Long-term SST Prediction Based on RSST-ARGM

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Abstract

For the purpose of exploring the long-term variation of regional SST, this paper studies the historical SST in local sea areas and the emission pattern of greenhouse gases and proposes a gray model of regional SST based on atmospheric reflection which can be used to predict SST variation in a long time span. By studying the grey systematic relationship between historical SST data, the model obtains the development law of temperature change, and further

introduces different future greenhouse gas emission scenarios as the index coefficient to determine the corresponding changing results of seawater temperature in the next 50 years. Taking the North Atlantic Ocean as an example, the cosine similarity test method is used to verify the model proposed in this paper, and its accuracy is as high as 0.99984. The model predicts that the local SST could reach a maximum of 15.3°C by 2070. This model is easy to calculate, with advantages of the high accuracy and good robustness.

Full-text

Due to technical limitations, full-text HTML conversion of this manuscript could not be completed. However, the manuscript can be downloaded and accessed as a PDF.

Figures

Figure 1

The results of model (left is the real situation; right is the model result) Note: The designations employed and the presentation of the material on this map do not imply the expression of any opinion whatsoever on the part of Research Square concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. This map has been provided by the authors.

Figure 2

The regional SST in 2070 Note: The designations employed and the presentation of the material on this map do not imply the expression of any opinion whatsoever on the part of Research Square concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. This map has been provided by the authors.

Figure 3

The results of SST changes under the influence of different RCPs

Figure 4

BP neural network structure diagram