

# CONTENTS

Modelling carbon isotopes in spruce trees reproduces air quality changes due to oil sands operations M.M. Savard, C. Bégin and J. Marion (Québec, Canada) .....	1
Detecting the impacts of harbour construction on a seagrass habitat and its subsequent recovery G. Roca (Spain and Girona, Spain), J. Romero (Spain), S. Columbu, S. Farina, J.F. Pagès, A. Gera (Girona, Spain), G. Inglis (Christchurch, New Zealand) and T. Alcoverro (Girona, Spain and Mysore, India).....	9
Topographic complexity and the power to detect structural and functional changes in temperate reef fish assemblages: The need for habitat-independent sample sizes M.P. Pais, S. Henriques, M.J. Costa and H.N. Cabral (Lisboa, Portugal) .....	18
The role of phytoplankton diversity metrics in shallow lake and river quality assessment G. Borics, J. Görgényi, I. Grigorszky (Debrecen, Hungary), Z. László-Nagy (Szeged, Hungary), B. Tóthmérész, E. Krasznai and G. Várbíró (Debrecen, Hungary) .....	28
Giant rosette plant morphology as an indicator of recent fire history in Andean páramo grasslands P.M. Ramsay (UK) .....	37
Climate imprints on tree-ring $\delta^{15}\text{N}$ signatures of sessile oak ( <i>Quercus petraea</i> Liebl.) on soils with contrasting water availability W. Härdtle, T. Niemeyer (Lüneburg, Germany), A. Fichtner (Kiel, Germany), Y. Li (Lüneburg, Germany), C. Ries (Luxembourg), A. Schuldt, D. Walmsley and G. von Oheimb (Lüneburg, Germany).....	45
An invertebrate predictive model (NORTI) for streams and rivers: Sensitivity of the model in detecting stress gradients I. Pardo, C. Gómez-Rodríguez, R. Abraín, E. García-Roselló (Vigo, Spain) and T.B. Reynoldson (Nova Scotia, Canada) .....	51
Towards the adoption of an international standard for biomonitoring with lichens—Consistency of assessment performed by experts from six European countries F. Cristofolini (San Michele all'Adige, Italy), G. Brunialti (Monterotondo Marittimo, Italy), P. Giordani (Genova, Italy), J. Nascimbene (Trieste, Italy), A. Cristofori, E. Gottardini (San Michele all'Adige, Italy), L. Frati (Monterotondo Marittimo, Italy), P. Matos (Lisboa, Portugal), F. Batič (Ljubljana, Slovenia), S. Caporale (S. Maria Imbaro (CH), Italy), M.F. Fornasier (Roma, Italy), L. Marmor (Tartu, Estonia), S. Merinero, J. Nuñez Zapata (Madrid, Spain), T. Tõrra (Tartu, Estonia), P. Wolseley (London, UK) and M. Ferretti (Monterotondo Marittimo, Italy) .....	63
Plant tissue nutrients as a descriptor of plant productivity of created mitigation wetlands S.M. Dee and C. Ahn (Fairfax, VA, USA) .....	68
A simplified rapid, low-cost and versatile DNA-based assessment of soil microbial biomass F. Fornasier (Gorizia, Italy), J. Ascher (Innsbruck, Austria and Florence, Italy), M.T. Ceccherini (Florence, Italy), E. Tomat (Gorizia, Italy) and G. Pietramellara (Florence, Italy).....	75
The Goosander as potential indicator of naturalness and biodiversity in submontane river valleys of northern Carpathians Ł. Kajtoch (Krakow, Poland), M. Żmihorski (Warsaw, Poland) and A. Piestrzyńska-Kajtoch (Balice near Krakow, Poland) .....	83
Covering over the cracks in conservation assessments at EU interfaces: A cross-jurisdictional ecoregion scale approach using the Eurasian otter ( <i>Lutra lutra</i> ) N. Reid, M.G. Lundy (Belfast, UK), B. Hayden (Belfast, UK and Helsinki, Finland), T. Waterman, D. Looney (Belfast, UK), D. Lynn, F. Marnell (Dublin 2, Ireland), R.A. McDonald (Cornwall, UK) and W.I. Montgomery (Belfast, UK) .....	93

MT-like proteins: Potential bio-indicators of <i>Chlorella vulgaris</i> for zinc contamination in water environment H. Yang (Xiamen, China and Longyan, China), Z.-Y. Huang, J. Li and Y. Hu (Xiamen, China) . . . . .	103
Ex ante assessment of crop rotations focusing on energy crops using a multi-attribute decision-making method A. Werner, A. Werner (Rostock, Germany), R. Wieland, K.-C. Kersebaum, W. Mirschel, H.-P. Ende (Müncheberg, Germany) and H. Wiggering (Müncheberg, Germany and Potsdam, Germany) . . . . .	110
Diatom communities along pH and hydrological gradients in three montane mires, central China X. Chen (Wuhan, China and Nottingham, UK), Y. Qin (Wuhan, China), M.A. Stevenson (Nottingham, UK) and S. McGowan (Nottingham, UK and Semenyih, Malaysia) . . . . .	123
Approaching a functional measure of vulnerability in marine ecosystems F. Arreguín-Sánchez and T.M. Ruiz-Barreiro (La Paz, Mexico) . . . . .	130
Landscape metrics as indicators of coastal morphology: A multi-scale approach R.M. Chefaoui (Faro, Portugal) . . . . .	139
Development of new indicators to evaluate river fragmentation and flow regulation at large scales: A case study for the Mekong River Basin G. Grill, C. Ouellet Dallaire, E. Fluet Chouinard (Montreal, Canada), N. Sindorf (Washington, DC, USA) and B. Lehner (Montreal, Canada) . . . . .	148
A minimum indicator set for assessing resources quality and environmental impacts at planning level in a representative area of the European Mediterranean Region L. Recatalá and D. Sacristán (Moncada (Valencia), Spain) . . . . .	160
Exploring the relationship between urbanization and the eco-environment—A case study of Beijing-Tianjin-Hebei region S. Wang, H. Ma and Y. Zhao (Beijing, China) . . . . .	171
Spatial prediction of soil organic matter content integrating artificial neural network and ordinary kriging in Tibetan Plateau F. Dai (Chongqing, China and Chengdu, China), Q. Zhou, Z. Lv (Chongqing, China), X. Wang and G. Liu (Chengdu, China) . . . . .	184
Application of neural networks to quantify the utility of indices of biotic integrity for biological monitoring M.W. Beck, B.N. Wilson, B. Vondracek and L.K. Hatch (St. Paul, MN, USA) . . . . .	195
Ecological risk assessment and priority setting for typical toxic pollutants in the water from Beijing-Tianjin-Bohai area using Bayesian matbugs calculator (BMC) W. He, N. Qin, X. Kong, W. Liu, W. Wu, Q. He, C. Yang, Y. Jiang, Q. Wang, B. Yang and F. Xu (Beijing, China) . . . . .	209
Comparative performance of incidence-based estimators of species richness in temperate zone herpetofauna inventories R.I. Băncilă (Bucharest, Romania, Constanța, Romania and Zurich, Switzerland), D. Cogălniceanu (Constanța, Romania), R. Plăiașu (Bucharest, Romania and Constanța, Romania), M. Tudor (Constanța, Romania), C. Cazacu (Bucharest, Romania) and T. Hartel (Bucharest, Romania and Lüeneburg, Germany) . . . . .	219
Impacts and indicators of nitrogen deposition in moorlands: Results from a national pollution gradient study S.J.M. Caporn (Manchester, UK), J.A. Carroll (Manchester, UK and Buxton, UK), N.B. Dise (Manchester, UK and Midlothian, UK) and R.J. Payne (Manchester, UK and Stirling, UK) . . . . .	227
Indicators of the impact of land use changes using large-scale bird surveys: Land abandonment in a Mediterranean region S. Herrando (Barcelona, Spain and Solsona, Spain), M. Anton (Barcelona, Spain), F. Sardà-Palomera, G. Bota (Barcelona, Spain and Solsona, Spain), R.D. Gregory (Bedfordshire, UK) and L. Brotons (Barcelona, Spain, Solsona, Spain and Bellaterra, Spain) . . . . .	235
Stirring the pot. Influence of changes in methodology of the Human Development Index on reporting by the press S. Morse (Surrey, UK) . . . . .	245
A multi-indicator framework for mapping cultural ecosystem services: The case of freshwater recreational fishing A.M. Villamagna, B. Mogollón and P.L. Angermeier (Blacksburg, VA, USA) . . . . .	255
Bird migration and avian influenza: A comparison of hydrogen stable isotopes and satellite tracking methods E.S. Bridge, J.F. Kelly, X. Xiao (Norman, OK, USA), J.Y. Takekawa, N.J. Hill (Vallejo, CA, USA), M. Yamage, E.U. Haque, M.A. Islam (Dhaka, Bangladesh), T. Mundkur (Ede, The Netherlands), K.E. Yavuz (Samsun, Turkey), P. Leader (Yuen Long, Hong Kong, China), C.Y.H. Leung (Hong Kong), B. Smith (Hong Kong, China), K.A. Spragens (Vallejo, CA, USA), K.J. Vandegrift (New York, NY, USA and University Park, PA, USA), P.R. Hosseini (New York, NY, USA), S. Saif, S. Mohsanin, A. Mikolon, A. Islam (Dhaka, Bangladesh), A. George (Kaloor, India), B. Sivananthaperumal (Mumbai, India), P. Daszak (New York, NY, USA) and S.H. Newman (Rome, Italy) . . . . .	266
Sensitivity of structural and functional indicators depends on type and resolution of anthropogenic activities A.G. Yates (London, Canada), R.B. Brua (Saskatoon, Canada), J.M. Culp (Fredericton, Canada), P.A. Chambers (Burlington, Canada) and L.I. Wassenaar (Saskatoon, Canada) . . . . .	274
Ecosystem services assessment tool for agroforestry (ESAT-A): An approach to assess selected ecosystem services provided by alley cropping systems P. Tsonkova, A. Quinkenstein, C. Böhm, D. Freese and E. Schaller (Cottbus, Germany) . . . . .	285
Eruption patterns of permanent front teeth as an indicator of performance in roe deer M. Garel (Gières, France and Bar-le-Duc, France), J.-M. Gaillard (Villeurbanne, France), D. Delorme and G.V. Laere (Bar-le-Duc, France) . . . . .	300

Is there a significant relationship between the benthic status of an area, determined by two broadly-used indices, and best professional judgment? Á. Borja (Pasaia, Spain), S. Marín, R. Núñez (Puerto Montt, Chile) and I. Muxika (Pasaia, Spain) .....	308
Trend monitoring of the areal extent of habitats in a subsiding coastal area by spatial probability sampling D.J. Brus, P.A. Slim, A.H. Heidema and H.F. van Dobben (Wageningen, The Netherlands).....	313
A vegetation-based indicator to assess the pollination value of field margin flora C. Ricou, C. Schneller (Colmar, France and Vandoeuvre, France), B. Amiaud (Nancy, France), S. Plantureux and C. Bockstaller (Colmar, France and Vandoeuvre, France).....	320
Spatially non-stationary response of ecosystem service value changes to urbanization in Shanghai, China S. Su, D. Li, Y. Hu, R. Xiao (Wuhan, China) and Y. Zhang (Shanghai, China).....	332
Classification of watersheds into integrated social and biophysical indicators with clustering analysis A. Mayer, R. Winkler (Houghton, MI, USA) and L. Fry (Ann Arbor, MI, USA).....	340
The evaluation of the air pollution index in Turkey A.Ç. Köne and T. Büke (Muğla, Turkey).....	350
Acceptable nutrient concentrations in agriculturally dominant landscapes: A comparison of nutrient criteria approaches for Nebraska rivers and streams T. Heatherly II (Lincoln, NE, USA).....	355
A new index to sort estuarine sediments according to their contaminant content A. Gredilla, S. Fdez-Ortiz de Vallejuelo, A. de Diego, G. Arana and J.M. Madariaga (Bilbao, Spain).....	364
Mapping cultural ecosystem services: A framework to assess the potential for outdoor recreation across the EU M.L. Paracchini, G. Zulian (Ispra, Italy), L. Kopperoinen (Helsinki, Finland), J. Maes, J.P. Schägner (Ispra, Italy), M. Termansen, M. Zandersen (Roskilde, Denmark), M. Perez-Soba (Wageningen, The Netherlands), P.A. Scholefield (Lancaster, UK) and G. Bidoglio (Ispra, Italy) .....	371
Effects of agricultural land use on stream assemblages: Taxon-specific responses of alpha and beta diversity R.K. Johnson and D.G. Angeler (Uppsala, Sweden) .....	386
Are deformation rates of anuran developmental stages suitable indicators for environmental pollution? Possibilities and limitations N. Wagner (Trier, Germany), W. Züghart (Bonn, Germany), V. Mingo and S. Lötters (Trier, Germany).....	394
Using ecological footprint analysis in higher education: Campus operations, policy development and educational purposes W. Lambrechts and L. Van Liedekerke (Belgium) .....	402
The applicability of macrophyte compositional metrics for assessing eutrophication in European lakes A. Kolada (Warsaw, Poland), N. Willby (Stirling, UK), B. Dudley (Penicuik, UK), P. Nöges (Rannu, Estonia), M. Søndergaard (Silkeborg, Denmark), S. Hellsten (Oulu, Finland), M. Mjelde (Oslo, Norway), E. Penning (MH Delft, The Netherlands), G. van Geest (Oslo, Norway), V. Bertrin (France), F. Ecke (Uppsala, Sweden), H. Mäemets and K. Karus (Rannu, Estonia).....	407
Biological indicators to assess short-term soil quality changes in forest ecosystems A. Muscolo, M.R. Panuccio, C. Mallamaci and M. Sidari (Reggio Calabria, Italy).....	416
How many metrics are required to identify the effects of the landscape pattern on land surface temperature? A. Chen, L. Yao, R. Sun and L. Chen (Beijing, China).....	424
Estimating the cost of different strategies for measuring farmland biodiversity: Evidence from a Europe-wide field evaluation S. Targetti (Italy), F. Herzog (Zurich, Switzerland), I.R. Geijzendorffer (Aix-en-Provence, France and The Netherlands), S. Wolfrum (Germany), M. Arndorfer (Austria), K. Balázs (Hungary), J.P. Choisis (France), P. Dennis (UK), S. Eiter, W. Fjellstad (Norway), J.K. Friedel (Austria), P. Jeanneret (Zurich, Switzerland), R.H.G. Jongman (The Netherlands), M. Kainz (Germany), G. Luescher (Zurich, Switzerland), G. Moreno (Spain), T. Zanetti (Padova, Italy), J.P. Sarthou (Castanet-Tolosan, France), S. Stoyanova (Bulgaria), D. Wiley (Zurich, Switzerland), M.G. Paoletti (Padova, Italy) and D. Viaggi (Italy).....	434
Forest cover dynamics analysis and prediction modeling using logistic regression model R. Kumar, S. Nandy, R. Agarwal and S.P.S. Kushwaha (Dehradun, India).....	444
Responses of Mediterranean aquatic and riparian communities to human pressures at different spatial scales D. Bruno (Murcia, Spain), O. Belmar (Aix-en-Provence, France), D. Sánchez-Fernández (Barcelona, Spain), S. Guareschi, A. Millán and J. Velasco (Murcia, Spain).....	456
Variation in photosynthetic activity of phytoplankton during the spring algal blooms in the adjacent area of Changjiang River estuary Z. Wang, J. Wang and L. Tan (Qingdao, PR China).....	465
Methodological developments in US state-level Genuine Progress Indicators: Toward GPI 2.0 K.J. Bagstad (Denver, CO, USA), G. Berik (Salt Lake City, UT, USA) and E.J.B. Gaddis (Salt Lake City, USA)	474
Can NDVI response indicate the effective flood extent in macrophyte dominated floodplain wetlands? S.J. Powell, A. Jakeman and B. Croke (Australia) .....	486

The method matters: A guide for indicator aggregation in ecological assessments S.D. Langhans, P. Reichert and N. Schuwirth (Dübendorf, Switzerland).....	494
Cotton-strip decomposition rate as a river condition indicator – Diel temperature range and deployment season and length also matter V. Vyšná, F. Dyer, W. Maher and R. Norris (Bruce, Australia).....	508
Near infrared reflectance spectroscopy (NIRS) for predicting glucocorticoid metabolites in lyophilised and oven-dried faeces of red deer J.P.V. Santos (Aveiro, Portugal and Ciudad Real, Spain), J. Vicente (Ciudad Real, Spain), M. Villamuelas, E. Albanell (Bellaterra, Barcelona, Spain), E. Serrano (Aveiro, Portugal and Bellaterra, Barcelona, Spain), J. Carvalho (Aveiro, Portugal), C. Fonseca (Aveiro, Portugal and Nampula, Mozambique), C. Gortázar (Ciudad Real, Spain) and J.R. López-Olvera (Bellaterra, Barcelona, Spain).....	522
Too much data is never enough: A review of the mismatch between scales of water quality data collection and reporting from recent marine dredging programmes L.J. Falkenberg and C.A. Styan (Adelaide, Australia).....	529
Ecosystem-based indicators as a tool for mussel culture management strategies A. Pérez-Camacho (A Coruña, Spain), E. Aguiar (Vigo, Spain), U. Labarta, V. Vinseiro, M <sup>a</sup> . J. Fernández-Reiriz and X.A. Álvarez-Salgado (Vigo, Spain) .....	538
Early warning signals of regime shifts from cross-scale connectivity of land-cover patterns G. Zurlini (Lecce, Italy), K.B. Jones (Las Vegas, NV, USA), K.H. Riitters (Research Triangle Park, NC, USA), B.-L. Li (Riverside, CA, USA) and I. Petrosillo (Lecce, Italy) .....	549
Typology of diatom communities in the Dutch delta: Recognizing patterns of environmental drivers in nutrient rich ditches A. Goldenberg Vilar (Amsterdam, The Netherlands), H. van Dam (Amsterdam, The Netherlands and Edam, The Netherlands), J.A. Vonk, H.G. van der Geest and W. Admiraal (Amsterdam, The Netherlands).....	561
Interpretation of high-resolution imagery for detecting vegetation cover composition change after fuels reduction treatments in woodlands J.W. Karl, J.K. Gillan (Las Cruces, NM, USA), N.N. Barger (Boulder, CO, USA), J.E. Herrick (Las Cruces, NM, USA) and M.C. Duniway (Moab, UT, USA) .....	570
Non-point source pollution dynamics under long-term agricultural development and relationship with landscape dynamics W. Ouyang, K. Song, X. Wang and F. Hao (Beijing, China) .....	579
Sustainability assessment of biomass resource utilization based on production of entropy – Case study of a bioethanol concept K. Samiei (Leoben, Austria) and M. Fröling (Östersund, Sweden) .....	590
Effects of flow regulation on the establishment of alien fish species: A community structure approach to biological validation of environmental flows N. Caiola, C. Ibáñez (Sant Carles de la Ràpita, Spain), J. Verdú and A. Munné (Barcelona, Spain) .....	598
Bioaccumulation capacity of two chemical varieties of the lichen <i>Pseudevernia furfuracea</i> P. Malaspina, P. Giordani, P. Modenesi, M.L. Abelmoschi, E. Magi and F. Soggia (Genoa, Italy).....	605
Traffic-induced noise levels in residential urban structures using landscape metrics as indicators N. Weber, D. Haase (Berlin, Germany) and U. Franck (Leipzig, Germany) .....	611
Economic growth, electricity consumption, urbanization and environmental degradation relationship in United Arab Emirates M. Shahbaz (Lahore, Pakistan), R. Sbia (Brussels, Belgium), H. Hamdi (Manama, Bahrain) and I. Ozturk (Mersin, Turkey) .....	622
Genotoxicity evaluation of the insecticide imidacloprid on circulating blood cells of Montevideo tree frog <i>Hypsiboas pulchellus</i> tadpoles (Anura, Hylidae) by comet and micronucleus bioassays C. Ruiz de Arcaute, J.M. Pérez-Iglesias, N. Nikoloff, G.S. Natale, S. Soloneski and M.L. Larramendy (La Plata, Argentina and Argentina) .....	632
Lead isotopic composition in tree leaves as tracers of lead in an urban environment I.V. Deljanin (Belgrade, Serbia), M.N. Tomašević, M.P.A. Urošević (Zemun, Serbia), D.Z. Antanasijević, A.A. Perić-Grujić and M.Đ. Ristić (Belgrade, Serbia).....	640
Re: M. Song, Y. Guan, “The environmental efficiency of Wanjiang demonstration area: A Bayesian estimation approach” [Ecol. Indic. 36 (2014) 59–67] J.J. Sherman (Toledo, OH, USA), A.M. Maran (Bowling Green, OH, USA), C.D. Collier (Toledo, OH, USA), M.R. Snyder, P.C. Golnick (Toledo, OH, USA and Oregon, OH, USA) and S.S. Qian (Toledo, OH, USA) .....	648
Macroinvertebrate indicators of ecological status in Mediterranean temporary stream types of the Balearic Islands L. García, I. Pardo and C. Delgado (Vigo, Spain) .....	650

A conceptual framework for integrated analysis of environmental quality and quality of life E. Banzhaf (Leipzig, Germany), F. de la Barrera (El Comendador, Chile), A. Kindler (Leipzig, Germany), S. Reyes-Paecke (Macul, Chile), U. Schlink, J. Welz and S. Kabisch (Leipzig, Germany) .....	664
Trace metals of needles and litter in timberline forests in the Eastern of Tibetan Plateau, China R. Tang (Chengdu, China and Beijing, China), J. Luo (Chengdu, China), P. Yang (Shaanxi, China), J. She, Y. Chen (Chengdu, China and Beijing, China), Y. Gong and J. Zhou (Chengdu, China) .....	669
Environmental sustainability indicators for cash-crop farms in Quebec, Canada: A participatory approach M.-N. Thivierge, D. Parent, V. Bélanger, D.A. Angers, G. Allard, D. Pellerin and A. Vanasse (Québec, Canada) .....	677
Past biodiversity: Historical Japanese illustrations document the distribution of whales and their epibiotic barnacles R. Hayashi (Chiba, Japan) .....	687
Land management implications for ecosystem services in a South African rangeland K. Petz (Bilthoven, The Netherlands), J. Glenday (Santa Barbara, CA, USA and Patensie, South Africa) and R. Alkemade (Bilthoven, The Netherlands and Wageningen, The Netherlands) .....	692
Indicators of the impacts of habitat loss on connectivity and related conservation priorities: Do they change when habitat patches are defined at different scales? S. Blazquez-Cabrera (Madrid, Spain), Ö. Bodin (Stockholm, Sweden) and S. Saura (Madrid, Spain) .....	704
<i>Trentepohlia umbrina</i> on Scots pine as a bioindicator of alkaline dust pollution L. Marmor and P. Degtjarenko (Tartu, Estonia) .....	717
Pairwise measures of species co-occurrence for choosing indicator species and quantifying overlap T.M. Neeson (Madison, WI, USA) and Y. Mandelik (Rehovot, Israel) .....	721