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**Netra P Khanal\***, 401 W. Kennedy Blvd., Tampa, FL 33606. *Differential Equation Model for Carbon Dioxide Emission and the Impact of Major Contributors*. Preliminary report.

Solid, liquid, and gaseous fuels are considered to be major contributors to the emission of carbon dioxide in the atmosphere—the one that causes Global Warming. In this study, we develop a differential equation to model carbon dioxide emission while considering the impact of major contributors as an input function. The input function is estimated using a differential operator as data smoother and penalized least square criteria is implemented to select a model using functional data analysis techniques. The proposed model is applied to the historical data of carbon dioxide emission and its most significant constituents in the continental United States from 1882 to 2014. The data is obtained from the Carbon Dioxide Information Analysis Center (CDIAC), the primary climate change data and information analysis center of the United States Department of Energy. The proposed model is expected to be useful to understand the dynamics of major attributing variables and their impacts on the rate of change of carbon dioxide emission. (Received September 12, 2019)