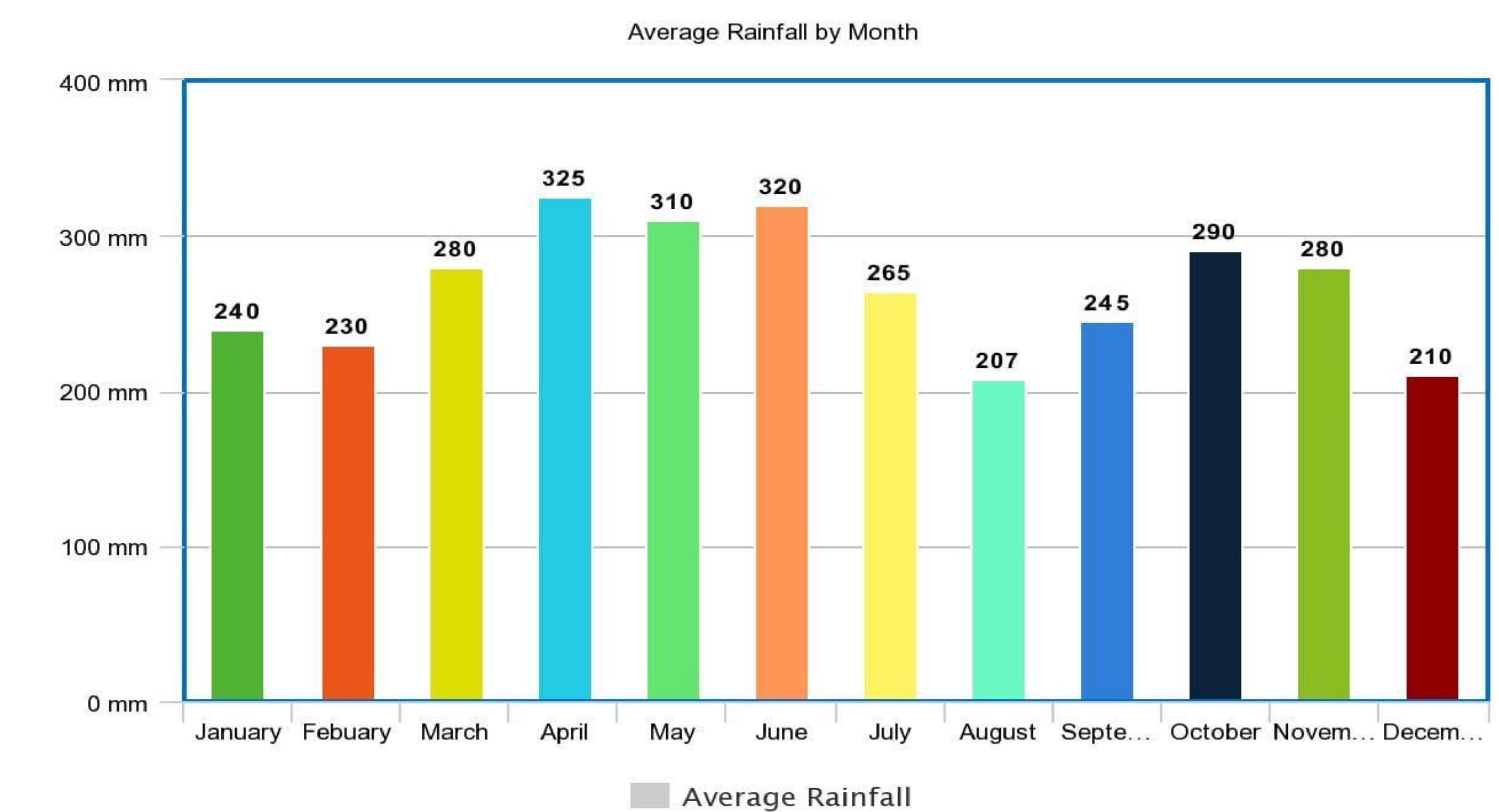
- The scale above is surface salinity. The purple end is low salinity, and the red end is high salinity.
- The change of surface salinity happens by the mouth of the Amazon River which is Northeast of South America.
- The surface salinity decreased from April to October.



- This image represents where the discharge from the Amazon River gets carried to after it enters the Atlantic Ocean.
- Each color is divided into the percentage of discharge that gets carried by the ocean currents for a specific span of months.



- This picture depicts the salinity values at a certain longitude and latitude around the mouth of the Amazon River or discharge area.



- This graph is from Ecuador and Galapagos insider website showing the average monthly rainfall for the Amazon Rainforest (Ecuador Amazon).

Conclusion

The results show a direct correlation between the amount of rainfall per month for wet or dry months and the level of surface salinity at the mouth of the Amazon River. When there is an increase of precipitation over the Amazon Rainforest, there is an increase in the amount of discharge and a decrease in surface salinity around the mouth since there is an increase in freshwater from the river into the ocean. Previous data shows that there is a difference in precipitation during the wet and dry months that leads to a different amount of discharge from the Amazon River.

Sources

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