



Supplement of

Implementation of Yale Interactive terrestrial Biosphere model v1.0 into GEOS-Chem v12.0.0: a tool for biosphere–chemistry interactions

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4 Supplementary Information

Table.S1 The coefficient a of O₃-damaging sensitivity for a specific PFT.

PFTs	a for high sensitivity	<i>a</i> for low sensitivity
	$(mmol^{-1} m^{-2})$	$(mmol^{-1} m^{-2})$
Evergreen broadleaf forest	0.15	0.04
Evergreen needleleaf forest	0.075	0.02
Deciduous broadleaf forest	0.15	0.04
Shrub	0.1	0.03
Tundra	0.1	0.03
C ₄ grasses	0.735	0.13
C ₃ grasses	1.4	0.25
C ₃ crops	1.4	0.25
C ₄ crops	0.735	0.13

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18 Table S2. The conversion relationships between YIBs and GEOS-Chem deposition

19 land types.

Evergreen broadleaf forest Evergreen needleleaf forest	
Evergreen needleleaf forest	Amazon forest
	Coniferous forest
Deciduous broadleaf forest	Deciduous forest
Shrub	Shrub/grassland
Tundra	Shrub/grassland
C ₄ grasses	Shrub/grassland
C ₃ grasses	Shrub/grassland
C ₃ crops	Agricultural land
C ₄ crops	Agricultural land



Figure S1 Fractional coverage of each land type at each grid cell.



Figure S2 The major dry deposition land type at each grid cell converted from YIBs
land types. DF, CF, AL, SG and AF represent deciduous forest, coniferous forest,
agricultural land, shrub/grassland and amazon forest, respectively. Black dots indicate
the locations of measurement sites used in evaluation (Table 2).





Figure S3 Comparison of YIBs and Olson land types. (a) and (b) represent the
simulated MDA8 [O₃] using YIBs land types and Olson land types, respectively. (c)
represents the simulated MDA8 [O₃] difference between YIBs and Olson land types.



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Figure S4 Summertime mean surface O₃ concentrations from simulations (a), observations (b), and their differences (c) averaged for period of 2010-2012. Global area-weighted surface O₃ concentrations over grids with available observations are shown on the title brackets. The correlation coefficient (R), global normalized mean biases (NMB), and grid numbers (N) with observations are shown in the bottom figure.



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Figure S5 Simulated annual isoprene (a) and NO_x (c) emissions from online GC-YIBs

model and its changes (b-d) caused by coupled LAI averaged for period of 2010-2012.



Figure S6 Observed and simulated diurnal cycle of O₃ dry deposition velocity over Amazon (a-c), coniferous (d-h) and deciduous (i-o) forests. The black lines represent observed O₃ dry deposition velocity. The blue and red lines represent simulated O₃ dry deposition velocity from GC (Offline simulation) and GC-YIBs (Online_ALL simulation) models, respectively.



Figure S7 Comparison of MDA8 $[O_3]$ simulated with low $(4^\circ \times 5^\circ)$ (a) and relatively

high $(2^{\circ} \times 2.5^{\circ})$ (b) horizontal resolutions. (c) represents the MDA8 [O₃] difference between low and high resolutions (a-b).