

Supplementary Materials for

**Towards a cohesive understanding of ecological complexity**

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Table S1

Figures S1 – S4

Table S1.

List of review studies retrieved by the search on the Web of Science using the word “Complexity” in the “Ecology” and “Environmental Sciences” categories. The original search retrieved 23,703 manuscripts published between 2000 and 2021 (search conducted on July 14th, 2021), from which 71 were review studies.

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| **Authors** | **Article Title** | **Source Title** | **Publication Year** | **DOI** |
| Kappeler, PM | A framework for studying social complexity | BEHAVIORAL ECOLOGY AND SOCIOBIOLOGY | 2019 | 10.1007/s00265-018-2601-8 |
| Merow, C; Smith, MJ; Edwards, TC; Guisan, A; McMahon, SM; Normand, S; Thuiller, W; Wuest, RO; Zimmermann, NE; Elith, J | What do we gain from simplicity versus complexity in species distribution models? | ECOGRAPHY | 2014 | 10.1111/ecog.00845 |
| Chaplin-Kramer, R; O'Rourke, ME; Blitzer, EJ; Kremen, C | A meta-analysis of crop pest and natural enemy response to landscape complexity | ECOLOGY LETTERS | 2011 | 10.1111/j.1461-0248.2011.01642.x |
| Donohue, I; Hillebrand, H; Montoya, JM; Petchey, OL; Pimm, SL; Fowler, MS; Healy, K; Jackson, AL; Lurgi, M; McClean, D; O'Connor, NE; O'Gorman, EJ; Yang, Q | Navigating the complexity of ecological stability | ECOLOGY LETTERS | 2016 | 10.1111/ele.12648 |
| He, P; Maldonado-Chaparro, AA; Farine, DR | The role of habitat configuration in shaping social structure: a gap in studies of animal social complexity | BEHAVIORAL ECOLOGY AND SOCIOBIOLOGY | 2019 | 10.1007/s00265-018-2602-7 |
| Tuck, SL; Winqvist, C; Mota, F; Ahnstrom, J; Turnbull, LA; Bengtsson, J | Land-use intensity and the effects of organic farming on biodiversity: a hierarchical meta-analysis | JOURNAL OF APPLIED ECOLOGY | 2014 | 10.1111/1365-2664.12219 |
| Arnosti, C; Wietz, M; Brinkhoff, T; Hehemann, JH; Probandt, D; Zeugner, L; Amann, R | The Biogeochemistry of Marine Polysaccharides: Sources, Inventories, and Bacterial Drivers of the Carbohydrate Cycle | ANNUAL REVIEW OF MARINE SCIENCE, VOL 13, 2021 | 2021 | 10.1146/annurev-marine-032020-012810 |
| Parrish, B; Heptonstall, P; Gross, R; Sovacool, BK | A systematic review of motivations, enablers and barriers for consumer engagement with residential demand response | ENERGY POLICY | 2020 | 10.1016/j.enpol.2019.111221 |
| Vila, M; Espinar, JL; Hejda, M; Hulme, PE; Jarosik, V; Maron, JL; Pergl, J; Schaffner, U; Sun, Y; Pysek, P | Ecological impacts of invasive alien plants: a meta-analysis of their effects on species, communities and ecosystems | ECOLOGY LETTERS | 2011 | 10.1111/j.1461-0248.2011.01628.x |
| Sheriff, MJ; Peacor, SD; Hawlena, D; Thaker, M | Non-consumptive predator effects on prey population size: A dearth of evidence | JOURNAL OF ANIMAL ECOLOGY | 2020 | 10.1111/1365-2656.13213 |
| Casewell, NR; Wuster, W; Vonk, FJ; Harrison, RA; Fry, BG | Complex cocktails: the evolutionary novelty of venoms | TRENDS IN ECOLOGY & EVOLUTION | 2013 | 10.1016/j.tree.2012.10.020 |
| Brack, W; Ait-Aissa, S; Burgess, RM; Busch, W; Creusot, N; Di Paolo, C; Escher, BI; Hewitt, LM; Hilscherova, K; Hollender, J; Hollert, H; Jonker, W; Kool, J; Lamoree, M; Muschket, M; Neumann, S; Rostkowski, P; Ruttkies, C; Schollee, J; Schymanski, EL; Schulze, T; Seiler, TB; Tindall, AJ; Umbuzeiro, GD; Vrana, B; Krauss, M | Effect-directed analysis supporting monitoring of aquatic environments - An in-depth overview | SCIENCE OF THE TOTAL ENVIRONMENT | 2016 | 10.1016/j.scitotenv.2015.11.102 |
| Sterner, T; Barbier, EB; Bateman, I; van den Bijgaart, I; Crepin, AS; Edenhofer, O; Fischer, C; Habla, W; Hassler, J; Johansson-Stenman, O; Lange, A; Polasky, S; Rockstrom, J; Smith, HG; Steffen, W; Wagner, G; Wilen, JE; Alpiza, F; Azar, C; Carless, D; Chavez, C; Corial, J; Engstrom, G; Jagers, SC; Kohlin, G; Lofgren, A; Pleijel, H; Robinson, A | Policy design for the Anthropocene | NATURE SUSTAINABILITY | 2019 | 10.1038/s41893-018-0194-x |
| Carmona, CP; de Bello, F; Mason, NWH; Leps, J | Traits Without Borders: Integrating Functional Diversity Across Scales | TRENDS IN ECOLOGY & EVOLUTION | 2016 | 10.1016/j.tree.2016.02.003 |
| Sundqvist, MK; Sanders, NJ; Wardle, DA | Community and Ecosystem Responses to Elevational Gradients: Processes, Mechanisms, and Insights for Global Change | ANNUAL REVIEW OF ECOLOGY, EVOLUTION, AND SYSTEMATICS, VOL 44 | 2013 | 10.1146/annurev-ecolsys-110512-135750 |
| Symonds, MRE; Moussalli, A | A brief guide to model selection, multimodel inference and model averaging in behavioural ecology using Akaike's information criterion | BEHAVIORAL ECOLOGY AND SOCIOBIOLOGY | 2011 | 10.1007/s00265-010-1037-6 |
| Fino, D; Bensaid, S; Piumetti, M; Russo, N | A review on the catalytic combustion of soot in Diesel particulate filters for automotive applications: From powder catalysts to structured reactors | APPLIED CATALYSIS A-GENERAL | 2016 | 10.1016/j.apcata.2015.10.016 |
| Kim, KH; Kabir, E; Jahan, SA | Airborne bioaerosols and their impact on human health | JOURNAL OF ENVIRONMENTAL SCIENCES | 2018 | 10.1016/j.jes.2017.08.027 |
| Qiu, RJ; Lin, M; Qin, BJ; Xu, ZM; Ruan, JJ | Environmental-friendly recovery of non-metallic resources from waste printed circuit boards: A review | JOURNAL OF CLEANER PRODUCTION | 2021 | 10.1016/j.jclepro.2020.123738 |
| Swanson, ME; Franklin, JF; Beschta, RL; Crisafulli, CM; DellaSala, DA; Hutto, RL; Lindenmayer, DB; Swanson, FJ | The forgotten stage of forest succession: early-successional ecosystems on forest sites | FRONTIERS IN ECOLOGY AND THE ENVIRONMENT | 2011 | 10.1890/090157 |
| Orr, JA; Vinebrooke, RD; Jackson, MC; Kroeker, KJ; Kordas, RL; Mantyka-Pringle, C; Van den Brink, PJ; De Laender, F; Stoks, R; Holmstrup, M; Matthaei, CD; Monk, WA; Penk, MR; Leuzinger, S; Schafer, RB; Piggott, JJ | Towards a unified study of multiple stressors: divisions and common goals across research disciplines | PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES | 2020 | 10.1098/rspb.2020.0421 |
| 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, ES; Xu, CG; Xu, XT; Zhang, T; Moorcroft, PR | Vegetation demographics in Earth System Models: A review of progress and priorities | GLOBAL CHANGE BIOLOGY | 2018 | 10.1111/gcb.13910 |
| Belzer, C; de Vos, WM | Microbes inside-from diversity to function: the case of Akkermansia | ISME JOURNAL | 2012 | 10.1038/ismej.2012.6 |
| Bandeira, M; Giovanela, M; Roesch-Ely, M; Devine, DM; Crespo, JD | Green synthesis of zinc oxide nanoparticles: A review of the synthesis methodology and mechanism of formation | SUSTAINABLE CHEMISTRY AND PHARMACY | 2020 | 10.1016/j.scp.2020.100223 |
| Mesoudi, A; Thornton, A | What is cumulative cultural evolution? | PROCEEDINGS OF THE ROYAL SOCIETY B-BIOLOGICAL SCIENCES | 2018 | 10.1098/rspb.2018.0712 |
| Hardesty, BD; Harari, J; Isobe, A; Lebreton, L; Maximenko, N; Potemra, J; van Sebille, E; Vethaak, AD; Wilcox, C | Using Numerical Model Simulations to Improve the Understanding of Micro-plastic Distribution and Pathways in the Marine Environment | FRONTIERS IN MARINE SCIENCE | 2017 | 10.3389/fmars.2017.00030 |
| Wohl, E; Lane, SN; Wilcox, AC | The science and practice of river restoration | WATER RESOURCES RESEARCH | 2015 | 10.1002/2014WR016874 |
| Ahmad, M; Rajapaksha, AU; Lim, JE; Zhang, M; Bolan, N; Mohan, D; Vithanage, M; Lee, SS; Ok, YS | Biochar as a sorbent for contaminant management in soil and water: A review | CHEMOSPHERE | 2014 | 10.1016/j.chemosphere.2013.10.071 |
| Engler, RE | The Complex Interaction between Marine Debris and Toxic Chemicals in the Ocean | ENVIRONMENTAL SCIENCE & TECHNOLOGY | 2012 | 10.1021/es3027105 |
| Kim, KH; Kabir, E; Jahan, SA | Exposure to pesticides and the associated human health effects | SCIENCE OF THE TOTAL ENVIRONMENT | 2017 | 10.1016/j.scitotenv.2016.09.009 |
| Prakash, V; Singh, VP; Tripathi, DK; Sharma, S; Corpas, FJ | Crosstalk between nitric oxide (NO) and abscisic acid (ABA) signalling molecules in higher plants | ENVIRONMENTAL AND EXPERIMENTAL BOTANY | 2019 | 10.1016/j.envexpbot.2018.10.033 |
| Baleta, J; Mikulcic, H; Klemes, JJ; Urbaniec, K; Duic, N | Integration of energy, water and environmental systems for a sustainable development | JOURNAL OF CLEANER PRODUCTION | 2019 | 10.1016/j.jclepro.2019.01.035 |
| Yu, XW; Manthiram, A | Electrode-electrolyte interfaces in lithium-based batteries | ENERGY & ENVIRONMENTAL SCIENCE | 2018 | 10.1039/c7ee02555f |
| Giovannoni, SJ; Thrash, JC; Temperton, B | Implications of streamlining theory for microbial ecology | ISME JOURNAL | 2014 | 10.1038/ismej.2014.60 |
| Nayak, A; Bhushan, B | An overview of the recent trends on the waste valorization techniques for food wastes | JOURNAL OF ENVIRONMENTAL MANAGEMENT | 2019 | 10.1016/j.jenvman.2018.12.041 |
| Notarnicola, B; Sala, S; Anton, A; McLaren, SJ; Saouter, E; Sonesson, U | The role of life cycle assessment in supporting sustainable agri-food systems: A review of the challenges | JOURNAL OF CLEANER PRODUCTION | 2017 | 10.1016/j.jclepro.2016.06.071 |
| Siddique, MNI; Ab Wahid, Z | Achievements and perspectives of anaerobic co-digestion: A review | JOURNAL OF CLEANER PRODUCTION | 2018 | 10.1016/j.jclepro.2018.05.155 |
| Kelly, JR; Scheibling, RE | Fatty acids as dietary tracers in benthic food webs | MARINE ECOLOGY PROGRESS SERIES | 2012 | 10.3354/meps09559 |
| Mahmood, A; Wang, JL | Machine learning for high performance organic solar cells: current scenario and future prospects | ENERGY & ENVIRONMENTAL SCIENCE | 2021 | 10.1039/d0ee02838j |
| Asbjornsen, H; Goldsmith, GR; Alvarado-Barrientos, MS; Rebel, K; Van Osch, FP; Rietkerk, M; Chen, JQ; Gotsch, S; Tobon, C; Geissert, DR; Gomez-Tagle, A; Vache, K; Dawson, TE | Ecohydrological advances and applications in plant-water relations research: a review | JOURNAL OF PLANT ECOLOGY | 2011 | 10.1093/jpe/rtr005 |
| Campanale, C; Massarelli, C; Savino, I; Locaputo, V; Uricchio, VF | A Detailed Review Study on Potential Effects of Microplastics and Additives of Concern on Human Health | INTERNATIONAL JOURNAL OF ENVIRONMENTAL RESEARCH AND PUBLIC HEALTH | 2020 | 10.3390/ijerph17041212 |
| Lai, CS; Locatelli, G; Pimm, A; Wu, XM; Lai, LL | A review on long-term electrical power system modeling with energy storage | JOURNAL OF CLEANER PRODUCTION | 2021 | 10.1016/j.jclepro.2020.124298 |
| Jiang, Y; Zevenbergen, C; Ma, YC | Urban pluvial flooding and stormwater management: A contemporary review of China's challenges and sponge cities strategy | ENVIRONMENTAL SCIENCE & POLICY | 2018 | 10.1016/j.envsci.2017.11.016 |
| Lead, JR; Batley, GE; Alvarez, PJJ; Croteau, MN; Handy, RD; McLaughlin, MJ; Judy, JD; Schirmer, K | Nanomaterials in the environment: Behavior, fate, bioavailability, and effectsAn updated review | ENVIRONMENTAL TOXICOLOGY AND CHEMISTRY | 2018 | 10.1002/etc.4147 |
| Martin, TG; Burgman, MA; Fidler, F; Kuhnert, PM; Low-Choy, S; Mcbride, M; Mengersen, K | Eliciting Expert Knowledge in Conservation Science | CONSERVATION BIOLOGY | 2012 | 10.1111/j.1523-1739.2011.01806.x |
| Torralba, M; Fagerholm, N; Burgess, PJ; Moreno, G; Plieninger, T | Do European agroforestry systems enhance biodiversity and ecosystem services? A meta-analysis | AGRICULTURE ECOSYSTEMS & ENVIRONMENT | 2016 | 10.1016/j.agee.2016.06.002 |
| Samways, MJ; Barton, PS; Birkhofer, K; Chichorro, F; Deacon, C; Fartmann, T; Fukushima, CS; Gaigher, R; Habel, JC; Hallmann, CA; Hill, MJ; Hochkirch, A; Kaila, L; Kwak, ML; Maes, D; Mammola, S; Noriega, JA; Orfinger, AB; Pedraza, F; Pryke, JS; Roque, FO; Settele, J; Simaika, JP; Stork, NE; Suhling, F; Vorster, C; Cardoso, P | Solutions for humanity on how to conserve insects | BIOLOGICAL CONSERVATION | 2020 | 10.1016/j.biocon.2020.108427 |
| Filbee-Dexter, K; Scheibling, RE | Sea urchin barrens as alternative stable states of collapsed kelp ecosystems | MARINE ECOLOGY PROGRESS SERIES | 2014 | 10.3354/meps10573 |
| Sifakis, S; Androutsopoulos, VP; Tsatsakis, AM; Sparididos, DA | Human exposure to endocrine disrupting chemicals: effects on the male and female reproductive systems | ENVIRONMENTAL TOXICOLOGY AND PHARMACOLOGY | 2017 | 10.1016/j.etap.2017.02.024 |
| Dong, LJ; Tong, XJ; Li, XB; Zhou, J; Wang, SF; Liu, B | Some developments and new insights of environmental problems and deep mining strategy for cleaner production in mines | JOURNAL OF CLEANER PRODUCTION | 2019 | 10.1016/j.jclepro.2018.10.291 |
| Ramanujam, J; Singh, UP | Copper indium gallium selenide based solar cells - a review | ENERGY & ENVIRONMENTAL SCIENCE | 2017 | 10.1039/c7ee00826k |
| Manaia, CM; Rocha, J; Scaccia, N; Marano, R; Radu, E; Biancullo, F; Cerqueira, F; Fortunato, G; Iakovides, IC; Zammit, I; Kampouris, I; Vaz-Moreira, I; Nunes, OC | Antibiotic resistance in wastewater treatment plants: Tackling the black box | ENVIRONMENT INTERNATIONAL | 2018 | 10.1016/j.envint.2018.03.044 |
| Kumar, SG; Rao, KSRK | Physics and chemistry of CdTe/CdS thin film heterojunction photovoltaic devices: fundamental and critical aspects | ENERGY & ENVIRONMENTAL SCIENCE | 2014 | 10.1039/c3ee41981a |
| Paul-Pont, I; Tallec, K; Gonzalez-Fernandez, C; Lambert, C; Vincent, D; Mazurais, D; Zambonino-Infante, JL; Brotons, G; Lagarde, F; Fabioux, C; Soudant, P; Huvet, A | Constraints and Priorities for Conducting Experimental Exposures of Marine Organisms to Microplastics | FRONTIERS IN MARINE SCIENCE | 2018 | 10.3389/fmars.2018.00252 |
| Thomas, N; Dionysiou, DD; Pillai, SC | Heterogeneous Fenton catalysts: A review of recent advances | JOURNAL OF HAZARDOUS MATERIALS | 2021 | 10.1016/j.jhazmat.2020.124082 |
| Conti, C; Guarino, M; Bacenetti, J | Measurements techniques and models to assess odor annoyance: A review | ENVIRONMENT INTERNATIONAL | 2020 | 10.1016/j.envint.2019.105261 |
| Qin, YX; Li, GY; Gao, YP; Zhang, LZ; Ok, YS; An, TC | Persistent free radicals in carbon-based materials on transformation of refractory organic contaminants (ROCs) in water: A critical review | WATER RESEARCH | 2018 | 10.1016/j.watres.2018.03.012 |
| Wang, HX; Guerrero, A; Bou, A; Al-Mayouf, AM; Bisquert, J | Kinetic and material properties of interfaces governing slow response and long timescale phenomena in perovskite solar cells | ENERGY & ENVIRONMENTAL SCIENCE | 2019 | 10.1039/c9ee00802k |
| Bucci, K; Tulio, M; Rochman, CM | What is known and unknown about the effects of plastic pollution: A meta-analysis and systematic review | ECOLOGICAL APPLICATIONS | 2020 | 10.1002/eap.2044 |
| Agrawal, AA | Current trends in the evolutionary ecology of plant defence | FUNCTIONAL ECOLOGY | 2011 | 10.1111/j.1365-2435.2010.01796.x |
| Krzeminski, P; Tomei, MC; Karaolia, P; Langenhoff, A; Almeida, CMR; Felis, E; Gritten, F; Andersen, HR; Fernandes, T; Manaia, CM; Rizzo, L; Fatta-Kassinos, D | Performance of secondary wastewater treatment methods for the removal of contaminants of emerging concern implicated in crop uptake and antibiotic resistance spread: A review | SCIENCE OF THE TOTAL ENVIRONMENT | 2019 | 10.1016/j.scitotenv.2018.08.130 |
| Pearlman, J; Bushnell, M; Coppola, L; Karstensen, J; Buttigieg, PL; Pearlman, F; Simpsons, P; Barbier, M; Muller-Karger, FE; Munoz-Mas, C; Pissierssens, P; Chandler, C; Hermes, J; Heslop, E; Jenkyns, R; Achterberg, EP; Bensi, M; Bittig, HC; Blandin, J; Bosch, J; Bourles, B; Bozzano, R; Buck, JJH; Burger, EF; Cano, D; Cardin, V; Llorens, MC; Cianca, A; Chen, H; Cusack, C; Delory, E; Garello, R; Giovanetti, G; Harscoat, V; Hartman, S; Heitsenrether, R; Jirka, S; Lara-Lopez, A; Lanteri, N; Leadbetter, A; Manzella, G; Maso, J; McCurdy, A; Moussat, E; Ntoumas, M; Pensieri, S; Petihakis, G; Pinardi, N; Pouliquen, S; Przeslawski, R; Roden, NP; Silke, J; Tamburri, MN; Tang, HR; Tanhua, T; Telszewski, M; Testor, P; Thomas, J; Waldmann, C; Whoriskey, F | Evolving and Sustaining Ocean Best Practices and Standards for the Next Decade | FRONTIERS IN MARINE SCIENCE | 2019 | 10.3389/fmars.2019.00277 |
| Vereecken, H; Schnepf, A; Hopmans, JW; Javaux, M; Or, D; Roose, DOT; Vanderborght, J; Young, MH; Amelung, W; Aitkenhead, M; Allison, SD; Assouline, S; Baveye, P; Berli, M; Bruggemann, N; Finke, P; Flury, M; Gaiser, T; Govers, G; Ghezzehei, T; Hallett, P; Franssen, HJH; Heppell, J; Horn, R; Huisman, JA; Jacques, D; Jonard, F; Kollet, S; Lafolie, F; Lamorski, K; Leitner, D; McBratney, A; Minasny, B; Montzka, C; Nowak, W; Pachepsky, Y; Padarian, J; Romano, N; Roth, K; Rothfuss, Y; Rowe, EC; Schwen, A; Simunek, J; Tiktak, A; Van Dam, J; van der Zee, SEATM; Vogel, HJ; Vrugt, JA; Wohling, T; Young, IM | Modeling Soil Processes: Review, Key Challenges, and New Perspectives | VADOSE ZONE JOURNAL | 2016 | 10.2136/vzj2015.09.0131 |
| Bellwood, DR; Streit, RP; Brandl, SJ; Tebbett, SB | The meaning of the term 'function' in ecology: A coral reef perspective | FUNCTIONAL ECOLOGY | 2019 | 10.1111/1365-2435.13265 |
| Adao, T; Hruska, J; Padua, L; Bessa, J; Peres, E; Morais, R; Sousa, JJ | Hyperspectral Imaging: A Review on UAV-Based Sensors, Data Processing and Applications for Agriculture and Forestry | REMOTE SENSING | 2017 | 10.3390/rs9111110 |
| Keesstra, S; Nunes, JP; Saco, P; Parsons, T; Poeppl, R; Masselink, R; Cerda, A | The way forward: Can connectivity be useful to design better measuring and modelling schemes for water and sediment dynamics? | SCIENCE OF THE TOTAL ENVIRONMENT | 2018 | 10.1016/j.scitotenv.2018.06.342 |
| Heino, J | A macroecological perspective of diversity patterns in the freshwater realm | FRESHWATER BIOLOGY | 2011 | 10.1111/j.1365-2427.2011.02610.x |
| Lenoir, J; Svenning, JC | Climate-related range shifts - a global multidimensional synthesis and new research directions | ECOGRAPHY | 2015 | 10.1111/ecog.00967 |
| Groeneveld, J; Muller, B; Buchmann, CM; Dressler, G; Guo, C; Hase, N; Hoffmann, F; John, F; Klassert, C; Lauf, T; Liebelt, V; Nolzen, H; Pannicke, N; Schulze, J; Weise, H; Schwarz, N | Theoretical foundations of human decision-making in agent-based land use models - A review | ENVIRONMENTAL MODELLING & SOFTWARE | 2017 | 10.1016/j.envsoft.2016.10.008 |
| Guimaraes, N; Padua, L; Marques, P; Silva, N; Peres, E; Sousa, JJ | Forestry Remote Sensing from Unmanned Aerial Vehicles: A Review Focusing on the Data, Processing and Potentialities | REMOTE SENSING | 2020 | 10.3390/rs12061046 |
| Andersen, AN | Responses of ant communities to disturbance: Five principles for understanding the disturbance dynamics of a globally dominant faunal group | JOURNAL OF ANIMAL ECOLOGY | 2019 | 10.1111/1365-2656.12907 |

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**Fig. S1.** **Cumulative production of articles over time.** Cumulative production (from 1970 to 2021) between articles mentioning “complexity” in their titles and abstract considering all the scientific fields (gray line) and separately for the ecology and environmental sciences, as approximated by the search term “ecological complexity” (red line). The number of articles were log-transformed [Log10(x+1)] to ease the comparison between groups.

Calendar

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**Fig. S2.** **Importance of features to characterize *control* group and *complexity* articles.** The table reports the number of times each feature appears in each quantile (Q1–4) considering only the 1% most important terms in each article. The higher total value between groups is highlighted in bold (note that only the feature “Aggregation” appears more in the control group and some features do not appear at all in the *control* group). Graph on the right show the distribution of beta parameters for each feature without subselecting the 1% most important terms. Vertical line represents the average probability across all words.

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**Fig. S3.** **Adjacency matrix for the co-occurrence of features.** The colors in the name of the features indicate whether these are significantly related to *complexity* than the *control* articles based on Indicator Species Analysis. The filling gradient in the matrix represents the weight of the connection estimated as the sum of the edge weights of the adjacent edges of the node.

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**Fig. S4.** **Adjacency matrix for the co-citation of references.** The colors in the name of the reference indicate the five clusters extracted using the Louvaine algorithm. The filling gradient in the matrix represents the number of articles citing the pair of references simultaneously.