ARE THE LAKES RISING AS A RESULT OF WEATHER PATTERN CHANGES IN THE REGION?

From 1984 until 1997, Lake Azuei experienced sustained periods of lake level rises followed by short periods of lake level drops (Fig. 6). During these same short periods, Lake Enriquillo experienced very little lake level rise. Between 1997 and 2013, Lake Enriquillo experiences three of its most dramatic growths directly following significant lake level drops at Lake Azuei (Fig. 6). 1997, Lake Azuei appears to act as an upstream dam that opens (loses large volumes of water to Lake Enriquillo) and closes (retains its water) at different times as lake levels change (Fig. 5, 6).

Highly salinity water generally correspond to lower lake level elevations in Lake Azuei (Fig. 6). 2007 and 2013 indicate that mostly fresh water has been introduced into the lakes since 2005. This indicates that the Caribbean Sea is unlikely to be contributing large volumes of water to Lake Enriquillo.

DOES THE CARIBBEAN SEA PLAY A ROLE?

Changes to a wetter climate may be the only cause of the recent 10 and 5 m rise in Lake Enriquillo and Lake Azuei’s water levels respectively.

Lakes Enriquillo and Azuei have risen following a 211 mm/yr increase in precipitation (2005-2013) and following at least 7 storms (Fig. 5). However, weak correlations (0.1 and 0.06 respectively) between lake levels, and precipitation rates, along with high volumes of water required from the drainage basin to fill Lake Enriquillo (2006-2012) (Fig. 5, 6) imply that weather patterns are unlikely to be the sole cause of the recent lake levels.

Conclusions:

Lake Enriquillo may have experienced hydrologic connections to the Caribbean Sea, as shown by significant drops in lake levels correlated with rising water levels in the Caribbean Sea.

Lake Enriquillo is a unique case study and should be further investigated as a potential water source for Lake Azuei.

ACKNOWLEDGEMENTS AND REFERENCES

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Lakes Enriquillo and Azuei, the two largest lakes in Hispaniola and the Caribbean, have risen 10 and 5 m respectively within the last 8 years. Higher lake levels have submerged towns, road systems, and agricultural areas.

The lakes are responding to weather and climate pattern change in the region. Important areas of research include: hydraulic connectivity between lakes during the 2005-2013 rise, historical connectivity across the drainage basin, and the contribution of the Caribbean Sea to the recent rise in Lake Enriquillo.

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