

Nutrient limitation on land: how accurate are our global land models?

15-17th June 2016, Yangling, Shaanxi, China

Organizing committee

Dr. Ying-Ping Wang (CSIRO, Australia) (Chair)

Dr. Philippe Ciais (LSCE, France)

Prof. Yiqi Luo (University of Oklahoma, USA)

Dr. Shuli Niu (Chinese Academy of Sciences, China)

Prof. Josep Peñuelas (CREAF, Spain)

Dr. Sara Vicca (University of Antwerp, Belgium)

Prof. Shiqiang Wan (Henan University, China)

Dr. Sönke Zaehle (MPI, Germany)

Prof. Baoyuan Liu (Northwest A&F University, China)

Prof. Changhui Peng (UQAM, Canada and Northwest A&F, China)

Host Institution

State Key Laboratory of Soil Erosion and Dryland Farming on the Loess Plateau, Northwest A&F University

Sponsors

Institute of Water and Soil Conservation, Northwest A&F University

Laboratory for Ecological Forecasting and Global Change, College of Forestry, Northwest A&F University



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Agenda

Day 1: 15th June

Workshop opening (9:00 to 9:30 am) (Chaired by Dr. Ying-Ping Wang):

- 9:00 – 9:10 *Professor Jun Luo*: Vice-president of the North-west Agriculture and Forestry University
- 9:10 – 9:25 *Professor Baoyuan Liu*: Welcome and Introduction of Research at the State Key Lab
- 9:25 – 9:30 Group photos

Overview talks (9:30 to 10:30) (Chaired by Dr. Ying-Ping Wang)

- 9:30 to 9:50 *Philippe Ciais*: objectives of this workshop
- 9:50 to 10:30 *Josep Peñuelas*: A few key questions on terrestrial nutrient limitation in an earth system context
- 10:30 to 11:00 Morning Tea Break

Nutrient modeling (Chaired by Professor Changhui Peng)

- 11:00-11:30 *Benjamin Houlton (via Skype)*: Isotopic constraints on the global nitrogen cycle
- 11:30-12:00 *Qing Zhu (via Skype)*: Soil nutrient partitioning among plants, microbes, mineral surfaces: existing theories, observational support and model benchmarking
- 12:00-12:30 *Colin Prentice*: A plant-centred approach to modelling carbon-nitrogen interaction
- 12:30-13:00 *Benjamin Sulman*: Connecting plant nitrogen acquisition to soil microbial activity in the GFDL land model
- 13:00 to 14:00 Lunch break
- 14:00-14:30 *Daniel Goll*: P cycle in ORCHIDEE: major challenges
- 14:30-15:00 *Qiuhan Zhu*: Modeling the interaction of C and N in terrestrial ecosystems with the process-based TRIPLEX-GHG model

- 15:00-15:30 *Ying-Ping Wang*: Evaluating global nutrient cycles, available data and key challenges
- 15:30-16:00 *Sönke Zaehle*: How can we use ecosystem manipulation experiments to improve ecosystem models
- 16:00-16:30 *Shushi Peng*: Simulated interactions between carbon and nitrogen in ORCHIDEE, and possible improvements
- 16:30-17:30 *Breakout session* led by Ying-Ping Wang and Sonke Zaehle
- 17:30-18:00 *Summary*

19:00 *Conference Dinner: A dinner speaker by Professor Hao Feng ,Deputy Director of Institute of Water and Soil Conservation at Northwest A&F*

Day 2: 16th June

Observations (chaired by Professor Yiqi Luo)

- 9:00-9:40 *Sune Linder*: Climatic and nutritional constraints to carbon sequestration in northern coniferous forests
- 9:40-10:20 *Yongfei Bai*: Testing the mechanisms of N-enrichment-induced changes in biodiversity and ecosystem functioning in an Inner Mongolia grassland
- 10:20-10:50 *Tea break*
- 10:50-11:20 *Richard Norby*: The NGEE-Tropics field campaign to inform the ACME Land Model Phosphorus module
- 11:20-11:50 *Shiqiang Wan*: N losses induced by wind erosion in the arid and semiarid regions of Northwest China
- 11:50-13:00 *Lunch break*
- 13:00-13:30 *Yuting Fang*: Historical change in N limitation in forest ecosystems at a global scale
- 13:30-14:00 *Jiangyang Xia*: Temporal trend in China's soil N availability during the last three decades
- 14:00-14:30 *Shenglei Fu*: Can canopy addition of nitrogen better illustrate the effects of nitrogen deposition on forest ecosystem?
- 15:00-15:30 *Tea break*
- 15:30-16:30 *Breakout session* led by Sara Vicca, Shiqiang Wan, Shuli Niu, Sonke Zaehle

16:30-17:00 Summary
18:00 Dinner

Day 3: 17th June

Synthesis (chaired by Dr Rich Norby)

9:00-9:30 *Yiqi Luo*: Closing the loop from development to evaluation to improvement with coupled carbon-nitrogen models

9:30-10:10 *Sara Vicca*: Plant carbon allocation responses to changes in nutrient availability: current empirical understanding and future directions.

10:10-10:40 *Xuhui Zhou*: Nitrogen limitation on responses of NPP to global climate change: a meta-analysis

10:40-11:10 *Shuli Niu*: Global patterns and substrate-based mechanisms of terrestrial nitrogen cycle

11:10-11:40 *Han Chen*: Decoupling of nitrogen and phosphorus in terrestrial plants associated with global changes

11:40-12:10 *Zhiyou Yuan*: Ecological stoichiometry in a changing world

12:20-14:00 *Lunch break*

14:00-15:30 *Breakout session* led by Yiqi Luo and Philippe Ciais

15:30-16:30 *General discussion*

16:30-17:00 *Summary*

17:10 *Workshop close*

18:00 Dinner Possible

topics for discussions:

- What we have learnt? And what are the next steps? And what are the low-hanging fruits?
- What data we have can be used for benchmarking nutrient cycles in global land models?

Theme of a synthesis/prospective paper