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BioM2

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APPOINTMENTS

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|--------------|---|
| 2025–Present | Associate Professor , Cornell University
Department of Ecology and Evolutionary Biology |
| 2026 | Visiting Scientist , California Institute of Technology
Division of Geological and Planetary Sciences |
| 2019–2025 | Assistant Professor , Cornell University
Department of Ecology and Evolutionary Biology |
| 2017–2019 | Postdoctoral Researcher , Harvard University
Department of Organismic and Evolutionary Biology; co-appointed at the University of Notre Dame, Department of Biological Sciences |

EDUCATION

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| 2012–2017 | Ph.D. , Princeton University
Department of Geosciences |
| 2008–2012 | B.S. in Geographical Sciences , Peking University
College of Urban and Environmental Sciences; minor in Computer Science |

GRANTS, AWARDS AND HONORS

About \$3.1M to Xu in total. Role and amount are Xu's; the total budget follows the sponsor.

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| 2026–2028 | Digital Twin for Central Africa Biodiversity
NASA | Co-I, \$150k |
| 2026–2027 | Building Resilient Forests: leveraging lidar technology to scaling slash wall treatments to improve forest regeneration with precision forestry technology (Phase 1)
Origin Spring Foundation | PI, \$115k |
| 2025–2027 | CAFRI: Climate & Applied Forestry Institute 3.0&4.0
NYS Department of Environmental Conservation and Department of Agriculture and Markets · total \$1.25M | Co-PI, \$286k |
| 2025–2028 | Quantifying carbon fluxes in New York State wetlands and waterbodies: Mapping ponds, wetlands, and upscaling field flux estimates
NYS Department of Environmental Conservation · total \$584k | Co-I, \$59k |
| 2024–2027 | Tree biomass allometry and forest carbon accounting with terrestrial laser scanning
USDA McIntire-Stennis and Smith-Lever | PI, \$114k |

2024–2026	Lidar-based woody carbon estimation for small-scale farm agroforestry Park Foundation · includes a \$38,677 supplement	PI, \$95k
2024	The Cornell Digital Forestry Initiative (CoDiFI) USDA McIntire-Stennis	PI, \$90k
2023–2028	Expands markets for all forestry and agriculture in New York and supports farmer and forester implementation and monitoring of climate-smart practices USDA NRCS · total \$60M	Co-I, \$693k
2023–2026	Slash wall & LiDAR USDA Hatch	Co-I, \$20k
2022–2024	3D modeling of orchard trees Cornell Institute of Digital Agriculture · total \$150k	PI, \$75k
2022–2023	CAFRI: Climate & Applied Forestry Institute NYS Department of Environmental Conservation and Department of Agriculture and Markets · total \$1M	Co-I, \$80k
2022–2025	MACROCOSM: Monitor And Constrain tROpical eCOsystem Sensitivity to Moisture DOE Office of Science	PI, \$940k
2022–2026	Collaborative: Impacts of severe drought on tropical forest post-disturbance recovery NSF · total \$1.4M	Co-PI, \$235k
2021–2024	Sustainable forest production with terrestrial LiDAR USDA McIntire-Stennis and Smith-Lever	PI, \$176k
2012	Graduate Fellowship Princeton University	
2011	Kenneth Fong Scholarship Peking University	¥5,000
2011	Third Prize, Jiangzehan Cup Mathematical Modeling and Computer Application Competition Peking University · team work	
2009–2011	Geographical Sciences Foundation, 1st prize, three times Peking University	¥2,000/year
2010	National Scholarship and Merit Student Top national scholarship in China	¥8,000
2009	Robin Li Scholarship Peking University	¥5,000

PEER-REVIEWED PUBLICATIONS

Citations 5,417 · h-index 33 · i10-index 44 (Google Scholar, September 2026). **Bold:** lab members; ^P postdoc, ^G graduate student, ^V visiting scholar, ^U undergraduate; * corresponding author from the lab.

In review/revision

Han T^{P*}, **Xu X^{*}**, Niklas K, **Scholl C^G**, **Ma Y^G**, Savage V, Chave J, Wu D, Ni-Meister W (in revision)
Global Convergence in Aboveground Biomass Scaling to Tree Size and Wood Density. *Nature Communications*

Liu D^V, Holgersson M*, **Stewart A^P**, **Xu X^{*}**, Zhu X* (in review) Widespread yet heterogeneous areal dominance of small lakes and ponds. *Proceedings of the National Academy of Sciences*

Uriarte M, Murphy L, **Ma Y^G**, Arellano G, Thompson J, Zimmerman JK, **Xu X** (in revision) Hurricane disturbance regimes and plant functional diversity jointly shape tropical forest carbon balance. *Ecological Monographs*

Uriarte M, Boeschoten L, Brando P, Ibanez T, Smith-Martin C, van der Sande MT, **Xu X** (in review) Disturbance interactions in tropical forests: conceptual underpinnings, emerging tools, and research gaps. *New Phytologist*

Song G, Hughes A, Lian X, Zeng X, Huete A, Albert L, **Xu X**, Peñuelas J, Zohner C, Nelson B, Chen S, Detto M, Guo Z, Malhi Y, Li X, Lin Z, Saleska S, Su Y, Xiao J, Zhao Y, Zhu P, Liu L, Wu J (in revision) Unexpected deciduousness reveals diverse phenological patterns in the Amazon. *Nature*

2026

67. **Liu D^V**, Holgersson M, **Xu X**, Zhu X (accepted) Utility and explainability of Earth embeddings in mapping small ponds. *IEEE Geoscience and Remote Sensing Letters*.
66. **Pacheco FS^P**, Heilpern SA, Almeida RM, Sethi SA, Miranda M, Ray N, Greenstreet L, Fan J, Rappazzo BH, Kabra A, Ummus ME, Alves ÍB, Barros NO, Cavali J, Cesar GM, Doria CR, Fiorella KJ, Forsberg BR, da Silva MG, Maciel DA, McGrath D, McIntyre PB, Moraes-Valenti P, Oliveira I, Ometto JPHB, Roland F, Trindade A, Valenti WC, Valerio AM, **Xu X**, Gomes CP, Flecker AS (2026) Land-use transitions and carbon emissions of aquaculture expansion in the Brazilian Amazon. *Science Advances* 12:eac5472. doi:10.1126/sciadv.aec5472
65. Guan K, Qin R, Ma Z, Zhao L, Liu L, Wang S, Keenan TF, Jia M, Sihi D, Potash E, Asseng S, Tang J, **Xu X**, Boomer K, Peng B, Jin Z, Hoffman FM, Ogle S, Coppess J, Khanna M, Whitcraft A, Runkle BRK (2026) Multi-Model Ensembles in Ecosystem Modeling: Challenges and Best Practices for Decision-Making. *Global Change Biology* 32:e70987. doi:10.1111/gcb.70987
64. Potkay A, Sloan B, Perry A, Sperling O, Hochberg U, **Li R^P**, **Xu X**, Nakad M, Peters RL, Feng X (2026) Disentangling Thermal and Hydraulic Drivers of Stomatal Conductance Under Hot Versus Dry Vapour Pressure Deficit Increases Using Water-Use Efficiency. *Plant, Cell & Environment*. doi:10.1111/pce.70781
63. Boeschoten LE, Smith-Martin CM, Medina-Vega JA, Anderson-Teixeira KJ, Ruiz LAE, Montgomery RA, Picón M, Rao MP, Wood TE, **Xu X**, Zimmerman JK, Uriarte M (2026) Water Limits Radial Tree Growth More Than Light in an Everwet Subtropical Forest. *Global Change Biology* 32:e71021. doi:10.1111/gcb.71021
62. Wong MY, Batterman SA, Lucas JM, Fleischer K, Ashton MS, Bauters M, Burslem DFRP, Cushman K, Dalling JW, Doetterl S, Esquivel-Muelbert A, Fortunel C, Holm JA, Huanca-Nunez N, Liang G, Libalah MB, Lira-Martins D, Medina-Vega JA, Muller-Landau HC, Needham J, Ordway EM, Sánchez-Juliá M, Toro L, **Xu X**, Wright SJ, Zuquim G, Gora EM (2026) Soil fertility controls on tropical forest productivity and mortality: synthesis and roadmap. *New Phytologist* 251:2314–2330. doi:10.1111/nph.71367
61. **Xu X^{*}**, **Scholl C^G**, **Ma Y^G**, Gora E, Uriarte M, Anderegg WRL, Liu Y, **Han T^P**, Luo Y, Koven CD, Hansen WD, Morton DC (2026) Mechanisms and scales in modeling forest responses to changing disturbance regimes. *New Phytologist* 251:1660–1676. doi:10.1111/nph.71384
60. **Scholl CJ^{G*}**, Goodale CL, **Xu X** (2026) Lagged climatic drivers of spongy moth (*Lymantria dispar*) outbreaks revealed by satellite-based defoliation mapping. *Forest Ecology and Management* 615:123854. doi:10.1016/j.foreco.2026.123854
59. **Wu D^{P*}**, Zhou Y, Feng Y, Gora EM, Longo M, Negrón-Juárez RI, Saatchi SS, Liu Y, **Ma Y^G**, Morton DC, McDowell NG, Luo Y, **Xu X^{*}** (2026) Increasing atmospheric dryness and storms accelerates biomass turnover in Amazonian forests. *Nature Climate Change* 16:712–718. doi:10.1038/s41558-026-02639-4
58. Yang X, Tian J, Ciais P, Zhou L, Reich PB, Wu J, Shang J, Chave J, Lamour J, Maréchaux I, Fu YH, Chen JM, Liu J, Tao S, Xiao X, **Xu X**, Su Y, Zhang H, Zhu Z, Zhang Y, Hao D, Chen L, Liu Q, Laforteza R, Yan K, Li P, Li X, Meir P, Liu H, Bonal D, Nelson BW, Tang H, Wang J, Yu K, Yuan W, Wang S, Chen X (2026) Amazon rainforests are rejuvenating their canopies by producing more photosynthetically efficient young leaves under climate change. *Nature Plants* 12:520–531. doi:10.1038/s41477-026-02240-9

57. **Han T^{P*}**, Ferraz A, Fang D, Zheng T, Ankori-Karlinsky R, Arellano G, Morton D, Zimmerman JK, Keller M, Uriarte M, **Xu X** (2026) Taller Trees Experienced Less Crown Damage During a Severe Hurricane in a Tropical Forest. *Global Change Biology* 32:e70709. doi:10.1111/gcb.70709

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56. Cheng C, Zhou G, Tang X, Wang S, Su Y, Wu J, **Xu X**, Xu W, Lin F, Zhou Y, Wang G, Yan J, Ma K, Du S, Li S, Han S, Ma Y, Liu J, Wu D (2025) Spatial patterns and future potential of tree species richness and structural diversity in China's forests. *Nature Ecology & Evolution* 10:70–82. doi:10.1038/s41559-025-02922-1
55. Shen M, Dahlin K, **Xu X**, Butterfield Z (2025) Trait-Based Tree Mortality Risk Assessment From the Perspective of Imaging Spectroscopy. *Global Change Biology* 31:e70337. doi:10.1111/gcb.70337
54. Wang M, Peng S, Lu Z, **Xu X**, Felton A, Chen A (2025) Increasing constraint of aridity on tree intrinsic water use efficiency. *Nature Communications* 16:7560. doi:10.1038/s41467-025-62845-0
53. Sun Y, **Xu X**, **Ma Y^G** (2025) SIF research in the tropics: the overlooked vertical dimension and its implications for interpretation and upscaling of photosynthesis. *New Phytologist* 248:5–7. doi:10.1111/nph.70299
52. Luo Y, Wei N, Lu X, Zhou Y, Tao F, Quan Q, Liao C, Jiang L, Xia J, Huang Y, Niu S, **Xu X**, Sun Y, Zeng N, Koven C, Peng L, Davis S, Smith P, You F, Jiang Y, Cheng L, Houlton B (2025) Large CO₂ removal potential of woody debris preservation in managed forests. *Nature Geoscience* 18:675–681. doi:10.1038/s41561-025-01731-2 · AUTHOR CORRECTION
51. Zhang J, Guan K, Chen Z, Hipple J, Huang Y, Peng B, Wang S, **Xu X**, Jin Z, Zhao K, Jong M (2025) Aligning satellite-based phenology in a deep learning model for improved crop yield estimates over large regions. *Agricultural and Forest Meteorology* 372:110675. doi:10.1016/j.agrformet.2025.110675
50. **Ma Y^{G*}**, Moorcroft PR, Wright SJ, Rogers A, Lamour J, Davidson KJ, Serbin SP, Detto M, **Xu X*** (2025) Constraining Light-Driven Plasticity in Leaf Traits With Observations Improves the Prediction of Tropical Forest Demography, Structure, and Biomass Dynamics. *Journal of Geophysical Research: Biogeosciences* 130:e2025JG008814. doi:10.1029/2025jg008814
49. Yang Y, Guan K, Peng B, Feng X, **Xu X**, Pan M, Sloan BP, Zhang J, Zhou W, Li L, Sivapalan M, Ainsworth EA, Novick KA, Yang ZL, Wang S (2025) A Unified Framework to Reconcile Different Approaches of Modeling Transpiration Response to Water Stress: Plant Hydraulics, Supply Demand Balance, and Empirical Soil Water Stress Function. *Journal of Advances in Modeling Earth Systems* 17:e2023MS003911. doi:10.1029/2023ms003911
48. Longo M, Keller M, Kueppers LM, Bowman KW, Csillik O, Ferraz A, Moorcroft PR, Ometto JP, Soares-Filho BS, **Xu X**, de Assis MLR, Görgens EB, Larson EJJ, Needham JF, Ordway EM, Pereira FRS, Rangel Pinagé E, Sato L, Xu L, Saatchi S (2025) Degradation and deforestation increase the sensitivity of the Amazon Forest to climate extremes. *Environmental Research Letters* 20:054024. doi:10.1088/1748-9326/adc58c
47. **Li X^V**, Guo W, He H, Wang H, Classen A, **Wu D^P**, **Ma Y^G**, Wang Y, He JS, **Xu X*** (2025) Trade-off between spring phenological sensitivities to temperature and precipitation across species and space in alpine grasslands over the Qinghai–Tibetan Plateau. *New Phytologist* 246:554–566. doi:10.1111/nph.70008
46. Wang J, Pottier C, Cazals C, Battude M, Sheng Y, Song C, Sikder MS, Yang X, Ke L, Delhoume M, Gosset M, Oliveira RRA, Grippa M, Girard F, Allen GH, **Xu X**, Zhu X, Biancamaria S, Smith LC, Crétaux JF, Pavelsky TM (2025) The Surface Water and Ocean Topography Mission (SWOT) Prior Lake Database (PLD): Lake Mask and Operational Auxiliaries. *Water Resources Research* 61:e2023WR036896. doi:10.1029/2023wr036896
45. **Pacheco FS^{P*}**, Heilpern SA, DiLeo C, Almeida RM, Sethi SA, Miranda M, Ray N, Barros NO, Cavali J, Costa C, Doria CR, Fan J, Fiorella KJ, Forsberg BR, Gomes M, Greenstreet L, Holgersson M, McGrath D, McIntyre PB, Moraes-Valenti P, Oliveira I, Ometto JPHB, Roland F, Trindade A, Ummus ME, Valenti WC, **Xu X**, Gomes CP, Flecker AS (2025) Towards sustainable aquaculture in the Amazon. *Nature Sustainability* 8:234–244. doi:10.1038/s41893-024-01500-w

2024

44. **Liu D^V**, **Zhu X^V**, Holgerson M, Bansal S, **Xu X^{*}** (2024) Inventorying ponds through novel size-adaptive object mapping using Sentinel-1/2 time series. *Remote Sensing of Environment* 315:114484. doi:10.1016/j.rse.2024.114484
43. **Cranmer N^{G*}**, **Han T^P**, Chedzoy B, Smallidge PJ, Beier C, Johnson L, **Xu X** (2024) Estimating merchantable and non-merchantable wood volume in slash walls using terrestrial and airborne LiDAR. *Forest Ecology and Management* 569:122211. doi:10.1016/j.foreco.2024.122211
42. Short Gianotti DJ, McColl KA, Feldman AF, **Xu X**, Entekhabi D (2024) Two sub-annual timescales and coupling modes for terrestrial water and carbon cycles. *Global Change Biology* 30:e17463. doi:10.1111/gcb.17463
41. Qiu T, Wang T, **Han T^P**, Kuehn K, Cheng L, Meng C, **Xu X**, Xu K, Yu J (2024) AppleQSM: Geometry-Based 3D Characterization of Apple Tree Architecture in Orchards. *Plant Phenomics* 6:0179. doi:10.34133/plantphenomics.0179
40. Yan Z, Detto M, Guo Z, Smith NG, Wang H, Albert LP, **Xu X**, Lin Z, Liu S, Zhao Y, Chen S, Bonebrake TC, Wu J (2024) Global photosynthetic capacity jointly determined by enzyme kinetics and eco-evo-environmental drivers. *Fundamental Research* 5:2062–2072. doi:10.1016/j.fmre.2023.12.011
39. **Xu X^{*}**, van der Sleen P, Groenendijk P, Vlam M, Medvigy D, Moorcroft P, **Petticord D^G**, **Ma Y^G**, Zuidema PA (2024) Constraining long-term model predictions for woody growth using tropical tree rings. *Global Change Biology* 30:e17075. doi:10.1111/gcb.17075

2023

38. **Wu D^{P*}**, Grodsky SM, Xu W, Liu N, Almeida RM, Zhou L, Miller LM, Roy SB, Xia G, Agrawal AA, Houlton BZ, Flecker AS, **Xu X^{*}** (2023) Observed impacts of large wind farms on grassland carbon cycling. *Science Bulletin* 68:2889–2892. doi:10.1016/j.scib.2023.10.016
37. Yang X, Li R, Jablonski A, Stovall A, Kim J, Yi K, **Ma Y^G**, Beverly D, Phillips R, Novick K, **Xu X**, Lerdau M (2023) Leaf angle as a leaf and canopy trait: Rejuvenating its role in ecology with new technology. *Ecology Letters* 26:1005–1020. doi:10.1111/ele.14215
36. Greenstreet L, Fan J, **Pacheco FS^P**, Bai Y, Ummus ME, Doria C, Barros NO, Forsberg BR, **Xu X**, Flecker A, Gomes C (2023) Detecting aquaculture with deep learning in a low-data setting. *SIGKDD Fragile Earth Workshop*.
35. Wang H, Prentice IC, Wright IJ, Warton DI, Qiao S, **Xu X**, Zhou J, Kikuzawa K, Stenseth NC (2023) Leaf economics fundamentals explained by optimality principles. *Science Advances* 9:eadd5667. doi:10.1126/sciadv.add5667
34. Holm JA, Medvigy DM, Smith B, Dukes JS, Beier C, Mishurov M, **Xu X**, Lichstein JW, Allen CD, Larsen KS, Luo Y, Ficken C, Pockman WT, Anderegg WRL, Rammig A (2023) Exploring the impacts of unprecedented climate extremes on forest ecosystems: hypotheses to guide modeling and experimental studies. *Biogeosciences* 20:2117–2142. doi:10.5194/bg-20-2117-2023

2022

33. **Wu D^{P*}**, Vargas G G, Powers JS, McDowell NG, Becknell JM, Pérez-Aviles D, Medvigy D, Liu Y, Katul GG, Calvo-Alvarado JC, Calvo-Obando A, Sanchez-Azofeifa A, **Xu X^{*}** (2022) Reduced ecosystem resilience quantifies fine-scale heterogeneity in tropical forest mortality responses to drought. *Global Change Biology* 28:2081–2094. doi:10.1111/gcb.16046

2021

32. **Xu X^{*}**, Trugman AT (2021) Trait-Based Modeling of Terrestrial Ecosystems: Advances and Challenges Under Global Change. *Current Climate Change Reports* 7:1–13. doi:10.1007/s40641-020-00168-6 · INVITED REVIEW
31. Meunier F, Verbeeck H, Cowdery B, Schnitzer SA, Smith-Martin CM, Powers JS, **Xu X**, Slot M, De Deurwaerder HPT, Detto M, Bonal D, Longo M, Santiago LS, Dietze M (2021) Unraveling the relative role of light and water competition between lianas and trees in tropical forests: A vegetation model analysis. *Journal of Ecology* 109:519–540. doi:10.1111/1365-2745.13540

30. **Wu D^P**, **Xu X**, Zhang H (2021) Plant input does not exert stronger control on topsoil carbon persistence than climate in alpine grasslands. *Ecology Letters* 24:2526–2528. doi:10.1111/ele.13879
29. Yang X, **Xu X**, Stovall A, Chen M, Lee JE (2021) Recovery: Fast and Slow—Vegetation Response During the 2012–2016 California Drought. *Journal of Geophysical Research: Biogeosciences* 126:e2020JG005976. doi:10.1029/2020jg005976
28. **Xu X^{*}**, Konings AG, Longo M, Feldman A, Xu L, Saatchi S, Wu D, Wu J, Moorcroft P (2021) Leaf surface water, not plant water stress, drives diurnal variation in tropical forest canopy water content. *New Phytologist* 231:122–136. doi:10.1111/nph.17254 · COMMENTARY BY GERLEIN-SAFDI
27. Wu S, Wang J, Yan Z, Song G, Chen Y, Ma Q, Deng M, Wu Y, Zhao Y, Guo Z, Yuan Z, Dai G, **Xu X**, Yang X, Su Y, Liu L, Wu J (2021) Monitoring tree-crown scale autumn leaf phenology in a temperate forest with an integration of PlanetScope and drone remote sensing observations. *ISPRS Journal of Photogrammetry and Remote Sensing* 171:36–48. doi:10.1016/j.isprsjprs.2020.10.017
26. Konings AG, Saatchi SS, Frankenberg C, Keller M, Leshyk V, Anderegg WRL, Humphrey V, Matheny AM, Trugman A, Sack L, Agee E, Barnes ML, Binks O, Cawse-Nicholson K, Christoffersen BO, Entekhabi D, Gentile P, Holtzman NM, Katul GG, Liu Y, Longo M, Martinez-Vilalta J, McDowell N, Meir P, Mencuccini M, Mrad A, Novick KA, Oliveira RS, Siqueira P, Steele-Dunne SC, Thompson DR, Wang Y, Wehr R, Wood JD, **Xu X**, Zuidema PA (2021) Detecting forest response to droughts with global observations of vegetation water content. *Global Change Biology* 27:6005–6024. doi:10.1111/gcb.15872

2020

25. **Wu D^P**, Piao S, Zhu D, Wang X, Ciais P, Bastos A, **Xu X**, Xu W (2020) Accelerated terrestrial ecosystem carbon turnover and its drivers. *Global Change Biology* 26:5052–5062. doi:10.1111/gcb.15224
24. Smith-Martin CM, **Xu X**, Medvigy D, Schnitzer SA, Powers JS (2020) Allometric scaling laws linking biomass and rooting depth vary across ontogeny and functional groups in tropical dry forest lianas and trees. *New Phytologist* 226:714–726. doi:10.1111/nph.16275 · COMMENTARY BY LUGLI
23. Detto M, **Xu X** (2020) Optimal leaf life strategies determine $V_{c,max}$ dynamic during ontogeny. *New Phytologist* 228:361–375. doi:10.1111/nph.16712
22. Powers JS, Vargas G G, Brodribb TJ, Schwartz NB, Pérez-Aviles D, Smith-Martin CM, Becknell JM, Aureli F, Blanco R, Calderón-Morales E, Calvo-Alvarado JC, Calvo-Obando AJ, Chavarria MM, Carvajal-Vanegas D, Jiménez-Rodríguez CD, Murillo Chacon E, Schaffner CM, Werden LK, **Xu X**, Medvigy D (2020) A catastrophic tropical drought kills hydraulically vulnerable tree species. *Global Change Biology* 26:3122–3133. doi:10.1111/gcb.15037

2019

21. Levy-Varon JH, Batterman SA, Medvigy D, **Xu X**, Hall JS, van Breugel M, Hedin LO (2019) Tropical carbon sink accelerated by symbiotic dinitrogen fixation. *Nature Communications* 10:5637. doi:10.1038/s41467-019-13656-7
20. Medvigy D, Wang G, Zhu Q, Riley WJ, Trierweiler AM, Waring BG, **Xu X**, Powers JS (2019) Observed variation in soil properties can drive large variation in modelled forest functioning and composition during tropical forest secondary succession. *New Phytologist* 223:1820–1833. doi:10.1111/nph.15848

2018

19. Guan K, Good SP, Caylor KK, Medvigy D, Pan M, Wood EF, Sato H, Biasutti M, Chen M, Ahlström A, **Xu X** (2018) Simulated sensitivity of African terrestrial ecosystem photosynthesis to rainfall frequency, intensity, and rainy season length. *Environmental Research Letters* 13:025013. doi:10.1088/1748-9326/aa9f30
18. Wang X, Wu J, Chen M, **Xu X**, Wang Z, Wang B, Wang C, Piao S, Lin W, Miao G, Deng M, Qiao C, Wang J, Xu S, Liu L (2018) Field evidences for the positive effects of aerosols on tree growth. *Global Change Biology* 24:4983–4992. doi:10.1111/gcb.14339

17. McDowell N, Allen CD, Anderson-Teixeira K, Brando P, Brien R, Chambers J, Christoffersen B, Davies S, Doughty C, Duque A, Espirito-Santo F, Fisher R, Fontes CG, Galbraith D, Goodsman D, Grossiord C, Hartmann H, Holm J, Johnson DJ, Kassim AR, Keller M, Koven C, Kueppers L, Kumagai T, Malhi Y, McMahon SM, Mencuccini M, Meir P, Moorcroft P, Muller-Landau HC, Phillips OL, Powell T, Sierra CA, Sperry J, Warren J, Xu C, **Xu X** (2018) Drivers and mechanisms of tree mortality in moist tropical forests. *New Phytologist* 219:851–869. doi:10.1111/nph.15027
16. **Xu X***, Medvigy D, Trugman AT, Guan K, Good SP, Rodriguez-Iturbe I (2018) Tree cover shows strong sensitivity to precipitation variability across the global tropics. *Global Ecology and Biogeography* 27:450–460. doi:10.1111/geb.12707
15. Fisher RA, Koven CD, Anderegg WRL, Christoffersen BO, Dietze MC, Farrior CE, Holm JA, Hurtt GC, Knox RG, Lawrence PJ, Lichstein JW, Longo M, Matheny AM, Medvigy D, Muller-Landau HC, Powell TL, Serbin SP, Sato H, Shuman JK, Smith B, Trugman AT, Viskari T, Verbeeck H, Weng E, Xu C, **Xu X**, Zhang T, Moorcroft PR (2018) Vegetation demographics in Earth System Models: A review of progress and priorities. *Global Change Biology* 24:35–54. doi:10.1111/gcb.13910

2017

14. Allen K, Dupuy JM, Gei MG, Hulshof C, Medvigy D, Pizano C, Salgado-Negret B, Smith CM, Trierweiler A, Van Bloem SJ, Waring BG, **Xu X**, Powers JS (2017) Will seasonally dry tropical forests be sensitive or resistant to future changes in rainfall regimes?. *Environmental Research Letters* 12:023001. doi:10.1088/1748-9326/aa5968
13. **Xu X***, Medvigy D, Joseph Wright S, Kitajima K, Wu J, Albert LP, Martins GA, Saleska SR, Pacala SW (2017) Variations of leaf longevity in tropical moist forests predicted by a trait-driven carbon optimality model. *Ecology Letters* 20:1097–1106. doi:10.1111/ele.12804
12. Wu J, Guan K, Hayek M, Restrepo-Coupe N, Wiedemann KT, **Xu X**, Wehr R, Christoffersen BO, Miao G, da Silva R, de Araujo AC, Oliveira RC, Camargo PB, Monson RK, Huete AR, Saleska SR (2017) Partitioning controls on Amazon forest photosynthesis between environmental and biotic factors at hourly to interannual timescales. *Global Change Biology* 23:1240–1257. doi:10.1111/gcb.13509
11. Wu J, Serbin SP, **Xu X**, Albert LP, Chen M, Meng R, Saleska SR, Rogers A (2017) The phenology of leaf quality and its within-canopy variation is essential for accurate modeling of photosynthesis in tropical evergreen forests. *Global Change Biology* 23:4814–4827. doi:10.1111/gcb.13725
10. Li Y, Guan K, Gentine P, Konings AG, Meinzer FC, Kimball JS, **Xu X**, Anderegg WRL, McDowell NG, Martinez-Vilalta J, Long DG, Good SP (2017) Estimating Global Ecosystem Isohydry/Anisohydry Using Active and Passive Microwave Satellite Data. *Journal of Geophysical Research: Biogeosciences* 122:3306–3321. doi:10.1002/2017jg003958

2016

9. Oh Y, Stackhouse B, Lau MCY, **Xu X**, Trugman AT, Moch J, Onstott TC, Jørgensen CJ, D’Imperio L, Elberling B, Emmerton CA, St. Louis VL, Medvigy D (2016) A scalable model for methane consumption in arctic mineral soils. *Geophysical Research Letters* 43:5143–5150. doi:10.1002/2016gl069049
8. **Xu X***, Medvigy D, Powers JS, Becknell JM, Guan K (2016) Diversity in plant hydraulic traits explains seasonal and inter-annual variations of vegetation dynamics in seasonally dry tropical forests. *New Phytologist* 212:80–95. doi:10.1111/nph.14009 · COMMENTARY BY [MEDLYN ET AL.](#)
7. Trugman AT, Fenton NJ, Bergeron Y, **Xu X**, Welp LR, Medvigy D (2016) Climate, soil organic layer, and nitrogen jointly drive forest development after fire in the North American boreal zone. *Journal of Advances in Modeling Earth Systems* 8:1180–1209. doi:10.1002/2015ms000576

Before 2016

6. Wang X, Piao S, **Xu X**, Ciais P, MacBean N, Myneni RB, Li L (2015) Has the advancing onset of spring vegetation green-up slowed down or changed abruptly over the last three decades?. *Global Ecology and Biogeography* 24:621–631. doi:10.1111/geb.12289

5. **Xu X***, Medvigy D, Rodriguez-Iturbe I (2015) Relation between rainfall intensity and savanna tree abundance explained by water use strategies. *Proceedings of the National Academy of Sciences* 112:12992–12996. doi:10.1073/pnas.1517382112
4. Guan K, Wood EF, Medvigy D, Kimball J, Pan M, Caylor KK, Sheffield J, **Xu X**, Jones MO (2014) Terrestrial hydrological controls on land surface phenology of African savannas and woodlands. *Journal of Geophysical Research: Biogeosciences* 119:1652–1669. doi:10.1002/2013jg002572
3. Yang Y, Zhao M, **Xu X**, Sun Z, Yin G, Piao S (2014) Diurnal and Seasonal Change in Stem Respiration of *Larix principis-rupprechtii* Trees, Northern China. *PLoS ONE* 9:e89294. doi:10.1371/journal.pone.0089294
2. Mohammad A, Wang X, **Xu X**, Peng L, Yang Y, Zhang X, Myneni RB, Piao S (2013) Drought and spring cooling induced recent decrease in vegetation growth in Inner Asia. *Agricultural and Forest Meteorology* 178-179:21–30. doi:10.1016/j.agrformet.2012.09.014
1. **Xu X**, Piao S, Wang X, Chen A, Ciais P, Myneni RB (2012) Spatio-temporal patterns of the area experiencing negative vegetation growth anomalies in China over the last three decades. *Environmental Research Letters* 7:035701. doi:10.1088/1748-9326/7/3/035701

PATENTS

- 2022 Guan K, Peng J, **Xu X**, Wang S, Peng B. Apparatus and method for crop yield prediction. US Patent Application US 2022/0067614 A1
 Appl. No. 17/415,598, pending · assignee: The Board of Trustees of the University of Illinois

INVITED PRESENTATIONS

2026

Integrating Multi-Scale Data to Constrain Forest Biomass Stocks and Dynamics
 California Institute of Technology, Environmental Science and Engineering Seminar

Plant functional diversity, plasticity, and convergence in forest ecosystem modeling
 University of California, Los Angeles, Department of Ecology and Evolutionary Biology

The ecological and biogeochemical importance of storms in tropical forests
 University of California, Santa Barbara, Department of Geography

2025

Quantifying Storm Impacts on Tropical Forests from Crowns to Landscapes
 University of Puerto Rico, Rio Piedras, PR

2024

Predicting tropical forest growth and mortality under climate change
 Columbia University Department of Ecology, Evolution and Environmental Biology Department, NY

Predicting forest resilience under climate change
 Cornell University Department of Ecology and Evolutionary Biology, NY

Predicting tropical forest growth and mortality under global change: insights from tree rings and satellite remote sensing
 Cary Institute of Ecosystem Studies, Milbrook, NY

Trait-based modeling of tropical forest structure and dynamics: critical dimensions of plant functional diversity · KEYNOTE
 2nd East-Regional Dynamic Global Vegetation Model Conference, Marine Biology Lab, Woods Hole, MA

2023

Tropical forest growth and mortality under global change
Tsinghua University, Department of Geosciences

Critical dimensions of plant functional diversity for predicting tropical forest structure and dynamics
Yale University, Department of Ecology and Evolutionary Biology

Monitoring and modeling tropical forest resilience to environmental change
NASA Goddard Space Flight Center, Biospheric Science Seminar

Monitoring and modeling tropical forest resilience to environmental change
University of California Santa Barbara, Climate Change Seminar

Monitoring forest growth and mortality under a changing climate: opportunities from big data across ecological scales
Cornell University, Scientific Computing And Numeric seminar series

2022

Critical dimensions of plant functional diversity that shape tropical forest structure and dynamics
University of Maine, School of Biology and Ecology

Integrate model and observations across scales to understand plant water stress in tropical forests
Sino-Eco online seminars

How light-driven trait plasticity drives tropical forest dynamics
Department of Energy NGEE-Tropics

Does reduced resilience in remote sensing timeseries “predict” tropical forest mortality?
Forest Resilience & Rate-induced Transition Workshop, Radcliff Institute, Harvard University

2021

Quantifying drought-driven forest mortality from reduced ecosystem resilience in tropical forests
Department of Energy NGEE-Tropics

2020

Terrestrial Biosphere Modeling: Advances and Challenges under Global Change
Invited seminar at College of Urban and Environmental Sciences, Peking University

Unraveling tropical leaf phenological diversity with observations and models across scales
University of British Columbia, Biodiversity Research Centre

TEACHING

2026	BIOEE 7660 Agentic AI in Ecology and Evolutionary Biology Co-lead, 2026 · 1 credit, graduate seminar · 30 enrollment
2020–2026	BIOEE 1610 Introductory Biology: Ecology and Environment Lead instructor fall 2022 and fall 2026; section lead fall 2020, 2021 and 2024 · 3 credit, optional 1 credit Writing in the Majors program · 180–250 enrollment
2025	BIOEE 7600 Special Topics in Ecology and Evolutionary Biology: Vegetation and Terrestrial Biosphere Modeling Lead instructor, fall 2025 · 1 credit · 4 enrollment
2021–2025	BIOEE 3550/6550 Ecological and environmental data analytics Sole instructor, every spring 2021–2025 · 2 credits lecture + 1 credit lab · 20–30 enrollment
2024	BIOEE 7660 Frontiers in Ecology and Evolutionary Biology Sole instructor, fall 2024 · 1 credit, graduate paper reading seminar · ~10 enrollment
2022, 2024	PLSCS 4290/5290 Remote Sensing Applications for Ecosystems One guest lecture, fall 2022 and fall 2024 · 3 credit · 10–20 enrollment

MENTORING

Ph.D. students

2025–Present	Cameron Reimer, Ecology and Evolutionary Biology
2023–Present	Nicholas Cranmer, Ecology and Evolutionary Biology
2023–Present	Coral del Mar Valle-Rodriguez, Ecology and Evolutionary Biology recipient of SUNY Diversity fellowship
2022–Present	Cameron Scholl, Ecology and Evolutionary Biology recipient of DOE CSGF award
2021–2026	Yixin Ma, Ecology and Evolutionary Biology · FIRST PH.D. STUDENT; START DELAYED ONE YEAR BY COVID

Ph.D. committee members

2025–Present	Weina Duan (Yang Lab), Soil and Crop Science
2025–Present	Woojin Huh (Bauerle Lab), Horticulture
2025–Present	Abigail Grassick (Hein Lab), Computational Biology
2024–Present	Julie Peeling (Allington Lab), Natural Resource and Environment
2024–Present	Hannah Zonneville (Katz Lab), Soil and Crop Science
2023–Present	Crystal Fowler (Jung Lab), Biological & Environmental Engineering
2022–Present	Seunjoon Lee (Sun Lab), Soil and Crop Science
2022–2026	Stephanie Freund (Goodale Lab), Ecology and Evolutionary Biology
2021–2026	Yan-Ning Kuo (Lehner Lab), Earth and Atmospheric Sciences
2022–2025	Aneesh Kumar Chandel (Luo Lab), Soil and Crop Science
2021–2025	Daniel Petticord (Sparks Lab), Ecology and Evolutionary Biology
2021–2025	Jiameng Lai (Sun Lab), Soil and Crop Science
2021–2024	Yi Yang (Guan Lab), UIUC Natural Resources & Environmental Sciences
2021–2023	Yanqiu Zhou (Houlton Lab), Ecology and Evolutionary Biology

Postdocs

2025–Present	Rong Li, Ecology and Evolutionary Biology Recipient of Cornell Schmidt AI4Science Fellowship
2024–Present	Anthony Stewart, Ecology and Evolutionary Biology Co-advised with Meredith Holgerson Recipient of Atkinson Postdoctoral Fellowship in Sustainability
2023–Present	Tao Han, Ecology and Evolutionary Biology
2022–Present	Felipe Pacheco, Ecology and Evolutionary Biology Co-advised with Alex Flecker Recipient of Cornell Schmidt AI4Science Fellowship
2019–2023	Donghai Wu, Ecology and Evolutionary Biology Currently staff scientist at South China Botanic Garden

Undergraduate research

2026–Present	Finn Ericson honor thesis mentor
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2026–Present	Mateo Aparicio honor thesis mentor
2025–Present	Orion Hoch
2025–2026	Rachael Kim, Biometry & Statistics
2023–2025	Sabrina Chow, Computational Biology honor thesis mentor
2023–2025	Dylan van Bramer, Computing and Information Science
2023–2024	Kate Doherty, Environment & Sustainability
2022–2024	Ilana Greenspan, Environment & Sustainability honor thesis mentor
2022–2023	Summer Harper, Environment & Sustainability
2021–2023	Qifan Wang, Ecology and Evolutionary Biology honor thesis mentor
2021–2022	Andrew Wang, Computational Biology
2020–2022	Maddie Watson, Environment & Sustainability

OUTREACH

Jul 2026	<i>Satellite imagery could protect trees from devastating moth outbreaks</i> , Cornell Chronicle (coverage of Scholl et al. 2026)
Jun 2026	<i>How to Weigh a Forest: Precision Forestry with LiDAR Technology</i> , ForestConnect webinar series
2025	<i>Drones and lasers in the woods: opportunities and challenges in precision forestry</i> , public presentation at Cornell Cooperative Extension Schuyler County Annual Meeting
Apr 2024	<i>Satellite signals can measure a forest's moisture—and its ability to survive</i> , Science News (interviewed to provide expert opinions)
Dec 2024	<i>Die kranke Lunge der Erde</i> , DeutschlandRadio (radio interview on AGU presentation about Amazon forest mortality)
Feb 2023	<i>Life Mystery Solved: What Determines the Lifespan of a Tree Leaf?</i> , SciTechDaily
Dec 2022	<i>Using Terrestrial Lidar for Accurate Forest Carbon Inventories</i> , Northern Woodlands (featuring lab-led forestry lidar workshop)
Sep 2022	<i>\$60M USDA grant supports NYS climate-smart farms and forests</i> , Cornell Chronicle
Feb 2020	<i>Nitrogen-fixing trees help tropical forests grow faster and store more carbon</i> , EurekAlert!
Oct 2015	<i>More rain leads to fewer trees in the African savanna</i> , Princeton University News

SERVICE AND SYNERGISTIC ACTIVITIES

Professional and community service

2025–Present	Advisory Board of <i>New Phytologist</i>
2024–Present	Advisory Board of <i>Global Change Biology</i>
2024–2026	Lead organizer of the 3 rd (2024–2025) and co-organizer of the 4 th (2026) Dynamic Vegetation Modeling and Observation Conference (DVMOC, formerly Eastern Regional Dynamic Vegetation Modeling Conference)
2024	Aspen Global Change Institute Workshop: Future Terrestrial Water Availability: Towards an Integrated Perspective on Water, Plants, and Climate (Co-Lead)

2021–2026	Annual CoDiFI (Cornell Digital Forestry Initiative) summer workshop
2021–2024	Organizer for the ED2 terrestrial biosphere model user and developer annual meetings
2026	NSF GRFP panel reviewer
2025	NASA MAP program panel reviewer
2023	NSF DEB program panel reviewer
2021	NASA SMAP program panel reviewer
2018–Present	Conveners for AGU Fall Meetings (lead or co-lead every year)
2014–Present	Ad hoc reviewers for 150+ manuscripts including <i>Nature</i> , <i>Science</i> , <i>PNAS</i> , <i>New Phytologist</i> , <i>Global Change Biology</i> , <i>Ecology Letters</i> , etc.