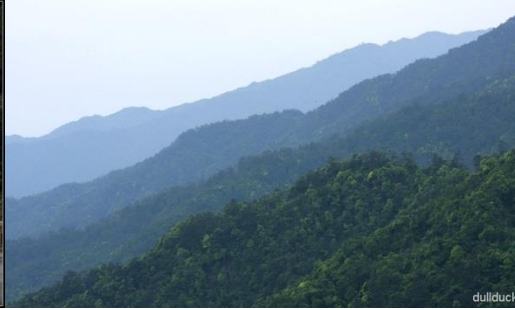




Multiple factors affecting diversity in Chinese forest

Gang Feng
Xiangcheng Mi
Jens-Christian Svenning

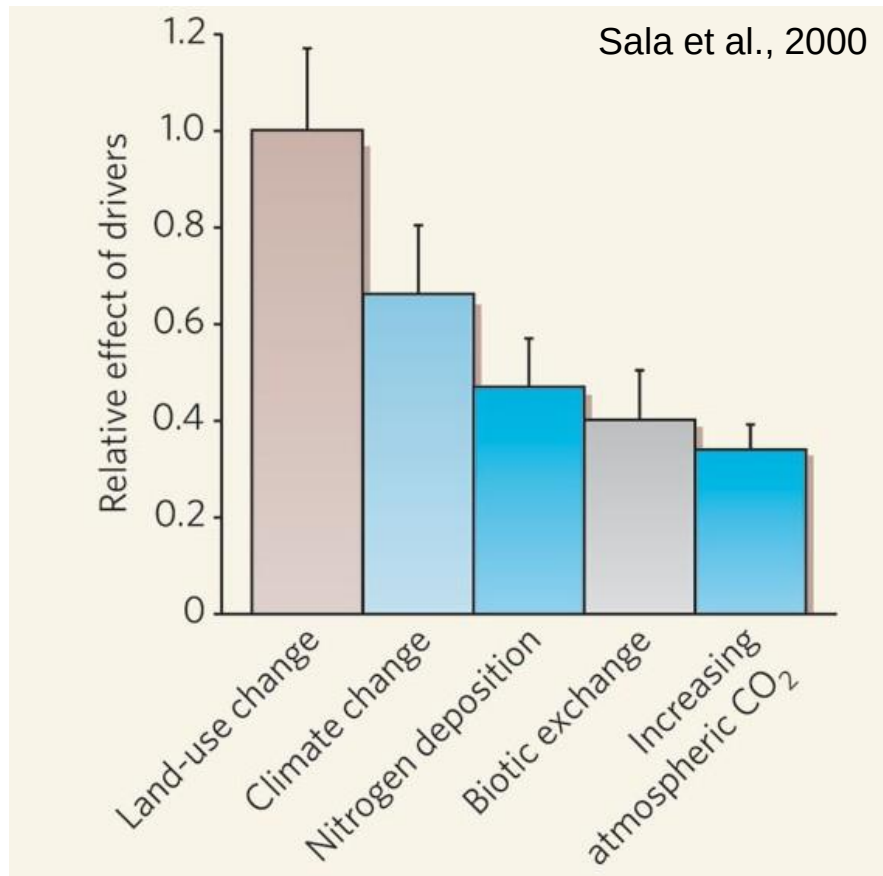


Outline

- Background
- Data & Methods
- Results
- Conclusion



Background – drivers of diversity



Local factors



Biotic:
Competition
Reciprocity
etc.

Abiotic:
Soil
Topography
Light
etc.

Background – different diversity

Species Diversity



Phylogenetic Diversity



Functional Diversity

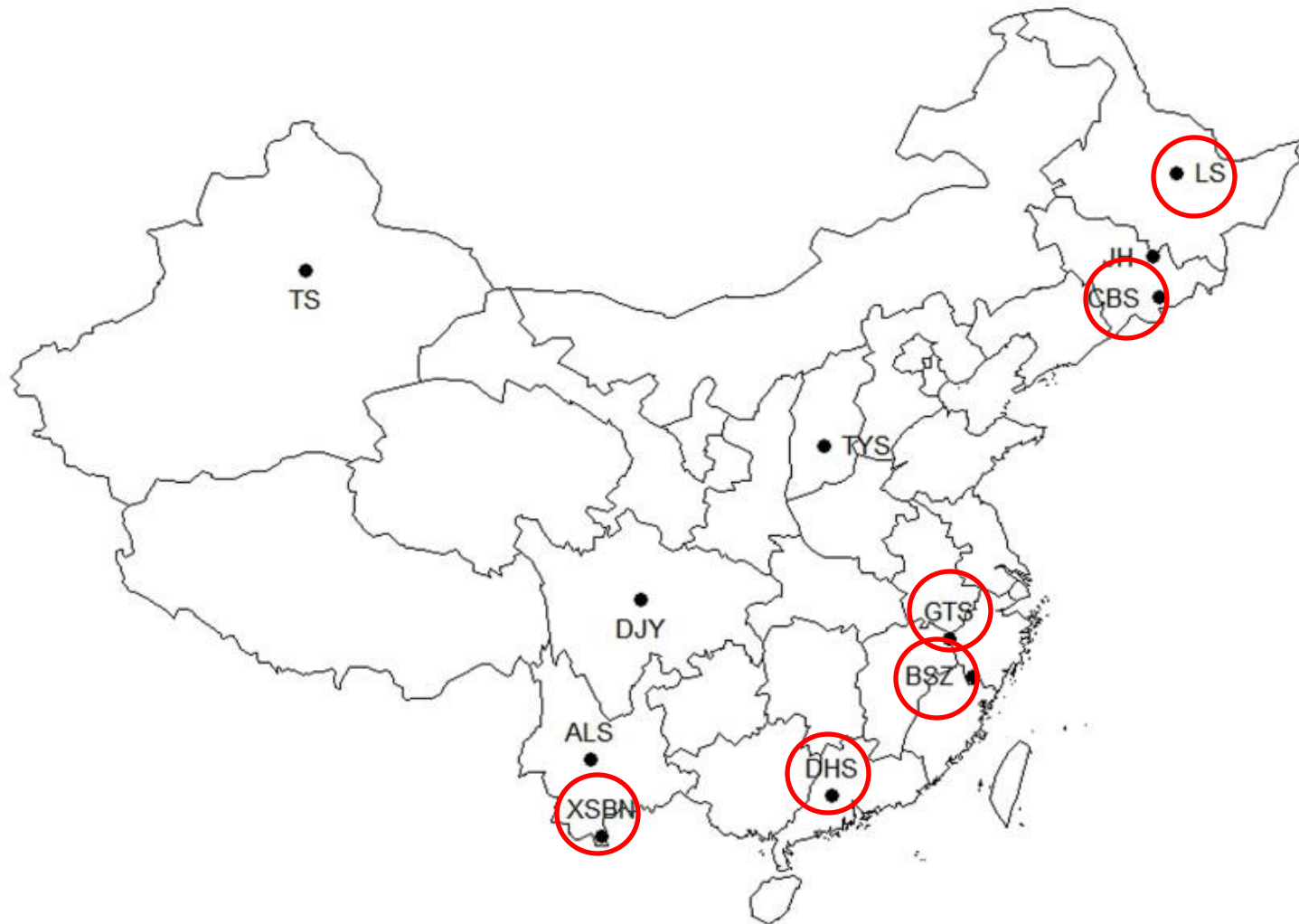


Background – knowledge gap

- Previous studies mainly focus on
 - 1) climate effect on species diversity.
 - 2) local factors (biotic/abiotic) on species, phylogenetic, functional diversity.
- No studies combine climate (current/palaeo) and local factor on phylogenetic and functional diversity.



Data & Methods



Data & Methods

- Species list and abundance.
- Building phylogenetic tree using Phylomatic.
- Building functional (maximum height) tree using clustering method.
- Palaeo and current climate data from WorldClim.
- Local factor is an indicator of disturbance (proportion of light demanding species).



Data & Methods

- Diversity index $NRI = -1 \times \frac{MPD_{obs} - meanMPD_{rnd}}{sdMPD_{rnd}}$
- Correlation between diversity and environmental variables.
- General linear analysis of diversity and environmental variables.
- Akaike weights (w) in all GLMs for each variable



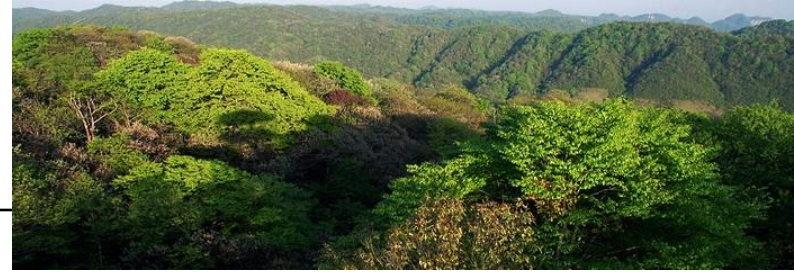
Results - Correlation



r_s	Velocity	Anomaly	MAT	MAP	LDSR	Area
NRI_{FUN_pr}	0.02	-0.04	0.40	0.48	0.64*	-0.40
NRI_{FUN_ab}	0.09	0.08	0.38	0.57	0.65*	-0.51
$NRI_{PHY_ang_pr}$	0.57	0.72*	-0.69*	-0.49	-0.35	0.11
$NRI_{PHY_ang_ab}$	0.61*	0.82**	-0.66*	-0.32	-0.38	0.05
$NRI_{PHY_gym_pr}$	0.32	0.27	-0.13	-0.22	-0.18	0.27
$NRI_{PHY_gym_ab}$	0.45	0.65*	-0.16	0.35	-0.03	0.34



Results - R² of GLM



	Velocity	Anomaly	MAT	MAP	LDSR	Area
NRI _{FUN_pr}	0.00	0.01	0.22	0.34	0.67**	0.08
NRI _{FUN_ab}	0.00	0.00	0.24	0.44*	0.50*	0.06
NRI _{PHY_ang_pr}	0.20	0.45*	0.61**	0.36	0.19	0.08
NRI _{PHY_ang_ab}	0.29	0.59**	0.41*	0.09	0.12	0.03
NRI _{PHY_gym_pr}	0.07	0.13	0.11	0.14	0.07	0.16
NRI _{PHY_gym_ab}	0.24	0.28	0.00	0.13	0.02	0.17





Results – Sum Akaike weights

	Velocity	Anomaly	MAT	MAP	LDSR	Area
$H_{\max_pr}$	0.05	0.05	0.06	0.09	0.95	0.10
$H_{\max_ab}$	0.06	0.08	0.12	0.32	0.54	0.09
$NRI_{PHY_ang_pr}$	0.06	0.52	0.45	0.46	0.06	0.06
$NRI_{PHY_ang_ab}$	0.08	0.82	0.16	0.11	0.18	0.05
$NRI_{PHY_gym_pr}$	0.11	0.15	0.13	0.16	0.11	0.19
$NRI_{PHY_gym_ab}$	0.21	0.33	0.12	0.17	0.08	0.15



Take home message

- Local contemporary is important for functional diversity.
- Palaeoclimate more important for phylogenetic diversity.



Gfö

43rd Annual Meeting of the Ecological Society
of Germany, Austria and Switzerland



September 9 to 13, 2013
Potsdam, Germany

Key notes

Prof. Dr. Fernando Maestre
Universidad Rey Juan Carlos
Móstoles (Madrid), Spain

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Ghent University
Ghent, Belgium

Prof. Dr. David Raffaelli
University of York
United Kingdom

Prof. Dr. Nicole van Dam
Radboud University Nijmegen
The Netherlands

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University of Cambridge
United Kingdom

Prof. Dr. Nelson G. Hairston, Jr.
Cornell University
Ithaca, U.S.A.

Prof. Dr. Lars Tranvik
Uppsala University
Sweden

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Sessions

- Function or Service (12 sessions)
- Webs (10 sessions)
- Diversity (7 sessions)
- Environmental change (8 sessions)
- Water, Macro, Conservation, Invasion.....



Keywords

- Bridge, Across, Link, Combine, Trophic.....
- Time-Spatial scales, diversity-functions, experiment-models, Ecology-Evolution, Spatial scales.....



双清论坛

生物多样性整合研究的关键科学问题

- 科学问题：

1. 生物多样性大尺度格局及其成因
2. 种间相互关系的动态及其进化和生态意义
3. 生物多样性丧失机制及其生态后果

- 关键词：“整合研究”

1. 整合重大的科学问题，生物多样性的形成、维持、丧失
2. 整合尺度，整合时空尺度
3. 整合不同层次的多样性—遗传、物种、生态系统
4. 整合学科，动物学、植物学、微生物学的实质性合作
5. 整合理论和实证工作
6. 整合格局和过程，最终将生物多样性科学发展成为基于过程的科学。

Take home message



一桥飞架南北，天堑变通途。

