

CONTENTS

An empirical study on the dynamic effect of regional industrial carbon transfer in China J. Xu, M. Zhang, M. Zhou and H. Li (Xuzhou, China)	1
Leaf-litter breakdown as an indicator of the impacts by flow regulation in headwater streams: Responses across climatic regions S. Mollá (Madrid, Spain), J.J. Casas (Almería, Spain), M. Menéndez (Barcelona, Spain), A. Basaguren (Bilbao, Spain), C. Casado (Madrid, Spain), E. Descals (Esporles, Spain), J.M. González (Móstoles, Spain), A. Larrañaga (Bilbao, Spain), M. Lusi (Almería, Spain), A. Martínez, C. Mendoza-Lera (Bilbao, Spain), O. Moya (Esporles, Spain), J. Pérez (Bilbao, Spain), T. Riera (Esporles, Spain), N. Roblas (Tres Cantos, Spain) and J. Pozo (Bilbao, Spain)	11
Bundles of ecosystem (dis)services and multifunctionality across European landscapes M.A. Mouchet (Paris, France and Grenoble, France), M.L. Paracchini (Ispra, Italy), C.J.E. Schulp, J. Stürck (Amsterdam, The Netherlands), P.J. Verkerk (Joensuu, Finland), P.H. Verburg (Amsterdam, The Netherlands) and S. Lavorel (Grenoble, France)	23
Examining the impact factors of urban residential energy consumption and CO ₂ emissions in China – Evidence from city-level data L. Miao (Nagoya, Japan).....	29
Enhancing the performance of hazard indexes in assessing hot spots of harbour areas by considering hydrodynamic parameters M. Mali, F. De Serio, M.M. Dell’Anna, P. Mastroilli, L. Damiani and M. Mossa (Bari, Italy).....	38
Developing the methodology for determining the relative weight of dimensions employed in sustainable building assessment tools for Brazil M.T.G. Barbosa (Juiz de Fora, Brazil) and M. Almeida (Guimarães, Portugal).....	46
Validating the NemaSPEAR[%]-index for assessing sediment quality regarding chemical-induced effects on benthic communities in rivers S. Höss (Starnberg, Germany and Bielefeld, Germany), P. Heininger, E. Claus, C. Möhlenkamp, M. Brinke (Koblenz, Germany) and W. Traunspurger (Bielefeld, Germany).....	52
<i>Mus spretus</i> as an environmental sentinel: A review of 17 years (1998–2015) of research in Mediterranean Europe F.M.R. da Silva Júnior, S. Eslava-Martins, A.L. Muccillo-Baisch (Rio Grande, Brazil) and M. da Luz Mathias (Lisboa, Portugal)	61
Modeling changes in land use patterns and ecosystem services to explore a potential solution for meeting the management needs of a heritage site at the landscape level W. You, Z. Ji, L. Wu, X. Deng, D. Huang (Fuzhou, China), B. Chen, J. Yu (Wuyishan, China) and D. He (Fuzhou, China).....	68
Tiny terminological disagreements with far reaching consequences for global bird trends H. Fraser (Parkville, Australia), J.-B. Pichancourt (Queensland, Australia) and A. Butet (Rennes, France).....	79
Application of solid surface fluorescence EEM spectroscopy for tracking organic matter quality of native halophyte and furrow-irrigated soils H. Pan (Zhengzhou, PR China and Beijing, PR China), H. Yu, Y. Song (Beijing, PR China), R. Liu (Beijing, PR China) and E. Du (Shanghai, PR China)	88

(Contents continued on inside back cover)



Metacommunity structure of zooplankton in river networks: Roles of environmental and spatial factors K. Zhao (China), K. Song (China and Ningbo, China), Y. Pan (USA), L. Wang (Ann Arbor, MI, USA), L. Da (China, Ningbo, China and Shanghai, China) and Q. Wang (China)	96
Comparison of object-based and pixel-based Random Forest algorithm for wetland vegetation mapping using high spatial resolution GF-1 and SAR data B. Fu (Changchun, PR China, Beijing, PR China and Kingston, RI, USA), Y. Wang, A. Campbell (Kingston, RI, USA), Y. Li, B. Zhang (Changchun, PR China), S. Yin (Tangshan, PR China), Z. Xing and X. Jin (Changchun, PR China and Beijing, PR China)	105
Plant functional assemblages as indicators of the resilience of grassland ecosystem service provision M. Kohler (Innsbruck, Austria), C. Devaux, K. Grigulis (Grenoble, France), G. Leitinger (Innsbruck, Austria and Bozen/Bolzano, Italy), S. Lavorel (Grenoble, France) and U. Tappeiner (Innsbruck, Austria and Bozen/Bolzano, Italy)	118
Assessment of the resilience of socio-ecological production landscapes and seascapes: A case study from Lefke Region of North Cyprus G.C. Ciftcioglu (Mersin, Turkey)	128
Trade-offs between plant species richness and carbon storage in the context of afforestation – Examples from afforestation scenarios in the Mulde Basin, Germany S. Lautenbach (Leipzig, Germany and Bonn, Germany), A. Jungandreas (Leipzig, Germany), J. Blanke, V. Lehsten (Lund, Sweden), S. Mühlner (Leipzig, Germany), I. Kühn (Halle, Germany and Leipzig, Germany) and M. Volk (Leipzig, Germany)	139
A comparison of cover calculation techniques for relating point-intercept vegetation sampling to remote sensing imagery J.W. Karl, S.E. McCord (Las Cruces, NM, USA) and B.C. Hadley (Denver, CO, USA)	156
Bioindicator species for EROD activity measurements: A review with Australian fish as a case study M.M. Gagnon and C.A. Rawson (Bentley, Australia)	166
Sampling effort and common species: Optimizing surveys of understorey fruit-feeding butterflies in the Central Amazon M.B. Graça, J.L.P. Souza, E. Franklin, J.W. Morais and P.A.C.L. Pequeno (Manaus, Brazil)	181
How does the cumulative impacts approach support Maritime Spatial Planning? M. da Luz Fernandes, T.C. Esteves, E.R. Oliveira and F.L. Alves (Aveiro, Portugal)	189
Equitable and reasonable freshwater allocation based on a multi-criteria decision making approach with hydrologically constrained bankruptcy rules Y. Zeng (Beijing, China and Canada), J. Li (Canada), Y. Gai (Beijing, China and Regina, Canada) and Q. Tan (Beijing, China)	203
Locating spatial variation in the association between road network and forest biomass carbon accumulation X. Hu, L. Zhang, L. Ye, Y. Lin and R. Qiu (Fuzhou, China)	214
Application of surrogate measures of ecological quality assessment: The introduction of the Indicator of Ecological Landscape Quality (IELQ) B. Sowińska-Świerkosz (Lublin, Poland)	224
An ecological network analysis of the structure, development and sustainability of China's natural gas supply system security F. Shaikh (Beijing, China and Jamshoro, Pakistan), Q. Ji and Y. Fan (Beijing, China)	235
Could energy flow in agro-ecosystems be used as a "tool" for crop and farming system replacement? M.C. Michos, G.C. Menexes, K.L. Kalburtji, C.A. Tsatsarelis, C.D. Anagnostopoulos and A.P. Mamolos (Thessaloniki, Greece)	247
A spatial explicit agent based model approach to evaluate the performance of different monitoring options for mortality estimates in the scope of onshore windfarm impact assessments M. Santos, R. Bastos (Vila Real, Portugal), D. Ferreira (Vila Real, Portugal and Guimarães, Portugal), A. Santos (Vila Real, Portugal and Oviedo, Spain), P. Barros, P. Travassos, D. Carvalho, C. Gomes, H.M. Vale-Gonçalves, L. Braz, F. Morinha, M. das Neves Paiva-Cardoso, S.J. Hughes and J.A. Cabral (Vila Real, Portugal)	254
Evaluation of environmentally conscious manufacturing programs using a three-hybrid multi-criteria decision analysis method P. Sen, M. Roy and P. Pal (India)	264
Effects of <i>in situ</i> phosphorus enrichment on the benthos in a subalpine karst stream and implications for bioassessment in nature reserves Y. Pan (Portland, OR, USA), G. Deng (Sichuan, China), L. Wang (Detroit, MI, USA), Y. Cao (USA), W. Pang, Q. Wang, B. Li (Shanghai, China), B. Wang (Nanjing, China), J. Zhang (Nanjing, China) and R. Xu (Sichuan, China)	274
Total-factor ecology efficiency of regions in China S. Yue, Y. Yang and Z. Pu (Nanjing, China)	284
Statistical analysis of the distribution of infralittoral <i>Cystoseira</i> populations on pristine coasts of four Tyrrhenian islands: Proposed adjustment to the CARLIT index G. Jona Lasinio, M.A Tullio, D. Ventura, G. Ardizzone and N. Abdelahad (Italy)	293

(Contents continued from inside back cover)

Selecting focal species as surrogates for imperiled species using relative sensitivities derived from occupancy analysis A.L. Silvano, C. Guyer, T.D. Steury and J.B. Grand (USA)	302
Environmental regulation efficiency and total factor productivity—Effect analysis based on Chinese data from 2003 to 2013 D. Tang, J. Tang, Z. Xiao, T. Ma and B.J. Bethel (Nanjing, China).....	312
Indicator macroinvertebrate species in a temporary Mediterranean river: Recognition of patterns in binary assemblage data with a Kohonen artificial neural network K. Sroczyńska, M. Claro (Faro, Portugal), A. Kruk, A. Wojtal-Frankiewicz (Banacha Str., Poland), P. Range (Doha, Qatar) and L. Chícharo (Faro, Portugal)	319
Soil organic carbon fractions are affected by different land uses in an agro-pastoral transitional zone in Northeastern China P. Yu (Changchun, China and Beijing, China), K. Han (Changchun, China and Urumqi, China), Q. Li and D. Zhou (Changchun, China)	331
The impacts of agricultural payments on groundwater quality: Spatial analysis on the case of Slovenia R. Slabe-Erker, T. Bartolj, M. Ogorevc, D. Kavaš and K. Koman (Ljubljana, Slovenia)	338
Patterns of bird diversity and habitat use in mixed vineyard-matorral landscapes of Central Chile Z.L. Steel, A.E. Steel (Davis, CA, USA), J.N. Williams (Oax, Mexico), J.H. Viers (Merced, CA, USA), P.A. Marquet (Santiago, Chile) and O. Barbosa (Chile and Valdivia, Chile).....	345
Water resources stress assessment and risk early warning—a case of Hebei Province China M. Liu (Beijing, China), J. Wei, G. Wang (Beijing, China and Xining, China) and F. Wang (Beijing, China).....	358
Forest and the city: A multivariate analysis of peri-urban forest land cover patterns in 283 European metropolitan areas L. Salvati, F. Ranalli, M. Carlucci, A. Ippolito (Rome, Italy), A. Ferrara (Potenza, Italy) and P. Corona (Arezzo, Italy)	369
Fusion of airborne LiDAR data and hyperspectral imagery for aboveground and belowground forest biomass estimation S. Luo (Beijing, China and Toronto, Canada), C. Wang, X. Xi (Beijing, China), F. Pan (Denton, TX, USA), D. Peng (Beijing, China), J. Zou (Fuzhou, China), S. Nie and H. Qin (Beijing, China).....	378
Identifying relevant scales of variability for monitoring epifaunal reef communities at a tidal energy extraction site J.P.J. O'Carroll, R.M. Kennedy (Galway, Ireland) and G. Savidge (Portaferry, UK)	388
Fish recolonization of a lowland river with non-buffered storm water discharges but with abated pollution from a large municipality T. Penczak, Ł. Glowacki and A. Kruk (Banacha Str., Poland)	398
Size-structural shifts reveal intensity of exploitation in coral reef fisheries B.J. Zgliczynski and S.A. Sandin (San Diego, CA, USA)	411
Unravelling the correlates of species richness and ecological uniqueness in a metacommunity of urban pond insects J. Heino (Oulu, Finland), L.M. Bini (Goiânia, Brazil), J. Andersson (Uppsala, Sweden), J. Bergsten (Stockholm, Sweden), U. Bjelke and F. Johansson (Uppsala, Sweden).....	422
Response of freshwater macroinvertebrates to rainfall-induced high flows: A hydroecological approach C. Theodoropoulos (Anavyssos, Greece and Athens, Greece), A. Vourka (Anavyssos, Greece), A. Stamou (Athens, Greece), P. Rutschmann (Munich, Germany) and N. Skoulikidis (Anavyssos, Greece).....	432
Validation of a suite of biomarkers of fish health in the tropical bioindicator species, tambaqui (<i>Colossoma macropomum</i>) H. Sadauskas-Henrique (Manaus, Brazil), R.M. Duarte (Manaus, São Vicente, Brazil), M.M. Gagnon (Perth, Australia) and V.M.F. Almeida-Val (Manaus, Brazil).....	443
Modeling the impact of highland settlements on ecological disturbance of streams in Choke Mountain Catchment: Macroinvertebrate assemblages and water quality T. Alemneh (Jimma, Ethiopia and Aalborg, Denmark), A. Ambelu (Jimma, Ethiopia), S. Bahrndorff (Aalborg, Denmark), S.T. Mereta (Jimma, Ethiopia), C. Pertoldi (Aalborg, Denmark) and B.F. Zaitchik (Baltimore, USA)	452
Community mapping of ecosystem services in tropical rainforest of Ecuador Ma.J. Delgado-Aguilar, W. Konold (Freiburg, Germany) and C.B. Schmitt (Freiburg, Germany and Bonn, Germany)	460
Nematode community indices for microhabitat type and large scale landscape properties M.A. Tsiafouli (Thessaloniki, Greece), D.R. Bhusal (Kathmandu, Nepal) and S.P. Sgardelis (Thessaloniki, Greece)	472

Effects of urbanization on stream benthic invertebrate communities in Central Amazon R.T. Martins (Manaus, Brazil), S.R.M. Couceiro (Santarém, Brazil), A.S. Melo (Goiânia, Brazil), M.P. Moreira and N. Hamada (Manaus, Brazil)	480
How to analyse ecosystem services in landscapes—A systematic review O. Englund, G. Berndes and C. Cederberg (Gothenburg, Sweden)	492
Assessing the functional signature of heathland landscapes via hyperspectral remote sensing J. Schmidt, F.E. Fassnacht (Karlsruhe, Germany), A. Lausch (Leipzig, Germany) and S. Schmidlein (Karlsruhe, Germany).....	505
A comprehensive evaluation on industrial & urban symbiosis by combining MFA, carbon footprint and emergy methods—Case of Kawasaki, Japan S. Ohnishi (Noda, Japan), H. Dong, Y. Geng (Shanghai, China), M. Fujii and T. Fujita (Tsukuba, Japan)	513
Short-term response of soil enzyme activities in a chlorpyrifos-treated mesocosm: Use of enzyme-based indexes J.C. Sanchez-Hernandez (Toledo, Spain), M. Sandoval (Chillán, Chile) and A. Pierart (Castanet-Tolosan, France)	525
Variation of functional diversity of soil microbial community in sub-humid tropical rice-rice cropping system under long-term organic and inorganic fertilization U. Kumar, M. Shahid, R. Tripathi, S. Mohanty, A. Kumar, P. Bhattacharyya, B. Lal, P. Gautam (Cuttack, India), R. Raja (Cuttack, India and Coimbatore, India), B.B. Panda, N.N. Jambhulkar (Cuttack, India), A.K. Shukla (Bhopal, India) and A.K. Nayak (Cuttack, India).....	536
Comparative study on biophysical ecosystem service mapping methods—a test case of carbon stocks in Finnish Forest Lapland L. Mononen (Joensuu, Finland), P. Vihervaara (Helsinki, Finland), T. Repo, K.T. Korhonen, A. Ihalainen and T. Kumpula (Joensuu, Finland).....	544
Ecological-economic efficiency evaluation of green technology innovation in strategic emerging industries based on entropy weighted TOPSIS method L.-y. Sun, C.-l. Miao and L. Yang (Huainan City, China).....	554
In situ soil net nitrogen mineralization in coastal salt marshes (<i>Suaeda salsa</i>) with different flooding periods in a Chinese estuary J. Jia, J. Bai, H. Gao, X. Wen, G. Zhang, B. Cui and X. Liu (Beijing, China).....	559
Birds and plants: Comparing biodiversity indicators in eight lowland agricultural mosaic landscapes in Hungary G.G. Nagy, M. Ladányi (Budapest, Hungary), I. Arany, R. Aszalós and B. Czúcz (Vácrátót, Hungary).....	566
Towards benthic ecosystem functioning maps: Quantifying bioturbation potential in the German part of the Baltic Sea M. Gogina, C. Morys, S. Forster (Rostock, Germany), U. Gräwe (Rostock, Germany and Hannover, Germany), R. Friedland and M.L. Zettler (Rostock, Germany).....	574
Environmental sustainability measurement in the Travel & Tourism Competitiveness Index: An empirical analysis of its reliability J.G. Dias (Lisboa, Portugal).....	589
Modeling and measuring urban sustainability in multi-criteria based systems — A challenging issue F. Ali-Toudert and L. Ji (Dortmund, Germany)	597
Using fuzzy analytic hierarchy process for spatio-temporal analysis of eco-environmental vulnerability change during 1990–2010 in Sanjiangyuan region, China D. Liu (Beijing, PR China and Bonn, Germany), C. Cao (Beijing, PR China), O. Dubovyk (Bonn, Germany), R. Tian, W. Chen, Q. Zhuang, Y. Zhao (Beijing, PR China) and G. Menz (Bonn, Germany).....	612
An Ecosystem Health Index for a large and variable river basin: Methodology, challenges and continuous improvement in Queensland's Fitzroy Basin N. Flint, J. Rolfe, C.E. Jones, C. Sellens, N.D. Johnston and L. Ukkola (Rockhampton, Australia)	626
Urban atmospheric environmental capacity and atmospheric environmental carrying capacity constrained by GDP-PM _{2.5} Y. Zhou and J. Zhou (Wuhan, China)	637
Technology gap and CO ₂ emission reduction potential by technical efficiency measures: A meta-frontier modeling for the Chinese agricultural sector R. Fei (Fujian, PR China) and B. Lin (Fujian, PR China).....	653
Bird based Index of Biotic Integrity: Assessing the ecological condition of Atlantic Forest patches in human-modified landscape E.R. Alexandrino (Piracicaba, Brazil), E.R. Buechley (Salt Lake City, UT, USA), J.R. Karr (Seattle, WA, USA), K.M.P.M. de Barros Ferraz, S.F. de Barros Ferraz, H.T.Z. do Couto (Piracicaba, Brazil) and Ç.H. Şekercioğlu (Salt Lake City, UT, USA)	662

Spatial differentiation of marine eutrophication damage indicators based on species density N. Cosme (Lyngby, Denmark), M.C. Jones (Cambridge, UK), W.W.L. Cheung (British Columbia, Canada) and H.F. Larsen (Lyngby, Denmark)	676
A generic aggregation approach to account for statistical uncertainty when combining multiple assessment results W.N. Probst (Hamburg, Germany)	686
Joining science and policy in capacity development for monitoring progress towards the Aichi Biodiversity Targets in the global South M.P.M. Vanhove (Brussels, Belgium, Brno, Czechia, Leuven, Belgium and Diepenbeek, Belgium), A.-J. Rochette and L. Janssens de Bisthoven (Brussels, Belgium)	694
Urbanization effects on different biological organization levels of an estuarine polychaete tolerant to pollution W.A. Weis, C.H.L. Soares, D.P.C. de Quadros, M. Scheneider and P.R. Pagliosa (Florianópolis, Brazil).....	698
Using legumes as indicators in the seasonally dry vegetation types in South America J.R. Lima, N.D. Santos (Seropédica, Brazil), A.M.G.A. Tozzi (Campinas, Brazil) and V.F. Mansano (Rio de Janeiro, Brazil).....	708
Regional sustainability assessment framework for integrated coastal zone management: Satoumi, ecosystem services approach, and inclusive wealth T. Uehara (Osaka, Japan) and K. Mineo (Kyoto, Japan).....	716
BioFTF: An R package for biodiversity assessment with the functional data analysis approach T. Di Battista, F. Fortuna and F. Maturo (Italy)	726
Reproducibility of fluctuating asymmetry measurements in plants: Sources of variation and implications for study design M.V. Kozlov (Turku, Finland), T. Cornelissen (Brazil), D.E. Gavrikov (Irkutsk, Russia), M.A. Kunavin (Arkhangelsk, Russia), A.D. Lama (Turku, Finland), J.R. Milligan (Cleveland, OH, USA), V. Zverev and E.L. Zvereva (Turku, Finland).....	733
Sorting municipalities in Umbria according to the risk of wolf attacks with AHPSort II F. Miccoli and A. Ishizaka (Portsmouth, UK).....	741
Evaluating joint environmental and cost performance in municipal waste management systems through data envelopment analysis: Scale effects and policy implications A. Sarra, M. Mazzocchitti and A. Rapposelli (Pescara, Italy).....	756
Assessment of quality of three marine benthic habitat types in northern Baltic Sea K. Torn, K. Herkül, G. Martin and K. Oganjan (Tallinn, Estonia).....	772
Source apportionment and risk assessment of PAHs in Brisbane River sediment, Australia G.O. Duodu, K.N. Ogogo, S. Mummullage, F. Harden, A. Goonetilleke and G.A. Ayoko (Australia).....	784
EKC and the income elasticity hypothesis Land for housing or land for future? S. Bimonte and e.A. Stabile (Italy)	800
Comparison of thermodynamic-oriented indicators and trait-based indices ability to track environmental changes: Response of benthic macroinvertebrates to management in a temperate estuary H. Veríssimo, T. Verdelhos, A. Baeta, P. van der Linden, A.C. Garcia and J.C. Marques (Coimbra, Portugal).....	809
Optical trait indicators for remote sensing of plant species composition: Predictive power and seasonal variability H. Feilhauer (Erlangen, Germany), B. Somers (Leuven, Belgium) and S. van der Linden (Berlin, Germany).....	825