User Manual

1. InMAPv1.6.1-China development description

To rapidly predict the air quality and to estimate the health impacts of emission sources in China, based on the published InMAPv1.6.1 model (available at *https://github.com/spatialmodel/inmap*), the localized version over China of the reduced-complexity model (InMAPv1.6.1-China) was established. A preprocessed interface to calculate physical and chemical process parameters using the WRF-CMAQ output variables was developed to support the simplified simulation in InMAP-China. The air pollutant emission data are preprocessed to an appropriate format for the InMAP-China simulation. The exposure-response function of the GEMM model is employed in InMAP-China to assess $PM_{2.5}$-related health impacts. The modeling system is applied over mainland China for 2017 under various emission scenarios to examine model performance.

More details can be seen in our paper " Reduced-complexity air quality intervention modeling over China: development of the InMAPv1.6.1-China and comparison with the CMAQv5.2 model".

2. How to compile and run " InMAPv1.6.1-China"

Download the source code and related data of InMAPv1.6.1-China model at Zenodo. The module can be run on the Linux server.

2.1 Compile

The compile command can be seen in https://github.com/spatialmodel/inmap. Please install the Golang compiler first and then insert the command as follows,

export InMAP_ROOT_DIR=/data/home/wuruili/WORK/11.InMAP/inmap161_China

export GOPROXY=https://goproxy.io

GO111MODULE=on go build ./cmd/inmap

2.2 Run

2.2.1 Job submission

Inmap161_China/.csh* is the job submission script.

0.preproc.csh is used to preprocess CTM data input parameters required by InMAP-China (here, the newly added *wrfcmaq_wrl.go* is the key script to calculate physical and chemical process parameters in this running).

1.grid.csh is used to create the grid file for simulation.

2.InMAP_run.csh is used to submit the main job to predict $PM_{2.5}$ concentrations using InMAPv1.6.1-China.

The parameter configuration for *2.InMAP_run.csh* can be modified in */inmaputil/cmd.go* or the config.toml file.

2.2.2 Input and output data description

In the directory */China/input*, the emission input (the demo of emission data for five emission sectors in the year 2017 in China are provided), population, baseline mortality rate data are contained and all files are converted into a vector format.

In the directory */China/output_demo*, the demo of output file for a testing case is presented.

2.2.3 Additional module description

In the directory *0.wrfcmaq2inmap/*, the output variables derived from WRF-CMAQ model can be combined and processed and output data required in the running of 0.preproc.csh.

In the directory *health_gemm/*, the $PM_{2.5}$-related premature deaths can be further calculated.

More details on can also be seen in *https://github.com/spatialmodel/inmap*.