

## Supplemental Document: Publications used to generate Figure 1.

1. Ballester, M. A remote sensing/GIS-based physical template to understand the biogeochemistry of the Ji-Paraná river basin (Western Amazônia). *Remote Sensing of Environment* 2003, 87, 429–445.
2. Barroso, D.F.R.; Figueiredo, R.O.; Pires, C.S.; Costa, F.F. Avaliação da sustentabilidade ambiental de sistemas agropecuários em microbacias do Nordeste Paraense a partir de parâmetros físico-químicos. *IHGP* 2015, 2, 56–68.
3. Bäse, F.; Elsenbeer, H.; Neill, C.; Krusche, A.V. Differences in throughfall and net precipitation between soybean and transitional tropical forest in the southern Amazon, Brazil. *Agriculture, Ecosystems & Environment* 2012, 159, 19–28.
4. Bernardes, M.C.; Martinelli, L.A.; Krusche, A.V.; Gudeman, J.; Moreira, M.; Victoria, R.L.; Ometto, J.P.H.B.; Ballester, M.V.R.; Aufdenkampe, A.K.; Richey, J.E.; et al. Riverine organic matter composition as a function of land use changes, Southwest Amazon. *Ecological Applications* 2004, 14, 263–279.
5. Biggs, T.W.; Dunne, T.; Martinelli, L.A. Natural controls and human impacts on stream nutrient concentrations in a deforested region of the Brazilian Amazon basin. *Biogeochemistry* 2004, 68, 227–257.
6. Biggs, T.W.; Dunne, T.; Domingues, T.F.; Martinelli, L.A. Relative influence of natural watershed properties and human disturbance on stream solute concentrations in the southwestern Brazilian Amazon basin. *Water Resources Research* 2002, 38, 25-1-25–16.
7. Biggs, T.W.; Dunne, T.; Muraoka, T. Transport of water, solutes and nutrients from a pasture hillslope, southwestern Brazilian Amazon. *Hydrological Processes* 2006, 20, 2527–2547.

8. Bisinoti, M.C.; Sargentini Júnior, É.; Jardim, W.F. Seasonal behavior of mercury species in waters and sediments from the Negro River Basin, Amazon, Brazil. *J. Braz. Chem. Soc.* 2007, 18, 544–553.
9. Bleich, M.E.; Mortati, A.F.; André, T.; Piedade, M.T.F. Riparian deforestation affects the structural dynamics of headwater streams in Southern Brazilian Amazonia. *Tropical Conservation Science* 2014, 7, 657–676.
10. Bleich, M.E.; Piedade, M.T.F.; Mortati, A.F.; André, T. Autochthonous primary production in southern Amazon headwater streams: Novel indicators of altered environmental integrity. *Ecological Indicators* 2015, 53, 154–161.
11. Börner, J.; Mendoza, A.; Vosti, S.A. Ecosystem services, agriculture, and rural poverty in the Eastern Brazilian Amazon: Interrelationships and policy prescriptions. *Ecological Economics* 2007, 64, 356–373.
12. Bouchez, J.; Galy, V.; Hilton, R.G.; Gaillardet, J.; Moreira-Turcq, P.; Pérez, M.A.; France-Lanord, C.; Maurice, L. Source, transport and fluxes of Amazon River particulate organic carbon: Insights from river sediment depth-profiles. *Geochimica et Cosmochimica Acta* 2014, 133, 280–298.
13. Bourgoïn, L.M.; Bonnet, M.-P.; Martinez, J.-M.; Kosuth, P.; Cochonneau, G.; Moreira-Turcq, P.; Guyot, J.-L.; Vauchel, P.; Filizola, N.; Seyler, P. Temporal dynamics of water and sediment exchanges between the Curuaí floodplain and the Amazon River, Brazil. *Journal of Hydrology* 2007, 335, 140–156.
14. Brandes, J.A.Y.A.; McClain, M.E.; Pimentel, T.P. <sup>15</sup>N evidence for the origin and cycling of inorganic nitrogen in a small Amazonian catchment. *Biogeochemistry* 1996, 34, 45–56.

15. Bustillo, V.; Victoria, R.L.; Moura, J.M.S. de; Victoria, D. de C.; Toledo, A.M.A.; Collicchio, E. Factors driving the biogeochemical budget of the Amazon River and its statistical modelling. *Comptes Rendus Geoscience* 2011, 343, 261–277.
16. Cak, A.D.; Moran, E.F.; Figueiredo, R. de O.; Lu, D.; Li, G.; Hetrick, S. Urbanization and small household agricultural land use choices in the Brazilian Amazon and the role for the water chemistry of small streams. *Journal of Land Use Science* 2016, 11, 203–221.
17. Chaves, J.; Neill, C.; Germer, S.; Neto, S.G.; Krusche, A.; Elsenbeer, H. Land management impacts on runoff sources in small Amazon watersheds. *Hydrological Processes* 2008, 22, 1766–1775.
18. Chaves, J.; Neill, C.; Germer, S.; Gouveia Neto, S.; Krusche, A.V.; Castellanos Bonilla, A.; Elsenbeer, H. Nitrogen Transformations in Flowpaths Leading from Soils to Streams in Amazon Forest and Pasture. *Ecosystems* 2009, 12, 961–972.
19. Coe, M.T.; Latrubesse, E.M.; Ferreira, M.E.; Amsler, M.L. The effects of deforestation and climate variability on the streamflow of the Araguaia River, Brazil. *Biogeochemistry* 2011, 105, 119–131.
20. Correa, J.M.; Gerhard, P.; Figueiredo, R. de O. Ictiofauna de igarapes de pequenas bacias de drenagem em área agrícola do Nordeste Paraense, Amazonia Oriental. *Ambi-Agua* 2012, 7, 214–230.
21. Cossio-Solano, R.E. Land use of riparian zones in two communities in the Palcazu Basin, Central Andean Amazon, Peru, Florida International University: Miami, FL, 2001.
22. Couceiro, S.R.M.; Hamada, N.; Forsberg, B.R.; Padovesi-Fonseca, C. Effects of anthropogenic silt on aquatic macroinvertebrates and abiotic variables in streams in the Brazilian Amazon. *Journal of Soils and Sediments* 2010, 10, 89–103.

23. Cravo, M. da S.; Smyth, T.J.; Brasil, E.C. Calagem em latossolo amarelo distrófico da amazônia e sua influência em atributos químicos do solo e na produtividade de culturas anuais. *Rev. Bras. Ciênc. Solo* 2012, 36, 895–908.
24. d'Oliveira, M.V.N.; Alvarado, E.C.; Santos, J.C.; Carvalho, J.A. Forest natural regeneration and biomass production after slash and burn in a seasonally dry forest in the Southern Brazilian Amazon. *Forest Ecology and Management* 2011, 261, 1490–1498.
25. Davidson, E.A.; Figueiredo, R.O.; Markewitz, D.; Aufdenkampe, A.K. Dissolved CO<sub>2</sub> in small catchment streams of eastern Amazonia: A minor pathway of terrestrial carbon loss. *J. Geophys. Res.* 2010, 115, G04005.
26. Davidson, E.A.; Neill, C.; Krusche, A.V.; Ballester, M.V.R.; Markewitz, D.; Figueiredo, R. d. O. Loss of nutrients from terrestrial ecosystems to streams and the atmosphere following land use change in Amazonia. *Ecosystems and Land Use Change Geophysical Monograph Series* 2004, 153, 147–158.
27. de Fátima F. L. Rasera, M.; Ballester, M.V.R.; Krusche, A.V.; Salimon, C.; Montebelo, L.A.; Alin, S.R.; Victoria, R.L.; Richey, J.E. Estimating the Surface Area of Small Rivers in the Southwestern Amazon and Their Role in CO<sub>2</sub> Outgassing. *Earth Interact.* 2008, 12, 1–16.
28. de Fátima F. L. Rasera, M.; Krusche, A.V.; Richey, J.E.; Ballester, M.V.R.; Victória, R.L. Spatial and temporal variability of pCO<sub>2</sub> and CO<sub>2</sub> efflux in seven Amazonian Rivers. *Biogeochemistry* 2013, 116, 241–259.
29. de Melo, M.L.; Bertilsson, S.; Amaral, J.H.F.; Barbosa, P.M.; Forsberg, B.R.; Sarmiento, H. Flood pulse regulation of bacterioplankton community composition in an Amazonian floodplain lake. *Freshw Biol* 2019, 64, 108–120.

30. de Moraes, J.M.; Schuler, A.E.; Dunne, T.; Figueiredo, R. de O.; Victoria, R.L. Water storage and runoff processes in plinthic soils under forest and pasture in eastern Amazonia. *Hydrological Processes* 2006, 20, 2509–2526.
31. de Paula, J.D.; Luizão, F.J.; Piedade, M.T.F. The size distribution of organic carbon in headwater streams in the Amazon basin. *Environ Sci Pollut Res* 2016, 23, 11461–11470.
32. Deegan, L.A.; Neill, C.; Hauptert, C.L.; Ballester, M.V.R.; Krusche, A.V.; Victoria, R.L.; Thomas, S.M.; de Moor, E. Amazon deforestation alters small stream structure, nitrogen biogeochemistry and connectivity to larger rivers. *Biogeochemistry* 2010.
33. Devol, A.H.; Forsberg, B.R.; Richey, J.E.; Pimentel, T.P. Seasonal variation in chemical distributions in the Amazon (Solimões) River: A multiyear time series. *Global Biogeochemical Cycle* 1995, 9, 307–328.
34. Dias, L.C.P.; Macedo, M.N.; Costa, M.H.; Coe, M.T.; Neill, C. Effects of land cover change on evapotranspiration and streamflow of small catchments in the Upper Xingu River Basin, Central Brazil. *Journal of Hydrology: Regional Studies* 2015, 4, 108–122.
35. dos Santos Sousa, E.; Salimon, C.I.; de Oliveira Figueiredo, R.; Krusche, A.V. Dissolved carbon in an urban area of a river in the Brazilian Amazon. *Biogeochemistry* 2011, 105, 159–170.
36. Ellis, E.E.; Richey, J.E.; Aufdenkampe, A.K.; Krusche, A.V.; Quay, P.D.; Salimon, C.; da Cunha, H.B. Factors controlling water-column respiration in rivers of the central and southwestern Amazon Basin. *Limnol. Oceanogr.* 2012, 57, 527–540.
37. Espinoza, J.C.; Ronchail, J.; Guyot, J.L.; Junquas, C.; Vauchel, P.; Lavado, W.; Drapeau, G.; Pombosa, R. Climate variability and extreme drought in the upper

- Solimões River (western Amazon Basin): Understanding the exceptional 2010 drought. *Geophys. Res. Lett.* 2011, 38, n/a-n/a.
38. Farella, N.; Lucotte, M.; Louchouart, P.; Roulet, M. Deforestation modifying terrestrial organic transport in the Rio Tapajós, Brazilian Amazon. *Organic Geochemistry* 2001, 32, 1443–1458.
39. Fearnside, P.M. Land-tenure issues as factors in environmental destruction in Brazilian Amazônia: The case of southern Pará. *World Development* 2001, 29, 1361–1372.
40. Feitosa, I.B.; Huszar, V.L.M.; Domingues, C.D.; Appel, E.; Paranhos, R.; Almeida, R.M.; Branco, C.W.C.; Bastos, W.R.; Sarmento, H. Plankton community interactions in an Amazonian floodplain lake, from bacteria to zooplankton. *Hydrobiologia* 2019, 831, 55–70.
41. Fernandes, P.C.C.; Grise, M.M.; Alves, L.W.R.; Filho, A.S.; Dias-Filho, M.B. *Diagnóstico e Modelagem da Integração Lavoura-Pecuária na Região de Paragominas, PA; Embrapa Amazônia Oriental: Belém, Brazil, 2008;*
42. Figueiredo, R. de O. Processos hidrológicos e biogeoquímicos em bacias hidrográficas sob usos agrícola e agroflorestal na Amazônia Brasileira. In *Alternativa Agroflorestal na Amazônia em Transformação*; Porro, R., Ed.; Embrapa Informação Tecnológica: Brasília, DF, 2009; pp. 477–500.
43. Figueiredo, R. de O.; Börner, J.; Davidson, E.A. Watershed services payments to smallholders in the Brazilian Amazon: challenges and perspectives. *Revista Ambiente & Água* 2013, 8, 6–17.
44. Figueiredo, R.O.; Markewitz, D.; Davidson, E. a.; Schuler, A.E.; dos S. Watrin, O.; de Souza Silva, P. Land-use effects on the chemical attributes of low-order streams in the eastern Amazon. *Journal of Geophysical Research* 2010, 115, G04004–G04004.

45. Forti, M.C.; Boulet, R.; Melfi, A.J.; Neal, C. Hydrogeochemistry of a small catchment in northeastern Amazonia: A comparison between natural with deforested parts of the catchment (Serra do Navio, Amapá state, Brazil). 17.
46. Germer, S.; Neill, C.; Krusche, A.V.; Elsenbeer, H. Influence of land-use change on near-surface hydrological processes: Undisturbed forest to pasture. *Journal of Hydrology* 2010, 380, 473–480.
47. Germer, S.; Neill, C.; Vetter, T.; Chaves, J.; Krusche, A.V.; Elsenbeer, H. Implications of long-term land-use change for the hydrology and solute budgets of small catchments in Amazonia. *Journal of Hydrology* 2009, 364, 349–363.
48. Gomig, E.G. Capacidade de Suporte Natural: caracterização da região do Médio Vale do Araguaia, Estado do Mato Grosso. 137.
49. Grimaldi, C.; Grimaldi, M.; Millet, A.; Bariac, T.; Boulègue, J. Behaviour of chemical solutes during a storm in a rainforested headwater catchment. *Hydrol. Process.* 2004, 18, 93–106.
50. Hayhoe, S.J.; Neill, C.; Porder, S.; McHorney, R.; LeFebvre, P.; Coe, M.T.; Elsenbeer, H.; Krusche, A.V. Conversion to soy on the Amazonian agricultural frontier increases streamflow without affecting stormflow dynamics. *Global Change Biology* 2011, 17, 1821–1833.
51. Hedges, J.I.; Clark, W.A.; Quay, P.D.; Richey, J.E.; Devol, A.H.; Santos, M. Compositions and fluxes of particulate organic material in the Amazon River1: Amazon River particulate material. *Limnol. Oceanogr.* 1986, 31, 717–738.
52. Hedges, J.I.; Mayorga, E.; Tsamakis, E.; McClain, M.E.; Aufdenkampe, A.; Quay, P.; Richey, J.E.; Benner, R.; Opsahl, S.; Black, B.; et al. Organic matter in Bolivian tributaries of the Amazon River: A comparison to the lower mainstream. *Limnol. Oceanogr* 2000, 45, 1449–1466.

53. Herpin, U.; Cerri, C.C.; Carvalho, M.C.S.; Markert, B.; Enzweiler, J.; Friese, K.; Breulmann, G. Biogeochemical dynamics following land use change from forest to pasture in a humid tropical area (Rondônia, Brazil): A multi-element approach by means of XRF-spectroscopy. 2002, 13.
54. Hölscher, D.; Sá, T.D. de A.; Möller, R.F.; Denich, M.; Fölster, H. Rainfall partitioning and related hydrochemical fluxes in a diverse and in a mono specific (*Phenakospermum guyannense*) secondary vegetation stand in eastern Amazonia. *Oecologia* 1998, 114, 251–257.
55. Johnson, M.S.; Lehmann, J.; Couto, E.G.; Filho, J.P.N.; Riha, S.J. DOC and DIC in flowpaths of Amazonian headwater catchments with hydrologically contrasting soils. *Biogeochemistry* 2006, 81, 45–57.
56. Johnson, M.S.; Lehmann, J.; Riha, S.J.; Krusche, A.V.; Richey, J.E.; Ometto, J.P.H.B.; Couto, E.G. CO<sub>2</sub> efflux from Amazonian headwater streams represents a significant fate for deep soil respiration. *Geophys. Res. Lett.* 2008, 35, L17401.
57. Johnson, M.S.; Lehmann, J.; Selva, E.C.; Abdo, M.; Riha, S.; Couto, E.G. Organic carbon fluxes within and streamwater exports from headwater catchments in the southern Amazon. *Hydrological Processes* 2006, 20, 2599–2614.
58. Johnson, M.S.; Weiler, M.; Couto, E.G.; Riha, S.J.; Lehmann, J. Storm pulses of dissolved CO<sub>2</sub> in a forested headwater Amazonian stream explored using hydrograph separation. *Water Resources Research* 2007, 43, 1–8.
59. Jordan, C.F. The nutrient balance of an Amazonian rain forest. *Ecology* 1982, 63, 647–654.
60. Krusche, A.V.; Victoria, M.; Ballester, R.; Victoria, R.L.; Correa, M.; Leite, N.K.; Hanada, L.; Victoria, D.D.C.; Marcondes, A.; Ometto, J.P.; et al. Efeitos das mudanças



- do uso da terra na biogeoquímica dos corpos d'água da bacia do rio Ji-Paraná, Rondônia. *Acta Amazonica* 2005, 35, 197–205.
61. Lacerda, L.D.; Bastos, W.R.; Almeida, M.D. The impacts of land use changes in the mercury flux in the Madeira River, Western Amazon. *An. Acad. Bras. Ciênc.* 2012, 84, 69–78.
62. Lechler, P. Elevated mercury concentrations in soils, sediments, water, and fish of the Madeira River basin, Brazilian Amazon: a function of natural enrichments? *The Science of The Total Environment* 2000, 260, 87–96.
63. Leite, N.K.; Krusche, A.V.; Cabianchi, G.M.; Ballester, M.V.R.; Victoria, R.L.; Marchetto, M.; Santos, J.G. dos Groundwater quality comparison between rural farms and riparian wells in the western Amazon, Brazil. *Química Nova* 2011, 34, 11–15.
64. Lindell, L.; Åström, M.; Öberg, T. Land-use change versus natural controls on stream water chemistry in the Subandean Amazon, Peru. *Applied Geochemistry* 2010, 25, 485–495.
65. Lopes, E.; Soares-Filho, B.; Souza, F.; Rajão, R.; Merry, F.; Carvalho Ribeiro, S. Mapping the socio-ecology of Non Timber Forest Products (NTFP) extraction in the Brazilian Amazon: The case of açaí (*Euterpe precatoria* Mart) in Acre. *Landscape and Urban Planning* 2019, 188, 110–117.
66. Macedo, M.N.; DeFries, R.S.; Morton, D.C.; Stickler, C.M.; Galford, G.L.; Shimabukuro, Y.E. Decoupling of deforestation and soy production in the southern Amazon during the late 2000s. *Proceedings of the National Academy of Sciences* 2012, 109, 1341–1346.
67. Macedo, M.N.; Coe, M.T.; Defries, R.; Uriarte, M.; Brando, P.M.; Neill, C.; Walker, W.S. Land-use-driven stream warming in southeastern Amazonia Land-use-

- driven stream warming in southeastern Amazonia. *Philosophical transactions of the Royal Society of London. Series B, Biological sciences* 2013, 368.
68. Mainville, N.; Webb, J.; Lucotte, M.; Davidson, R.; Betancourt, O.; Cueva, E.; Mergler, D. Decrease of soil fertility and release of mercury following deforestation in the Andean Amazon, Napo River Valley, Ecuador. *Science of The Total Environment* 2006, 368, 88–98.
69. Marengo, J.A.; Tomasella, J.; Uvo, C.R. Trends in streamflow and rainfall in tropical South America: Amazonia, eastern Brazil, and northwestern Peru. *Journal of Geophysical Research* 1998, 103, 1775–1783.
70. Markewitz, D.; Davidson, E.A.; Figueiredo, R. d. O.; Victoria, R.L.; Krusche, A.V. Control of cation concentrations in stream waters by surface soil processes in an Amazonian watershed. *Nature* 2001, 410, 802–805.
71. Markewitz, D.; Davidson, E.; Moutinho, P.; Nepstad, D. Nutrient loss and redistribution after forest clearing on a highly weathered soil in Amazonia. *Ecological Applications* 2004, 14, 177–199.
72. Markewitz, D.; Figueiredo, R. d. O.; Davidson, E.A. CO<sub>2</sub>-driven cation leaching after tropical forest clearing. *Journal of Geochemical Exploration* 2006, 88, 214–219.
73. Markewitz, D.; Lamon, E.C.; Bustamante, M.C.; Chaves, J.; Figueiredo, R.O.; Johnson, M.S.; Krusche, A.; Neill, C.; Silva, J.S.O. Discharge–calcium concentration relationships in streams of the Amazon and Cerrado of Brazil: soil or land use controlled. *Biogeochemistry* 2011, 105, 19–35.
74. Mayorga, E.; Aufdenkampe, A. Processing of bioactive elements in the Amazon River System. In *The Ecohydrology of South American Rivers and Wetlands*; 2002.

75. McClain, M.E.; Elsenbeer, H. Terrestrial inputs to Amazon streams and internal biogeochemical processing. In *The Biogeochemistry of the Amazon Basin*; McClain, M.E., Victoria, R.L., Richey, J.E., Eds.; Oxford University Press; pp. 185–208.
76. McClain, M.E.; Cossío, R.E. The use of riparian environments in the rural Peruvian Amazon. *Environmental Conservation* 2003, 30, 242–248.
77. McClain, M.E.; Richey, J.E.; Brandes, J.A.; Pimentel, T.P. Dissolved organic matter and terrestrial-lotic linkages in the central Amazon basin of Brazil. *Global Biogeochemical Cycles* 1997, 11, 295–311.
78. Mertes, L.A.K.; Daniel, D.L.; Melack, J.M.; Nelson, B.; Martinelli, L.A.; Forsberg, B.R. Spatial patterns of hydrology, geomorphology, and vegetation on the floodplain of the Amazon river in Brazil from a remote sensing perspective. *Geomorphology* 1995, 13, 215–232.
79. Monteiro, M.T.F.; Tomasella, J.; Candido, L.A.; Luizão, F. Application of D-SEM to a catchment in Central Amazonia: calibration and validation of the carbon and nitrogen cycles. *Ecohydrology & Hydrobiology* 2015, 15, 192–207.
80. Moreira-Turcq, P.; Seyler, P.; Guyot, J.L.; Etcheber, H. Exportation of organic carbon from the Amazon River and its main tributaries. *Hydrol. Process.* 2003, 17, 1329–1344.
81. Moreira-Turcq, P.; Barroux, G.; Bernardes, M. Dynamics of organic carbon between the Amazon River and flood plain lakes. 9.
82. Mortatti, J.; Ferreira, J.R.; Martinelli, L.A.; Victoria, R.L.; Tancredi, A.C.F. Biogeochemistry of the Madeira river basin. *GeoJournal* 1989, 19.
83. Neill, C.; Chaves, J.E.; Biggs, T.; Deegan, L.A.; Elsenbeer, H.; Figueiredo, R. d. O.; Germer, S.; Johnson, M.S.; Lehmann, J.; Markewitz, D.; et al. Runoff sources and

- land cover change in the Amazon: An end-member mixing analysis from small watersheds. *Biogeochemistry* 2011, 105, 7.
84. Neill, C.; Coe, M.T.; Riskin, S.H.; Krusche, A.V.; Elsenbeer, H.; Macedo, M.N.; McHorney, R.; Lefebvre, P.; Davidson, E.A.; Scheffler, R.; et al. Watershed responses to Amazon soya bean cropland expansion and intensification. *Phil. Trans. R. Soc. B* 2013, 368, 20120425.
85. Neill, C.; Deegan, L.A.; Thomas, S.M.; Hauptert, C.L.; Krusche, A.V.; Ballester, V.M.; Victoria, R.L. Deforestation alters the hydraulic and biogeochemical characteristics of small lowland Amazonian streams. *Hydrological Processes* 2006, 20, 2563–2580.
86. Neill, C.; Elsenbeer, H.; Krusche, A.V.; Lehmann, J.; Markewitz, D.; de O. Figueiredo, R. Hydrological and biogeochemical processes in a changing Amazon: results from small watershed studies and the large-scale biosphere-atmosphere experiment. *Hydrological Processes* 2006, 20, 2467–2476.
87. Neill, C.; Jankowski, K.; Brando, P.M.; Coe, M.T.; Deegan, L.A.; Macedo, M.N.; Riskin, S.H.; Porder, S.; Elsenbeer, H.; Krusche, A.V. Surprisingly modest water quality Impacts from expansion and intensification of large-scale commercial agriculture in the Brazilian Amazon-Cerrado region. *Tropical Conservation Science* 2017, 10, 194008291772066.
88. Neill, C.; Piccolo, M.C.; Cerri, C.C.; Stuedler, P.A.; Melillo, J.M. Soil solution nitrogen losses during clearing of lowland Amazon forest for pasture. *Plant Soil* 2006, 281, 233–245.
89. Neu, V.; Neill, C.; Krusche, A.V. Gaseous and fluvial carbon export from an Amazon forest watershed. *Biogeochemistry* 2011, 105, 133–147.

90. Nóbrega, R.L.B.; Guzha, A.C.; Torres, G.N.; Kovacs, K.; Lamparter, G.; Amorim, R.S.S.; Couto, E.; Gerold, G. Effects of conversion of native cerrado vegetation to pasture on soil hydro-physical properties, evapotranspiration and streamflow on the Amazonian agricultural frontier. *PLoS ONE* 2017, 12, e0179414.
91. Nóbrega, R.L.B.; Guzha, A.C.; Lamparter, G.; Amorim, R.S.S.; Couto, E.G.; Hughes, H.J.; Jungkunst, H.F.; Gerold, G. Impacts of land-use and land-cover change on stream hydrochemistry in the Cerrado and Amazon biomes. *Science of The Total Environment* 2018, 635, 259–274.
92. Parry, L.; Peres, C.A.; Day, B.; Amaral, S. Rural-urban migration brings conservation threats and opportunities to Amazonian watersheds: Rural-urban migration in Amazonia. *Conservation Letters* 2010, 3, 251–259.
93. Pocewicz, A.; Garcia, E. Deforestation facilitates widespread stream habitat and flow alteration in the Brazilian Amazon. *Biological Conservation* 2016, 203, 252–259.
94. Poitrasson, F.; Cruz Vieira, L.; Seyler, P.; Márcia dos Santos Pinheiro, G.; Santos Mulholland, D.; Bonnet, M.-P.; Martinez, J.-M.; Alcantara Lima, B.; Resende Boaventura, G.; Chmeleff, J.; et al. Iron isotope composition of the bulk waters and sediments from the Amazon River Basin. *Chemical Geology* 2014, 377, 1–11.
95. Remington, S.; Krusche, A.; Richey, J. Effects of DOM photochemistry on bacterial metabolism and CO<sub>2</sub> evasion during falling water in a humic and a whitewater river in the Brazilian Amazon. *Biogeochemistry* 2011, 105, 185–200.
96. Richey, J.E.; Meade, R.H.; Salati, E.; Devol, A.H.; Nordin, Jr., C.F.; Dos Santos, U. Water discharge and suspended sediment concentrations in the Amazon River: 1982-1984. *Water Resources Research* 1986, 22, 756–764.
97. Richey, J.E.; Salati, E.; Dos Santos, U. Biogeochemistry of the Amazon River: An update. *Mitt. Geol-Palaont. Inst* 1985, 58, 245–257.

98. Richey, J.E.; Hedges, J.I.; Devol, A.H.; Quay, P.D.; Victoria, R.; Martinelli, L.; Forsberg, B.R. Biogeochemistry of carbon in the Amazon River. *Limnol. Oceanogr.* 1990, 35, 352–371.
99. Richey, J.E.; Melack, J.M.; Aufdenkampe, A.K.; Ballester, V.M.; Hess, L.L. Outgassing from Amazonian rivers and wetlands as a large tropical source of atmospheric CO<sub>2</sub>. *Nature* 2002, 416, 617–620.
100. Riskin, S.H.; Neill, C.; Jankowski, K.; Krusche, A.V.; McHorney, R.; Elsenbeer, H.; Macedo, M.N.; Nunes, D.; Porder, S. Solute and sediment export from Amazon forest and soybean headwater streams. *Ecol Appl* 2017, 27, 193–207.
101. Roa-García, M.C.; Brown, S.; Schreier, H.; Lavkulich, L.M. The role of land use and soils in regulating water flow in small headwater catchments of the Andes. *Water Resour. Res.* 2011, 47.
102. Rodriguez, D.A.; Tomasella, J.; Linhares, C. Is the forest conversion to pasture affecting the hydrological response of Amazonian catchments? Signals in the Ji-Paraná Basin. *Hydrol. Process.* 2010, n/a-n/a.
103. Rosa, M.B.S. da; Figueiredo, R.D.O.; Markewitz, D.; Krusche, A.V.; Costa, F.F.; Gerhard, P. Evasion of CO<sub>2</sub> and dissolved carbon in river waters of three small catchments in an area occupied by small family farms in the eastern Amazon. *Rev. ambiente água* 2017, 12, 556.
104. Rueda-Delgado, G.; Wantzen, K.M.; Tolosa, M.B. Leaf-litter decomposition in an Amazonian floodplain stream: effects of seasonal hydrological changes. *Journal of the North American Benthological Society* 2006, 25, 233–249.
105. Salimon, C.; dos Santos Sousa, E.; Alin, S.R.; Krusche, A.V.; Ballester, M.V. Seasonal variation in dissolved carbon concentrations and fluxes in the upper Purus River, southwestern Amazon. *Biogeochemistry* 2013, 114, 245–254.

106. Saunders, T.J.; McClain, M.E.; Llerena, C.A. The biogeochemistry of dissolved nitrogen, phosphorus, and organic carbon along terrestrial-aquatic flowpaths of a montane headwater catchment in the Peruvian Amazon. *Hydrological Processes* 2006, 20, 2549–2562.
107. Sawakuchi, H.O.; Neu, V.; Ward, N.D.; Barros, M. de L.C.; Valerio, A.M.; Gagne-Maynard, W.; Cunha, A.C.; Less, D.F.S.; Diniz, J.E.M.; Brito, D.C.; et al. Carbon dioxide emissions along the lower Amazon River. *Front. Mar. Sci.* 2017, 4.
108. Scheffler, R.; Neill, C.; Krusche, A.V.; Elsenbeer, H. Soil hydraulic response to land-use change associated with the recent soybean expansion at the Amazon agricultural frontier. *Agriculture, Ecosystems & Environment* 2011, 144, 281–289.
109. Schroth, G.; D'Angelo, S.A.; Teixeira, W.G.; Haag, D.; Lieberei, R. Conversion of secondary forest into agroforestry and monoculture plantations in Amazonia: consequences for biomass, litter and soil carbon stocks after 7 years. *Forest Ecology and Management* 2002, 163, 131–150.
110. Seidel, M.; Dittmar, T.; Ward, N.D.; Krusche, A.V.; Richey, J.E.; Yager, P.L.; Medeiros, P.M. Seasonal and spatial variability of dissolved organic matter composition in the lower Amazon River. *Biogeochemistry* 2016, 131, 281–302.
111. Selva, E.C.; Couto, E.G.; Johnson, M.S.; Lehmann, J. Litterfall production and fluvial export in headwater catchments of the southern Amazon. *J. Trop. Ecol.* 2007, 23, 329–335.
112. Seyler, P.T.; Boaventura, G.R. Distribution and partition of trace metals in the Amazon basin. *Hydrological Processes* 2003, 17, 1345–1361.
113. Shimizu, M.K.; Kato, O.R.; Figueiredo, R. de O.; Silva, S. Agriculture without burning: restoration of altered areas with chop-and-mulch sequential agroforestry systems in the Amazon region. 8.

114. Sommer, R.; Sá, T.D. de A.; Vielhauer, K.; Araújo, A.C. de; Fölster, H.; Vlek, P.L.G. Transpiration and canopy conductance of secondary vegetation in the eastern Amazon. *Agricultural and Forest Meteorology* 2002, 112, 103–121.
115. Sommer, R.; Vlek, P.L.G.; Deane de Abreu Sá, T.; Vielhauer, K.; de Fátima Rodrigues Coelho, R.; Fölster, H. Nutrient balance of shifting cultivation by burning or mulching in the Eastern Amazon – evidence for subsoil nutrient accumulation. *Nutrient Cycling in Agroecosystems* 2004, 68, 257–271.
116. Sousa, R.S. de; Menezes, L.G.C. de; Felizzola, J.F.; Figueiredo, R. de O.; Sá, T.D. de A.; Guerra, G.A.D. Água e saúde no município de Igarapé-Açu, Pará. *Saúde e Sociedade* 2016, 25, 1095–1107.
117. Tardy, Y.; Bustillo, V.; Roquin, C.; Mortatti, J.; Victoria, R. The Amazon. Biogeochemistry applied to river basin management. *Applied Geochemistry* 2005, 20, 1746–1829.
118. Tardy, Y.; Mortatti, J.; Victoria, R.; Martinelli, L.; Ribeiro, A.; Cerri, C.; Piccolo, M.; de Moraes, J.L.; Probst, J.L.; Andreux, F.; et al. Hydroclimatology and biogeochemistry of the Amazon 1. Erosion. *Chemical Geology* 1993, 107, 333–336.
119. Thomas, S.M.; Neill, C.; Deegan, L. a.; Krusche, A.V.; Ballester, V.M.; Victoria, R.L. Influences of land use and stream size on particulate and dissolved materials in a small Amazonian stream network. *Biogeochemistry* 2004, 68, 135–151.
120. Tomasella, J.; Neill, C.; Figueiredo, R. d. O.; Nobre, A.D. Water and chemical budgets at the catchment scale including nutrient exports from intact forests and disturbed landscapes. In *Amazonia and Global Change*; Keller, M., Bustamante, M., Gash, J., Dias, P.S., Eds.; American Geophysical Union: Washington, DC, 2009; pp. 505–524.



121. Townsend-Small, A.; McClain, M.E.; Brandes, J.A. Contributions of carbon and nitrogen from the Andes Mountains to the Amazon River: Evidence from an elevational gradient of soils, plants, and river material. *Limnology and Oceanography* 2005, 50, 672–685.
122. Townsend-Small, A.; Noguera, J.L.; McClain, M.E.; Brandes, J.A. Radiocarbon and stable isotope geochemistry of organic matter in the Amazon headwaters, Peruvian Andes. *Global Biogeochem. Cycles* 2007, 21, n/a-n/a.
123. Victoria, D.C.; Santiago, A.V.; Ballester, M.V.R.; Pereira, A.R.; Victoria, R.L.; Richey, J.E. Water Balance for the Ji-Paraná River Basin, Western Amazon, Using a Simple Method through Geographical Information Systems and Remote Sensing. *Earth Interactions* 2007, 11, 1–22.
124. Viers, J.; Barroux, G.; Pinelli, M.; Seyler, P.; Oliva, P.; Dupré, B.; Boaventura, G.R. The influence of the Amazonian floodplain ecosystems on the trace element dynamics of the Amazon River mainstem (Brazil). *Science of The Total Environment* 2005, 339, 219–232.
125. Wickel, A.J.; van de Giesen, N.C.; Sáa, T.D. d A. Stormflow generation in two headwater catchments in eastern Amazonia, Brazil. *Hydrological Processes* 2008, 22, 3285–3293.
126. Wickel, B. Water and nutrient dynamics of a humid tropical agricultural watershed in Eastern Amazonia; Ecology and Development Series; Zentrum für Entwicklungsforschung/University of Bonn: Bonn, Switzerland, 2004;
127. Williams, M.R.; Fisher, T.R.; Melack, J.M. Solute dynamics in soil water and groundwater in a central Amazon catchment undergoing deforestation. *Biogeochemistry* 1997, 38, 303–335.

128. Williams, M.R.; Melack, J.M. Solute export from forested and partially deforested catchments in the central Amazon. *Biogeochemistry* 1997, 38, 67–102.
129. Williams, M.R.; Filoso, S.; Lefebvre, P. Effects of land-use change on solute fluxes to floodplain lakes of the central Amazon. *Biogeochemistry* 2004, 68, 259–275.
130. Zanchi, F.B.; Waterloo, M.J.; Tapia, A.P.; Alvarado Barrientos, M.S.; Bolson, M.A.; Luizão, F.J.; Manzi, A.O.; Dolman, A.J. Water balance, nutrient and carbon export from a heath forest catchment in central Amazonia, Brazil: Nutrient and carbon export from Campina Forest. *Hydrol. Process.* 2015, 29, 3633–3648.