

Table S1 PRISMA Framework Checklist

<p>1. Title</p>	<p>Telecoupling Research: The First Five Years</p>
<p>2. Abstract</p>	<p>In an increasingly interconnected world, human-environment interactions involving flows of people, organisms, goods, information, and energy are expanding in magnitude and extent, often over long distances. As a universal paradigm for examining these interactions, the telecoupling framework (published in 2013) has been broadly implemented across the world by researchers from diverse disciplines. We conducted a systematic review of the first five years of telecoupling research to evaluate the state of telecoupling science and identify strengths, areas to be improved, and promising avenues for future study. We identified 89 studies using any derivation of the term telecoupling. These works emphasize trade flows, information transfer, and species dispersal at international, national, and regional scales involving one or a few countries, with China, Brazil, and the United States being the most frequently studied countries. Our review showed a rising trend in publications and citations on telecoupling, with 63% of identified telecoupling studies using the framework’s specific language (e.g., “flows”, “agents”, etc.). This result suggests that future telecoupling studies could apply the standardized telecoupling language and terminology to better coordinate, synthesize, and operationalize interdisciplinary research. Compelling topics for future research include operationalization of the telecoupling framework, commonalities among telecouplings, telecoupling mechanisms and causality, and telecoupled systems governance. Overall, the first five years of telecoupling research have improved our understanding of human-environment interactions, laying a promising foundation for future social-ecological research in a telecoupled world.</p>
<p>3. Rationale</p>	<p>In the first five years of its existence, the telecoupling framework has been implemented across the world, in both terrestrial and aquatic environments, and from the lens of a wide array of disciplinary and interdisciplinary approaches. Up to this point, no synthesis work has been conducted to systematically aggregate, summarize, and synthesize the findings of telecoupling research. The results of this analysis paint a clear picture of the field of telecoupling research over the past five years and help to identify research areas in which telecoupling has a strong presence as well as those in which there is substantial potential for expansion.</p>
<p>4. Objectives</p>	<p>The main objective is to review the first five years of telecoupling research, synthesize research findings, and identify promising avenues for new research.</p>

5. Protocol for review and registration	Codebook (Table S2)
6. Eligibility	Publications were eligible for inclusion if they were (a) published in English, (b) published after 1 January 2013, (c) published in peer-reviewed journals, book chapters, or reports.
7. Information sources	Papers for review have been collected from Web of Knowledge as well as from peer-reviewed journals and book chapters identified by the co-authors; no additional information was acquired.
8. Search	Publications were derived from a topic search on the Web of Knowledge on 1 July 2018 (Topic = telecoup* OR tele-coup*; Timespan of publication = 2013-2018; Search language = English). As Web of Knowledge includes all major journals in which known telecoupling papers have been published, no other databases were included. Additional papers missing from the Web of Science search were identified and added to the analysis by co-authors. Each selected publication was systematically coded according to the criteria listed in section 11. The English language criterion was included because international journals typically publish in English. Additionally, our limited knowledge of other languages would have created a strong bias towards the few languages outside English in which we had sufficient proficiency to read academic papers.
9. Study selection	Publications identified from the Web of Knowledge search were further screened from their title, abstract, and keywords. Potential publications were selected for inclusion in the analysis if they include any derivative of the word “telecoupling” in their title, keywords, or abstract.
10. Data collection	Selected cases were screened by the primary authors to ensure they fit the criteria for selection (namely that they contain at least one of the words “telecoupling”, “telecoupled”, “tele-coupling” or “tele-coupled” in their title, abstract, or keywords). Once selected papers are identified, they were independently reviewed and coded by co-authors with expertise in the subject area.
11. Data items	Each selected publication was analyzed to determine the scale(s) of analyses (e.g., local, national), region(s) studied (e.g., South America), countries studied, number of countries studied, telecoupling flow type (migration, investment, agricultural trade, etc.), number of times cited, and future directions for telecoupling research identified. Definitions and criteria for each of these categories were incorporated into a codebook created by the primary authors (K.K. and C.H.) that was made available for all co-authors during review (see table S2). The primary authors each coded two studies independently before distributing to ensure that coding criteria were standardized. Papers were then be coded by co-authors.

	Results from the coding of papers selected for review were collated and reviewed by the primary authors.
12. Risk of bias of individual	We assumed that all studies applying the telecoupling concept or framework would use “telecoupling” in their titles, keywords, or abstracts. However, some telecoupling-related studies may have been excluded from the analysis if they used the telecoupling framework, but did not feature it in their titles, keywords, or abstracts. We also assumed that when the authors of the reviewed publications used the terminology of the telecoupling framework (e.g., by labelling components), that they were using the framework to structure their analyses. In other words, we assumed that any component labelled (e.g., “sending system”) was attributed to part of the telecoupling framework rather than a grammatical coincidence.
13. Summary measures	Coded analyses from reviewed studies were summarized by their absolute and their relative frequency. Within each category, all cases had an equal weight in this review.
14. Synthesis of results	We identified important trends and gaps in telecoupling research based on the results of this analysis.
15. Risk of bias across studies	We ran the risk of biasing the geographic scope of analyses by only analyzing paper published in English. It may be the case that papers fitting our coding criteria have been published in other languages.
16. Additional analysis	No additional analyses were performed.
17. Study selection	The systematic search in Web of Science returned 74 publications fitting the criteria for inclusion in the study. Fifteen additional publications were identified by co-authors for inclusion in the study, resulting in a sample size of 89 publications.
18. Study characteristics	N/A
19. Risk of bias within studies	Authors of the reviewed publications may have incorrectly or inconsistently utilized the telecoupling framework. Additionally, they may not have published a complete report of the telecoupling process being studied.
20. Results of individual studies	See Table S3.
21. Synthesis of results	Telecoupling studies have been published in 47 different publications between 2013 and July of 2018. Countries from six continents have been examined through the lens of telecoupling. The most commonly analyzed flow type was trade, followed by knowledge transfer.
22. Risk of bias across studies	Despite the use of a codebook, individual reviewers of the reviewed publications may have coded the publications differently (e.g., by applying their own knowledge of telecoupling to interpret the intentions

	of the publication authors rather than directly analyzing the authors' words).
23. Additional analysis	N/A
24. Summary of evidence	<p>Three different applications of “telecoupling” were revealed through the literature review. “Phenomenon” papers were those that mentioned the word telecoupling, but outside of the context of the research that was being conducted (e.g., telecoupling was a keyword or appeared in the abstract but was not mentioned any other time). “Concept” papers used the word telecoupling at least once in the context of the research being conducted. “Framework” papers applied the telecoupling framework by labelling at least one component of the study system(s) according to the telecoupling framework (e.g., identified sending and receiving systems). Four primary themes in the telecoupling emerged from the literature review: novel hypothesis generation, the identification of knowledge gaps, the identification of spillover systems, and the assessment of feedbacks, trade-offs, and synergies of telecoupled systems. However, the framework still has many areas for improvement, including operationalization of the framework, analysis of spillover systems, cross-disciplinary analyses, identifying the processual commonalities behind telecoupling processes, identifying the mechanisms by which telecouplings occur, and identifying the role of governance and institutional change in telecoupled systems.</p>
25. Limitations	<p>Because the field of telecoupling research is new and has been applied to many disciplines, it can be difficult to make broad generalizations about the patterns discovered by the literature review. Additionally, the wide degree to which telecoupling has been used in the literature also contributed to the difficulty of generalizations (e.g., just being mentioned once in the abstract or an entire paper dedicated to analyzing the ways in which a particular situation can be classified under the telecoupling framework).</p>
26. Conclusion	<p>Many of the important contributions of the telecoupling framework are attributable to its novel, systematic, and socio-ecologically integrative structure. As a paradigm that explicitly synthesizes socioeconomic and environmental information over distances, the telecoupling framework advances monothematic research approaches (e.g., those that only consider human or environmental perspectives at a single place) by providing social-ecological context for distant interactions and the systems, flows, agents, causes, and effects involved. In so doing, the telecoupling framework facilitates a broader, deeper understanding of complexity than was formerly possible. The telecoupling framework is</p>

	<p>highly flexible (i.e., useful in diverse fields) and applicable (e.g., conducive for translating science into policy and management strategies). Ultimately, these characteristics of the telecoupling framework allow researchers and managers, among others, to advance the science and practice of sustainability in ways that utilize information on both local and distant socioeconomic and environmental interactions. This unique ability separates the telecoupling framework from many other research approaches and helps explain its growing importance across diverse disciplines. The past five years have resulted in a solid foundation of telecoupling research with a future even more promising as new avenues for investigation and application arise.</p>
<p>27. Funding</p>	<p>J.G.Z. was supported by the Swiss Programme for Research on Global Issues for Development (r4d programme), which is funded by the Swiss National Science Foundation (SNSF) and the Swiss Agency for Development and Cooperation (SDC), under grant number 400440 152167. A.K.C. was supported by the University Distinguished Fellowship and Robert C. Ball and Betty A. Ball Fisheries and Wildlife Fellowship [Michigan State University], the NASA-MSU Professional Enhancement Award, and the United States Department of Agriculture National Institute of Food and Agriculture [grant number MICL04161]. Y.L. was supported by the Environmental Science and Policy Program Fellowship. C. H. and Y. Dou were supported by the National Science Foundation Complex Dynamics of Telecoupled Human and Natural Systems, grant number 1518518. E.K.B. was supported by the NASA-MSU Professional Enhancement Award. K.E.K. was supported by the William W. and Evelyn M. Taylor Endowed Fellowship for International Engagement in Coupled Humans and Natural Systems. R.F.B.S. was supported by grants from Fundação de Amparo à Pesquisa do Estado de São Paulo (grant numbers 15/25892-7 and 14/50628-9). Y.Du. was supported by the NASA-MSU Professional Enhancement Award and China Scholarship Council. D. Y. was supported by NASA-MSU Professional Enhancement Award. J.L. was supported by the U.S. National Science Foundation, NASA, and Michigan AgBioResearch</p>

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Table S2 Codebook

Category	Description
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GEOGRAPHIC SCALE(S) OF ANALYSES	Geographic scale at which data were analyzed (local, regional, national, international). For instance, a study examining trade between the United States and China would be an international-scale study whereas a similar study investigating trade within China would be national-scale. Multiple scales of analysis are denoted using commas (i.e. National, Regional)
COUNTRIES STUDIED	Countries that were included in the analysis beyond simply being mentioned in Introduction or Discussion. If there are less than 5 focal countries, list by name. Otherwise, list as "multiple".
NUMBER OF COUNTRIES STUDIED	List the number of countries from which data were collected/analyzed.
REGION(S) STUDIED	Specific geographic locations that were evaluated (e.g., Heilongjiang Province, Matto Grosso). If the researchers use a specific province or region to represent a national-scale event, please cite the region or province that was analyzed, not the country. If an analysis was only conducted at the international scale (e.g., using international trade data), write "na".
TELECOUPLING FLOW TYPE	Category of flow(s) analyzed (e.g., migration, tourism, trade, technology transfer, investment, knowledge transfer, species dispersal, water transfer, waste transfer)
NUMBER OF TIMES CITED (GOOGLE SCHOLAR)	Citation number derived from Google Scholar search
NUMBER OF TIMES CITED (WEB OF SCIENCE)	Citation number derived from Web of Science Search
FUTURE DIRECTIONS FOR TELECOUPLING RESEARCH	Future directions for research and/or gaps in data/knowledge identified by the authors at the completion of their study (i.e. not the motivation for their study) as they relate to telecoupling research or the telecoupling framework.
TYPE OF TELECOUPLING STUDY	The studies in this review were classified as either “Phenomena”, “Concept”, or “Framework” based on their use of telecoupling. See below for details.
<i>PHENOMENA</i>	The word “telecoupling” (or any derivative of it; e.g., “telecoupled”) is used in any portion of the paper, but no other citations to telecoupling papers or further mentions of the word are included. For example, telecoupling is included in the keywords, but mentioned nowhere else and the content of the paper appears unrelated to telecoupling.
<i>CONCEPT</i>	The word “telecoupling” is used in the specific context of the research. Study topics are characterized as a telecoupled process, with some boundaries defined. However, the specific terminology of the telecoupling framework is not used.
<i>FRAMEWORK APPLICATION</i>	At least one component of the telecoupling framework is explicitly labeled AND telecoupling is mentioned. For example: “The agent in this system is a farmer.” It may be helpful to explicitly search for the components (i.e. agent, flow, sending system, receiving system, spillover system, causes, effects).
NOTES	Explanations for any comments, uncertainties, or concerns

Table S3. Reviewed Telecoupling Literature

#	Title	Authors	Publication Name	Year	Volume	Issue	Telecoupling Use Type
1	Distal impacts of aquarium trade: Exploring the emerging sandhopper (<i>Orchestoidea tuberculata</i>) artisanal shore gathering fishery in Chile	Tapia-Lewin, Sebastian; Vergara, Karina; De La Barra, Christian; Godoy, Natalio; Carlos Castilla, Juan; Gelcich, Stefan	Ambio	2017	46	6	Phenomena
2	Adaptation of global land use and management intensity to changes in climate and atmospheric carbon dioxide.	Alexander, Peter; Rabin, Sam; Anthoni, Peter; Henry, Roslyn; Pugh, Thomas A M; Rounsevell, Mark D A; Arneth, Almut	Global Change Biology	2018	NA	NA	Phenomena
3	A proposal for the theoretical analysis of the interactive coupled effects between urbanization and the eco-environment in mega-urban agglomerations	Fang Chuanglin; Zhou Chenghu; Gu Chaolin; Chen Liding; Li Shuangcheng	Journal Of Geographical Sciences	2017	27	12	Phenomena
4	Evolving human landscapes: a virtual laboratory approach	Magliocca, Nicholas R.; Ellis, Erle C.	Journal Of Land Use Science	2016	11	6	Phenomena
5	Redefining community based on place attachment in a connected world	Gurney, Georgina G.; Blythe, Jessica; Adams, Helen; Adger, W. Neil; Curnock, Matthew; Faulkner, Lucy; James, Thomas; Marshall, Nadine A.	Proceedings Of The National Academy Of Sciences Of The United States Of America	2017	114	38	Phenomena
6	Have there been forest transitions? Forest transition theory revisited in the context of the Modifiable Areal Unit Problem	Kozak, Jacek; Szwagrzyk, Marcin	Area	2016	48	4	Phenomena
7	Evolving the Anthropocene: linking multi-level selection with long-term social-ecological change	Ellis, Erle C.; Magliocca, Nicholas R.; Stevens, Chris J.; Fuller, Dorian Q.	Sustainability Science	2018	13	1	Phenomena
8	Spatiotemporal Data Mining: A Computational Perspective	Shekhar, Shashi; Jiang, Zhe; Ali, Reem Y.; Eftelioglu, Emre; Tang, Xun; Gunturi, Venkata M. V.; Zhou, Xun	Isprs International Journal Of Geo-Information	2015	4	4	Phenomena
9	Conceptualizing Distal Drivers in Land Use Competition	Niewoehner, Joerg; Nielsen, Jonas O.; Gasparri, Ignacio; Gou, Yaqing; Hauge, Mads; Joshi, Neha; Schaffartzik, Anke; Sejersen, Frank; Seto, Karen C.; Shughrue, Chris	Land Use Competition: Ecological, Economic And Social Perspectives	2016	6	NA	Phenomena
10	Identification and apportionment of the drivers of land use change on a regional scale: Unbiased recursive partitioning-based stochastic model application	Wang, Qi; Ren, Qingfu; Liu, Jianfeng	Agriculture Ecosystems & Environment	2016	217	NA	Phenomena

11	Changes in Land-Use Governance in an Urban Era	Gentry, Bradford S.; Sikor, Thomas; Auld, Graeme; Bebbington, Anthony J.; Benjaminsen, Tor A.; Hunsberger, Carol A.; Izac, Anne-Marie; Margulis, Matias E.; Plieninger, Tobias; Schroeder, Heike; Upton, Caroline	Rethinking Global Land Use In An Urban Era	2014	NA	NA	Phenomena
12	The impacts of warfare and armed conflict on land systems	Baumann, Matthias; Kuemmerle, Tobias	Journal Of Land Use Science	2016	11	6	Concept
13	Complex problems and unchallenged solutions: Bringing ecosystem governance to the forefront of the UN sustainable development goals	Vasseur, Liette; Horning, Darwin; Thornbush, Mary; Cohen-Shacham, Emmanuelle; Andrade, Angela; Barrow, Ed; Edwards, Steve R.; Wit, Piet; Jones, Mike	Ambio	2017	46	7	Concept
14	International progress and evaluation on interactive coupling effects between urbanization and the eco-environment	Fang Chuanglin; Liu Haimeng; Li Guangdong	Journal of Geographical Sciences	2016	26	8	Concept
15	One Bioregion/One Health: An Integrative Narrative for Transboundary Planning along the US-Mexico Border.	Pezzoli, Keith; Kozo, Justine; Ferran, Karen; Wooten, Wilma; Gomez, Gudelia Rangel; Al-Delaimy, Wael K	Global Society : Journal Of Interdisciplinary International Relations	2014	28	4	Concept
16	Biodiversity and ecosystem services require IPBES to take novel approach to scenarios	Kok, Marcel T. J.; Kok, Kasper; Peterson, Garry D.; Hill, Rosemary; Agard, John; Carpenter, Stephen R.	Sustainability Science	2017	12	1	Concept
17	Conservation planning beyond giant pandas: the need for an innovative telecoupling framework	Wang, Fang; Liu, Jianguo	Science China-Life Sciences	2017	60	5	Concept
18	Snowlines and Treelines in the Tropical Andes	Young, Kenneth R.; Ponette-Gonzalez, Alexandra G.; Polk, Molly H.; Lipton, Jennifer K.	Annals Of The American Association Of Geographers	2017	107	2	Concept
19	A novel participatory and remote-sensing-based approach to mapping annual land use change on forest frontiers in Laos, Myanmar, and Madagascar.	Zaehringer, J. G., Llopis, J. C., Latthachack, P., Thein, T. T., & Heinimann, A.	Journal Of Land Use Science	2018	NA	NA	Concept
20	The dynamics of beef trade between Brazil and Russia and their environmental implications	Schierhorn, Florian; Meyfroidt, Patrick; Kastner, Thomas; Kuemmerle, Tobias; Prishchepov, Alexander V.; Mueller, Daniel	Global Food Security-Agriculture Policy Economics And Environment	2016	11	NA	Concept
21	Nuts About Gold: Competition for Land in Madre de Dios, Peru	Joshi, Neha	Land Use Competition: Ecological, Economic And Social Perspectives	2016	6	NA	Concept
22	Using social-ecological syndromes to understand impacts of international seafood trade on small-scale fisheries	Crona, B. I.; Van Holt, T.; Petersson, M.; Daw, T. M.; Buchary, E.	Global Environmental Change-Human And Policy Dimensions	2015	35	NA	Concept
23	Synthesis of human-nature feedbacks	Hull, Vanessa; Tuanniu, Mao-Ning; Liu, Jianguo	Ecology And Society	2015	20	3	Concept

24	Lessons from Local Studies for Global Sustainability	Liu, Jianguo; Hull, Vanessa; Yang, Wu; Vina, Andres; An, Li; Carter, Neil; Chen, Xiaodong; Liu, Wei; Ouyang, Zhiyun; Zhang, Hemin	Pandas And People: Coupling Human And Natural Systems For Sustainability	2016	NA	NA	Concept
25	Ecosystem Services from Transborder Migratory Species: Implications for Conservation Governance	Lopez-Hoffman, Laura; Chester, Charles C.; Semmens, Darius J.; Thogmartin, Wayne E.; Rodriguez-McGoffin, M. Sofia; Merideth, Robert; Diffendorfer, Jay E.	Annual Review Of Environment And Resources	2017	42	NA	Concept
26	Trading Land: A Review of Approaches to Accounting for Upstream Land Requirements of Traded Products	Schaffartzik, Anke; Haberl, Helmut; Kastner, Thomas; Wiedenhofer, Dominik; Eisenmenger, Nina; Erb, Karl-Heinz	Journal Of Industrial Ecology	2015	19	5	Concept
27	Significance of Telecoupling for Exploration of Land-Use Change	Eakin, Hallie; DeFries, Ruth; Kerr, Suzi; Lambin, Eric F.; Liu, Jianguo; Marcotullio, Peter J.; Messerli, Peter; Reenberg, Anette; Rueda, Ximena; Swaffield, Simon R.; Wicke, Birka; Zimmerer, Karl	Rethinking Global Land Use In An Urban Era	2014	NA	NA	Concept
28	Globalization's limits to the environmental state? Integrating telecoupling into global environmental governance	Lenschow, Andrea; Newig, Jens; Challies, Edward	Environmental Politics	2016	25	1	Concept
29	From teleconnection to telecoupling: taking stock of an emerging framework in land system science	Friis, Cecilie; Nielsen, Jonas Ostergaard; Otero, Iago; Haberl, Helmut; Niewoehner, Joerg; Hostert, Patrick	Journal Of Land Use Science	2016	11	2	Concept
30	Global Human Appropriation of Net Primary Production for Biomass Consumption in the European Union, 1986-2007	Kastner, Thomas; Erb, Karl-Heinz; Haberl, Helmut	Journal Of Industrial Ecology	2015	19	5	Concept
31	Integrating Modelling Approaches for Understanding Telecoupling: Global Food Trade and Local Land Use	Millington, James D. A.; Xiong, Hang; Peterson, Steve; Woods, Jeremy	Land	2017	6	3	Concept
32	Drivers of Human Stress on the Environment in the Twenty-First Century	Dietz, Thomas	Annual Review Of Environment And Resources	2017	42	NA	Concept
33	When ecosystems and their services are not co-located: oceans and coasts	Drakou, Evangelia G.; Pendleton, Linwood; Effron, Micah; Ingram, Jane Carter; Teneva, Lida	Ices Journal Of Marine Science	2017	74	6	Concept
34	Telecoupling between catch, farming, and international trade for the gastropods <i>Concholepas concholepas</i> (loco) and <i>Haliotis spp.</i> (abalone)	Carlos Castilla, Juan; Espinosa, Javiera; Yamashiro, Carmen; Melo, Oscar; Gelcich, Stefan	Journal Of Shellfish Research	2016	35	2	Concept
35	Drought impacts to water footprints and virtual water transfers of the Central Valley of California	Marston, Landon; Konar, Megan	Water Resources Research	2017	53	7	Concept

36	The Sino-Brazilian Telecoupled Soybean System and Cascading Effects for the Exporting Country	Bicudo da Silva, Ramon Felipe; Batistella, Mateus; Dou, Yue; Moran, Emilio; Torres, Sara McMillan; Liu, Jianguo	Land	2017	6	3	Framework
37	On the System. Boundary Choices, Implications, and Solutions in Telecoupling Land Use Change Research	Friis, Cecilie; Nielsen, Jonas Ostergaard	Sustainability	2017	9	6	Framework
38	Transatlantic wood pellet trade demonstrates telecoupled benefits	Parish, Esther S; Herzberger, Anna J; Phifer, Colin C; Dale, Virginia H	Ecology And Society	2018	23	1	Framework
39	Even at the uttermost ends of the Earth: how seabirds telecouple the Beagle Channel with regional and global processes that affect environmental conservation and social-ecological sustainability	Raya Rey, Andrea N.; Cristobal Pizarro, J.; Anderson, Christopher B.; Huettmann, Falk	Ecology And Society	2017	22	4	Framework
40	Property Rights and the Soybean Revolution: Shaping How China and Brazil Are Telecoupled	Torres, Sara M.; Moran, Emilio F.; Bicudo da Silva, Ramon Felipe	Sustainability	2017	9	6	Framework
41	A conceptual framework for analyzing deltas as coupled social-ecological systems: an example from the Amazon River Delta	Brondizio, Eduardo S.; Vogt, Nathan D.; Mansur, Andressa V.; Anthony, Edward J.; Costa, Sandra; Hetrick, Scott	Sustainability Science	2016	11	4	Framework
42	Peruvian anchoveta as a telecoupled fisheries system	Carlson, Andrew K.; Taylor, William W.; Liu, Jianguo; Orlic, Ivan	Ecology And Society	2018	23	1	Framework
43	Biodiversity conservation in a telecoupled world	Carrasco, L. Roman; Chan, Joleen; McGrath, Francesca L.; Nghiem, Le T. P.	Ecology And Society	2017	22	3	Framework
44	Integration across a metacoupled world	Liu, Jianguo	Ecology And Society	2017	22	4	Framework
45	Metacoupling supply and demand for soil conservation service	Zhao, Wenwu; Liu, Yue; Daryanto, Stefani; Fu, Bojie; Liu, Yanxu	Current Opinion In Environmental Sustainability	2018	33	NA	Framework
46	Measuring telecouplings in the global land system: A review and comparative evaluation of land footprint accounting methods	Bruckner, Martin; Fischer, Guenther; Tramberend, Sylvia; Giljum, Stefan	Ecological Economics	2015	114	NA	Framework
47	Analysis of energy-based metabolic efficiency and environmental pressure on the local coupling and telecoupling between urbanization and the eco-environment in the Beijing-Tianjin-Hebei urban agglomeration	Fang ChuangLin; Ren Yufei	Science China-Earth Sciences	2017	60	6	Framework
48	The role of bioclimatic features, landscape configuration and historical land use in the invasion of an Asian tree in subtropical Argentina	Montti, Lia; Piriz Carrillo, Vernica; Gutierrez-Angonese, Jorgelina; Ignacio Gasparri, N.; Aragon, Roxana; Ricardo Grau, H.	Landscape Ecology	2017	32	11	Framework
49	Trade: A Driver of Present and Future Ecosystems	Pace, Michael L.; Gephart, Jessica A.	Ecosystems	2017	20	1	Framework

50	Coupled human and natural systems approach to wildlife research and conservation	Carter, Neil H.; Vina, Andres; Hull, Vanessa; McConnell, William J.; Axinn, William; Ghimire, Dirgha; Liu, Jianguo	Ecology And Society	2014	19	3	Framework
51	Living With Locusts: Connecting Soil Nitrogen, Locust Outbreaks, Livelihoods, and Livestock Markets	Cease, Arianne J.; Elser, James J.; Fenichel, Eli R.; Hadrich, Joleen C.; Harrison, Jon F.; Robinson, Brian E.	Bioscience	2015	65	6	Framework
52	Telecoupling framework for research on migratory species in the Anthropocene	Hulina, Jacqueline; Bocetti, Carol; Campa, Henry, III; Hull, Vanessa; Yang, Wu; Liu, Jianguo	Elementa-Science Of The Anthropocene	2017	5	NA	Framework
53	Architecture of the global land acquisition system: applying the tools of network science to identify key vulnerabilities	Seaquist, J. W.; Johansson, Emma Li; Nicholas, Kimberly A.	Environmental Research Letters	2014	9	11	Framework
54	The Telecoupling Framework: An Integrative Tool for Enhancing Fisheries Management	Carlson, Andrew K.; Taylor, William W.; Liu, Jianguo; Orlic, Ivan	Fisheries	2017	42	8	Framework
55	Energy sustainability under the framework of telecoupling	Fang, Baling; Tan, Yi; Li, Canbing; Cao, Yijia; Liu, Jianguo; Schweizer, Pia-Johanna; Shi, Haiqing; Zhou, Bin; Chen, Hao; Hu, Zhuangli	Energy	2016	106	NA	Framework
56	Telecoupled land-use changes in distant countries	Sun, Jing; Tong Yu-xin; Liu, Jianguo	Journal Of Integrative Agriculture	2017	16	2	Framework
57	Polycentric governance in telecoupled resource systems	Oberlack, Christoph; Boillat, Sébastien; Brönnimann, Stefan; Gerber, Jean-david; Heinimann, Andreas; Speranza, Chinwe Ifejika; Messerli, Peter; Rist, Stephan	Ecology And Society	2018	23	1	Framework
58	How Land Concessions Affect Places Elsewhere: Telecoupling, Political Ecology, and Large-Scale Plantations in Southern Laos and Northeastern Cambodia	Baird, Ian G.; Fox, Jefferson	Land	2015	4	2	Framework
59	Land-use change in a telecoupled world: the relevance and applicability of the telecoupling framework in the case of banana plantation expansion in Laos	Friis, Cecilie; Nielsen, Jonas Ostergaard	Ecology And Society	2017	22	4	Framework
60	The Emerging Soybean Production Frontier in Southern Africa: Conservation Challenges and the Role of South-South Telecouplings	Ignacio Gasparri, Nestor; Kuemmerle, Tobias; Meyfroidt, Patrick; le Polain de Waroux, Yann; Kreft, Holger	Conservation Letters	2016	9	1	Framework
61	Framing ecosystem services in the telecoupled Anthropocene	Liu, Jianguo; Yang, Wu; Li, Shuxin	Frontiers In Ecology And The Environment	2016	14	1	Framework
62	Smallholder telecoupling and potential sustainability	Zimmerer, Karl S.; Lambin, Eric F.; Vanek, Steven J.	Ecology And Society	2018	23	1	Framework
63	Telecoupling, urbanization, and the unintended consequences of water development aid in Ethiopia	Chignell, Stephen M; Laituri, Melinda J.	Geological Society Of America Special Papers	2016	520	NA	Framework

64	Climate change, cattle, and the challenge of sustainability in a telecoupled system in Africa	Easter, Tara S.; Killion, Alexander K.; Carter, Neil H.	Ecology And Society	2018	23	1	Framework
65	The Coupling of South American Soybean and Cattle Production Frontiers: New Challenges for Conservation Policy and Land Change Science	Ignacio Gasparri, Nestor; de Waroux, Yann le Polain	Conservation Letters	2015	8	4	Framework
66	Applications of the Telecoupling Framework to Land-Change Science	Liu, Jianguo; Hull, Vanessa; Moran, Emilio; Nagendra, Harini; Swaffield, Simon R.; Turner, B. L., II	Rethinking Global Land Use In An Urban Era	2014	NA	NA	Framework
67	Transforming governance in telecoupled food systems	Eakin, Hallie; Rueda, Ximena; Mahanti, Ashwina	Ecology And Society	2017	22	4	Framework
68	Globalization's unexpected impact on soybean production in South America: linkages between preferences for non-genetically modified crops, eco-certifications, and land use	Garrett, Rachael D.; Rueda, Ximena; Lambin, Eric F.	Environmental Research Letters	2013	8	4	Framework
69	Operationalizing the telecoupling framework for migratory species using the spatial subsidies approach to examine ecosystem services provided by Mexican free-tailed bats	Lopez-Hoffman, Laura; Diffendorfer, Jay; Wiederholt, Ruscena; Bagstad, Kenneth J.; Thogmartin, Wayne E.; McCracken, Gary; Medellin, Rodrigo L.; Russell, Amy; Semmens, Darius J.	Ecology And Society	2017	22	4	Framework
70	Telecouplings in the East-West Economic Corridor within Borders and Across	Leisz, Stephen J.; Rounds, Eric; Ngo The An; Nguyen Thi Bich Yen; Tran Nguyen Bang; Douangphachanh, Souvanthone; Ninchaleune, Bounheuang	Remote Sensing	2016	8	12	Framework
71	Framing Sustainability in a Telecoupled World	Liu, Jianguo; Hull, Vanessa; Batistella, Mateus; DeFries, Ruth; Dietz, Thomas; Fu, Feng; Hertel, Thomas W.; Izaurrealde, R. Cesar; Lambin, Eric F.; Li, Shuxin; Martinelli, Luiz A.; McConnell, William J.; Moran, Emilio F.; Naylor, Rosamond; Ouyang, Zhiyun; Polenske, Karen R.; Reenberg, Anette; Rocha, Gilberto de Miranda; Simmons, Cynthia S.; Verburg, Peter H.; Vitousek, Peter M.; Zhang, Fusuo; Zhu, Chunquan	Ecology And Society	2013	18	2	Framework
72	Impact of Inter-Basin Water Transfer Projects on Regional Ecological Security from a Telecoupling Perspective	Quan, Yuan; Wang, Chenxing; Yan, Yan; Wu, Gang; Zhang, Hongxun	Sustainability	2016	8	2	Framework
73	Forest Sustainability in China and Implications for a Telecoupled World	Liu, Jianguo	Asia & The Pacific Policy Studies	2014	1	1	Framework
74	Assessing temporal couplings in social-ecological island systems: historical deforestation and soil loss on Mauritius (Indian Ocean)	Norder, S. J.; Seijmonsbergen, A. C.; Rughooputh, Soonil D. D. V.; van Loon, E. E.; Tatayah, V.; Kamminga, A. T.; Rijdsdijk, K. F.	Ecology And Society	2017	22	1	Framework

75	Ecosystem service flows from a migratory species: Spatial subsidies of the northern pintail.	Bagstad, Kenneth J; Semmens, Darius J; Diffendorfer, James E; Mattsson, Brady J; Dubovsky, James; Thogmartin, Wayne E; Wiederholt, Ruscena; Loomis, John; Bieri, Joanna A; Sample, Christine; Goldstein, Joshua; Lopez-Hoffman, Laura	Ambio	2018	NA	NA	Framework
76	Measuring the potential for sustainable intensification of aquaculture in Bangladesh using life cycle assessment	Henriksson, Patrik John Gustav; Belton, Ben; Murshed-e-Jahan, Khondker; Rico, Andreu	Proceedings Of The National Academy Of Sciences Of The United States Of America	2018	115	12	Framework
77	Telecoupling in urban water systems: an examination of Beijing's imported water supply	Deines, Jillian M.; Liu, Xiao; Liu, Jianguo	Water International	2016	41	2	Framework
78	Multiple telecouplings and their complex interrelationships	Liu, Jianguo; Hull, Vanessa; Luo, Junyan; Yang, Wu; Liu, Wei; Vina, Andres; Vogt, Christine; Xu, Zhenci; Yang, Hongbo; Zhang, Jindong; An, Li; Chen, Xiaodong; Li, Shuxin; Ouyang, Zhiyun; Xu, Weihua; Zhang, Hemin	Ecology And Society	2015	20	3	Framework
79	Spillover systems in a telecoupled Anthropocene: Typology, methods, and governance for global sustainability	Liu, Jianguo; Dou, Yue; Batistella, Mateus; Challies, Edward; Connor, Thomas; Friis, Cecilie; Millington, James D.A.; Parish, Esther; Romulo, Chelsie; Silva, Ramon Felipe Bicudo da; Triezenberg, Heather; Yang, Hongbo; Zhao, Zhiqiang; Zimmerer, Karl; Huettmann, Falk; Treglia, Michael L.; Basher, Zeenatul; Chung, Min Gon; Herzberger, Anna; Lenschow, Andrea; Mechiche-Alami, Altaaf; Newig, Jens; Roche, James; Sun, Jing	Current Opinion In Environmental Sustainability	2018	33	NA	Framework
80	Systems integration for global sustainability	Liu, Jianguo; Mooney, Harold; Hull, Vanessa; Davis, Steven J.; Gaskell, Joanne; Hertel, Thomas; Lubchenco, Jane; Seto, Karen C.; Gleick, Peter; Kremen, Claire; Li, Shuxin	Science	2015	347	6225	Framework
81	Integrated assessments of payments for ecosystem services programs	Liu, Jianguo; Yang, Wu	Proceedings Of The National Academy Of Sciences Of The United States Of America	2013	110	41	Framework
82	Uncovering the spatially distant feedback loops of global trade: A network and input-output approach	Prell, Christina; Sun, Laixiang; Feng, Kuishuang; He, Jiaying; Hubacek, Ilaus	Science Of The Total Environment	2017	586	NA	Framework

83	Importing food damages domestic environment: Evidence from global soybean trade	Sun, Jing; Mooney, Harold; Wu, Wenbin; Tang, Huajun; Tong, Yuxin; Xu, Zhenci; Huang, Baorong; Cheng, Yeqing; Yang, Xinjun; Wei, Dan; Zhang, Fusuo; Liu, Jianguo	Proceedings Of The National Academy Of Sciences Of The United States Of America	2018	115	21	Framework
84	Telecoupling Toolbox: spatially explicit tools for studying telecoupled human and natural systems	Tonini, Francesco; Liu, Jianguo	Ecology And Society	2017	22	4	Framework
85	Trade in the telecoupling framework: Evidence from the metals industry	Xiong, Hang; Millington, James D A; Xu, Wei	Ecology And Society	2018	23	1	Framework
86	New road for telecoupling global prosperity and ecological sustainability	Yang, Dewei; Cai, Jingjing; Hull, Vanessa; Wang, Kaiyong; Tsang, Yin-Phan; Liu, Jianguo	Ecosystem Health And Sustainability	2016	2	10	Framework
87	Economic drivers of telecoupling and terrestrial carbon fluxes in the global soybean complex	Yao, Guolin; Hertel, Thomas; Taheripour, Farzad	Global Environmental Change	2018	50	NA	Framework
88	Feedback of telecoupling: the case of a payments for ecosystem services program	Yang, Hongbo; Lupi, Frank; Zhang, Jindong; Chen, Xiaodong; Liu, Jianguo	Ecology And Society	2018	23	2	Framework
89	Urban water sustainability: framework and application	Yang, Wu; Hyndman, David W.; Winkler, Julie A.; Vina, Andres; Deines, Jillian M.; Lupi, Frank; Luo, Lifeng; Li, Yunkai; Basso, Bruno; Zheng, Chunmiao; Ma, Dongchun; Li, Shuxin; Liu, Xiao; Zheng, Hua; Cao, Guoliang; Meng, Qingyi; Ouyang, Zhiyun; Liu, Jianguo	Ecology And Society	2016	21	4	Framework