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[\[International Cooperation\]\[Earth Sciences\] NTU Department of Geosciences' Research on Sinuosity of Meandering of the Rivers in North Pacific Published in 《Science》](#)

[International Cooperation][Earth Sciences] NTU Department of Geosciences' Research on Sinuosity of Meandering of the Rivers in North Pacific Published in 《Science》 ([Chinese Version](#))

NTU Newsletter (Issue 999) The famous international journal Science published on March 18 the research result of a team consisting of members from Department of Geosciences, NTU, and Columbia University (US), Cambridge University (UK), Tokyo University (Japan), etc. The research result indicates that Taiwan's rivers have the second highest sinuosity of meandering in the North Pacific area, with an average value of 1.4, second only to the Luzon Island of the Philippines, because of its high frequency of heavy rainfalls and flood. And the Zuo-Kou River at the upper reach of the Lao-Nung River, has a sinuosity in excess of 2.0, which is most certainly the river with the highest sinuosity.

Professor Hongey CHEN of the Department of Geosciences, NTU, points out that, this internationally cooperated research project was geared toward studying the phenomenon of meandering change in the rivers in Japan, Taiwan, Philippines, Borneo, New Guinea (all in the North Pacific Region) to find evidence determining whether climate or geological environment played a role in the sinuosity of the rivers. The research primarily used a meandering degree grid, as well as the monthly average rainfall records, and the probability density function of typhoons, to study the correlation between the rivers sinuosity and the climate.

The results of the research suggests that the the amount of rainfall and the intensity of the floods are significant factors of the rivers' sinuosity basically. Because of the high frequency of monsoon, typhoon and the intensity of flood, Taiwan, Luzon (in Northern Philippines) and the Kyushu Island of Japan (in Southern Japan) are areas with rivers of high sinuosity of meandering. Around the Equator and middle latitude regions, where there are fewer storms and fewer floods, the sinuosity of the rivers are also less.

The results of this research tells us that, although the North Pacific Region is affected by the tectonic plates, but the influence of crustal uplift rate on the sinuosity of rivers meandering is less than that of the climate. For instance, the crustal uplift rate of Luzon island is -1mm per year, relatively lower than that of Taiwan (-6mm per year), but, because the frequency of typhoon and the intensity of floods in that area are higher than those in Taiwan, therefore Luzon Island has a higher degree of river meandering, averaging 1.5. Taiwan has the second highest sinuosity of river meandering, averaging 1.4. However, the Zou-Kou River in the upper stream of the Lao-Nung River in Southern Taiwan, owing to the intensity of the flood and to the broken conditions of the rock layers, has a sinuosity in excess of 2.0, which is the highest in North Pacific Region. Basically, the rivers with high sinuosity of meandering are spread between 8 and 25 degrees of latitude. This result shows the importance of climate, since the atmospheric circulation in this area is associated with the steering effect, and has a close corresponding relationship with the frequency of typhoon strike.

The published paper was the result of international research cooperation among National Taiwan University, the Columbia University of US, the Tokyo University of Japan, and the Cambridge University of UK. It also received support and funding from the National Aeronautics and Space Administration (NASA) of United States, the National Science Foundation of U.S., the National Science Council of Taiwan, and the Water Resources Agency of the Ministry of Economic Affairs. Aside from Dr. STARK of Columbia University and Profess Hongey CHEN of National Taiwan University, other major participants in the research include Dr. BARBOUR from Columbia University, Professor HOVIOUS from Cambridge University, Professor HAYAKAWA from Tokyo University, Professor HITTANJI and Professor XU from Sapporo University, Professor FUKAHATA from Kyoto University, Professor Ching-Weei LIN from National Cheng-Kung University, and Dr. Ming-Jame HORNG of the Water Resources Agency.

Reference:

[NTU Newsletter Issue 999](#) (Chinese)

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