Notes on NOxmultibox\_forestmodel:

The code is written for MATLAB. It should be run and initiated by running the script NOxmultibox\_forestmodel. The following describes the script and functions included. Further documentation can be found at the beginning of each script or function.

These below files should be modified by the user prior to running NOxmultibox\_forestmodel:

**NOxmodel\_config**: contains parameters to change prior to running NOxmultibox\_forestmodel

**pathfile**: contains the path for where the model is kept by the user. Specifies location of model scripts.

**figures\_Noxbox**: this is left blank for the user to specify which figures the model should print.

These following files can be edited if needed, but are not necessary to change. They are necessary to run the model:

altitudeTemp, d\_Chemistry, deposition, emit\_BVOC, gpot, met\_diurnal, NOxadvec, PBLdynamics, ppbconv, soil\_NO, timehr, tstep, VertK, yesno, photolysis , timesteptohr, BEARPEXgst, PPFD, Jphoto

There are also two necessary folders:

**Rates\_051816**: containing functions for rate constant used in the model

**sun\_azimuth\_data:** containing code for solar zenith angles based on time and location, Copyright (c) 2004, Khalil Sultan

The model produces a time series of the following matrices of the form nboxes x nsteps:

box — heights of the tops each box

eBVOC — emission of BVOCs

LDepNOx — loss rate of NOx to deposition

LHNO3 — loss rate of NOx to HNO3 formation

LRONO2 — loss rate of NOx to alkyl nitrate formation

LPAN — loss rate of NOx to PAN formation

concentrations of the following species in molecules/cm3/s: CH2O, CH3, CH3CHO, CH3COO2, CH3O, CH3O2, CH3O2, CH3OOH, H2O2, HO2, N2O5, NO, NO2, NO3, O3, OH, PAN, RO2, VOC, tracer