Patrick M Reed

List of Publications by Year
in descending order

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149 papers	9,540 citations	31949 53 h-index	39638 94 g-index
168 all docs	168 docs citations	168 times ranked	6074 citing authors

#	Article	IF	Citations
1	Borg: An Auto-Adaptive Many-Objective Evolutionary Computing Framework. Evolutionary Computation, 2013, 21, 231-259.	2.3	556
2	State of the Art for Genetic Algorithms and Beyond in Water Resources Planning and Management. Journal of Water Resources Planning and Management - ASCE, 2010, 136, 412-432.	1.3	490
3	Evolutionary algorithms and other metaheuristics in water resources: Current status, research challenges and future directions. Environmental Modelling and Software, 2014, 62, 271-299.	1.9	477
4	Evolutionary multiobjective optimization in water resources: The past, present, and future. Advances in Water Resources, 2013, 51, 438-456.	1.7	406
5	Many objective robust decision making for complex environmental systems undergoing change. Environmental Modelling and Software, 2013, 42, 55-71.	1.9	356
6	How Should Robustness Be Defined for Water Systems Planning under Change?. Journal of Water Resources Planning and Management - ASCE, 2015, 141, .	1.3	253
7	The future of water resources systems analysis: Toward a scientific framework for sustainable water management. Water Resources Research, 2015, 51, 6110-6124.	1.7	214
8	Diagnostic Assessment of Search Controls and Failure Modes in Many-Objective Evolutionary Optimization. Evolutionary Computation, 2012, 20, 423-452.	2.3	185
9	The foodâ€energyâ€water nexus: Transforming science for society. Water Resources Research, 2017, 53, 3550-3556.	1.7	180
10	Sensitivity-guided reduction of parametric dimensionality for multi-objective calibration of watershed models. Advances in Water Resources, 2009, 32, 1154-1169.	1.7	175
11	Evaluating the economic impact of water scarcity in a changing world. Nature Communications, 2021, 12, 1915.	5.8	174
12	Beyond optimality: Multistakeholder robustness tradeoffs for regional water portfolio planning under deep uncertainty. Water Resources Research, 2014, 50, 7692-7713.	1.7	170
13	Curses, Tradeoffs, and Scalable Management: Advancing Evolutionary Multiobjective Direct Policy Search to Improve Water Reservoir Operations. Journal of Water Resources Planning and Management - ASCE, 2016, 142, .	1.3	168
14	Striking the Balance: Long-Term Groundwater Monitoring Design for Conflicting Objectives. Journal of Water Resources Planning and Management - ASCE, 2004, 130, 140-149.	1.3	163
15	Characterization of watershed model behavior across a hydroclimatic gradient. Water Resources Research, 2008, 44, .	1.7	158
16	Cost-effective long-term groundwater monitoring design using a genetic algorithm and global mass interpolation. Water Resources Research, 2000, 36, 3731-3741.	1.7	155
17	Designing a competent simple genetic algorithm for search and optimization. Water Resources Research, 2000, 36, 3757-3761.	1.7	154
18	A framework for Visually Interactive Decision-making and Design using Evolutionary Multi-objective Optimization (VIDEO). Environmental Modelling and Software, 2007, 22, 1691-1704.	1.9	147

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19	Technical Note: Method of Morris effectively reduces the computational demands of global sensitivity analysis for distributed watershed models. Hydrology and Earth System Sciences, 2013, 17, 2893-2903.	1.9	142
20	Reducing uncertainty in predictions in ungauged basins by combining hydrologic indices regionalization and multiobjective optimization. Water Resources Research, 2008, 44, .	1.7	137
21	Managing population and drought risks using manyâ€objective water portfolio planning under uncertainty. Water Resources Research, 2009, 45, .	1.7	133
22	Optimal Design of Water Distribution Systems Using Many-Objective Visual Analytics. Journal of Water Resources Planning and Management - ASCE, 2013, 139, 624-633.	1.3	131
23	Manyâ€objective reservoir policy identification and refinement to reduce policy inertia and myopia in water management. Water Resources Research, 2014, 50, 3355-3377.	1.7	130
24	When are multiobjective calibration tradeâ€offs in hydrologic models meaningful?. Water Resources Research, 2012, 48, .	1.7	121
25	Many-objective de Novo water supply portfolio planning under deep uncertainty. Environmental Modelling and Software, 2012, 34, 87-104.	1.9	120
26	Developing predictive insight into changing water systems: use-inspired hydrologic science for the Anthropocene. Hydrology and Earth System Sciences, 2013, 17, 5013-5039.	1.9	119
27	Manyâ€objective groundwater monitoring network design using biasâ€aware ensemble Kalman filtering, evolutionary optimization, and visual analytics. Water Resources Research, 2011, 47, .	1.7	118
28	Timeâ€varying sensitivity analysis clarifies the effects of watershed model formulation on model behavior. Water Resources Research, 2013, 49, 1400-1414.	1.7	115
29	An open source framework for many-objective robust decision making. Environmental Modelling and Software, 2015, 74, 114-129.	1.9	114
30	A diagnostic assessment of evolutionary algorithms for multi-objective surface water reservoir control. Advances in Water Resources, 2016, 92, 172-185.	1.7	105
31	Simplifying multiobjective optimization: An automated design methodology for the nondominated sorted genetic algorithm-II. Water Resources Research, 2003, 39, .	1.7	102
32	Many objective visual analytics: rethinking the design of complex engineered systems. Structural and Multidisciplinary Optimization, 2013, 48, 201-219.	1.7	98
33	Many-objective optimization and visual analytics reveal key trade-offs for Londonâ€™s water supply. Journal of Hydrology, 2015, 531, 1040-1053.	2.3	95
34	Battle of the Water Networks II. Journal of Water Resources Planning and Management - ASCE, 2014, 140, .	1.3	92
35	Rival framings: A framework for discovering how problem formulation uncertainties shape risk management tradeâ€offs in water resources systems. Water Resources Research, 2017, 53, 7208-7233.	1.7	90
36	Navigating financial and supply reliability tradeoffs in regional drought management portfolios. Water Resources Research, 2014, 50, 4906-4923.	1.7	87

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37	Cooperative drought adaptation: Integrating infrastructure development, conservation, and water transfers into adaptive policy pathways. Water Resources Research, 2016, 52, 7327-7346.	1.7	84
38	Reducing the Complexity of Multiobjective Water Distribution System Optimization through Global Sensitivity Analysis. Journal of Water Resources Planning and Management - ASCE, 2012, 138, 196-207.	1.3	82
39	A multiobjective approach to cost effective long-term groundwater monitoring using an elitist nondominated sorted genetic algorithm with historical data. Journal of Hydroinformatics, 2001, 3, 71-89.	1.1	79
40	A top-down framework for watershed model evaluation and selection under uncertainty. Environmental Modelling and Software, 2009, 24, 901-916.	1.9	79
41	Exploring How Changing Monsoonal Dynamics and Human Pressures Challenge Multireservoir Management for Flood Protection, Hydropower Production, and Agricultural Water Supply. Water Resources Research, 2018, 54, 4638-4662.	1.7	77
42	Water quality trading with asymmetric information, uncertainty and transaction costs: A stochastic agent-based simulation. Resources and Energy Economics, 2013, 35, 60-90.	1.1	75
43	Synthetic Drought Scenario Generation to Support Bottom-Up Water Supply Vulnerability Assessments. Journal of Water Resources Planning and Management - ASCE, 2016, 142, .	1.3	70
44	Many-objective robust decision making for managing an ecosystem with a deeply uncertain threshold response. Ecology and Society, 2015, 20, .	1.0	68
45	Multiobjective sensitivity analysis to understand the information content in streamflow observations for distributed watershed modeling. Water Resources Research, 2009, 45, .	1.7	65
46	Balancing exploration, uncertainty and computational demands in many objective reservoir optimization. Advances in Water Resources, 2017, 109, 196-210.	1.7	65
47	Reducing regional drought vulnerabilities and multi-city robustness conflicts using many-objective optimization under deep uncertainty. Advances in Water Resources, 2017, 104, 195-209.	1.7	63
48	Large-scale parallelization of the Borg multiobjective evolutionary algorithm to enhance the management of complex environmental systems. Environmental Modelling and Software, 2015, 69, 353-369.	1.9	62
49	Direct policy search for robust multi-objective management of deeply uncertain socio-ecological tipping points. Environmental Modelling and Software, 2017, 92, 125-141.	1.9	59
50	Identifying parametric controls and dependencies in integrated assessment models using global sensitivity analysis. Environmental Modelling and Software, 2014, 59, 10-29.	1.9	58
51	Rainfall characteristics define the value of streamflow observations for distributed watershed model identification. Geophysical Research Letters, 2008, 35, .	1.5	57
52	Water Resources Management: The Myth, the Wicked, and the Future. Journal of Water Resources Planning and Management - ASCE, 2009, 135, 411-413.	1.3	56
53	Scalable Multiobjective Control for Large-Scale Water Resources Systems Under Uncertainty. IEEE Transactions on Control Systems Technology, 2018, 26, 1492-1499.	3.2	56
54	Balancing Hydropower Development and Ecological Impacts in the Mekong: Tradeoffs for Sambor Mega Dam. Journal of Water Resources Planning and Management - ASCE, 2019, 145, .	1.3	56

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55	Visual analytics clarify the scalability and effectiveness of massively parallel many-objective optimization: A groundwater monitoring design example. Advances in Water Resources, 2013, 56, 1-13.	1.7	54
56	Large Ensemble Analytic Framework for Consequenceâ€Driven Discovery of Climate Change Scenarios. Earth's Future, 2018, 6, 488-504.	2.4	54
57	Structuring and evaluating decision support processes to enhance the robustness of complex humanâ€“natural systems. Environmental Modelling and Software, 2020, 123, 104551.	1.9	53
58	Using interactive archives in evolutionary multiobjective optimization: A case study for long-term groundwater monitoring design. Environmental Modelling and Software, 2007, 22, 683-692.	1.9	51
59	From maps to movies: high-resolution time-varying sensitivity analysis for spatially distributed watershed models. Hydrology and Earth System Sciences, 2013, 17, 5109-5125.	1.9	50
60	A Stateâ€ofâ€theâ€Art Review of Optimal Reservoir Control for Managing Conflicting Demands in a Changing World. Water Resources Research, 2021, 57, e2021WR029927.	1.7	49
61	Spatial Interpolation Methods for Nonstationary Plume Data. Ground Water, 2004, 42, 190-202.	0.7	47
62	Multisector Dynamics: Advancing the Science of Complex Adaptive Humanâ€Earth Systems. Earth's Future, 2022, 10, .	2.4	47
63	The Value of Online Adaptive Search: A Performance Comparison of NSGAII, Îµ-NSGAII and ÎµMOEA. Lecture Notes in Computer Science, 2005, , 386-398.	1.0	46
64	Flood and drought hydrologic monitoring: the role of model parameter uncertainty. Hydrology and Earth System Sciences, 2015, 19, 3239-3251.	1.9	46
65	Deep Uncertainties in Seaâ€Level Rise and Storm Surge Projections: Implications for Coastal Flood Risk Management. Risk Analysis, 2020, 40, 153-168.	1.5	42
66	Robust abatement pathways to tolerable climate futures require immediate global action. Nature Climate Change, 2019, 9, 290-294.	8.1	41
67	What Is Controlling Our Control Rules? Opening the Black Box of Multireservoir Operating Policies Using Timeâ€Varying Sensitivity Analysis. Water Resources Research, 2019, 55, 5962-5984.	1.7	40
68	Identifying Actionable Compromises: Navigating Multiâ€City Robustness Conflicts to Discover CooperativeÂSafe Operating Spaces for RegionalÂWaterÂSupply Portfolios. Water Resources Research, 2019, 55, 9024-9050.	1.7	39
69	Comparative analysis of multiobjective evolutionary algorithms for random and correlated instances of multiobjective d-dimensional knapsack problems. European Journal of Operational Research, 2011, 211, 466-479.	3.5	38
70	Save now, pay later? Multi-period many-objective groundwater monitoring design given systematic model errors and uncertainty. Advances in Water Resources, 2012, 35, 55-68.	1.7	38
71	Battling Arrowâ€™s Paradox to Discover Robust Water Management Alternatives. Journal of Water Resources Planning and Management - ASCE, 2016, 142, .	1.3	34
72	Diagnostic assessment of the borg MOEA for many-objective product family design problems. , 2012, , .		33

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73	Bridging river basin scales and processes to assess human-climate impacts and the terrestrial hydrologic system. Water Resources Research, 2006, 42, .	1.7	32
74	Climate risk management requires explicit representation of societal trade-offs. Climatic Change, 2016, 134, 713-723.	1.7	32
75	Confronting tipping points: Can multi-objective evolutionary algorithms discover pollution control tradeoffs given environmental thresholds?. Environmental Modelling and Software, 2015, 73, 27-43.	1.9	30
76	Discovering Dependencies, Tradeâ€Offs, and Robustness in Joint Dam Design and Operation: An Exâ€Post Assessment of the Kariba Dam. Earth's Future, 2019, 7, 1367-1390.	2.4	30
77	Can Exploratory Modeling of Water Scarcity Vulnerabilities and Robustness Be Scenario Neutral?. Earth's Future, 2020, 8, e2020EF001650.	2.4	30
78	Defining Robustness, Vulnerabilities, and Consequential Scenarios for Diverse Stakeholder Interests in Institutionally Complex River Basins. Earth's Future, 2020, 8, e2020EF001503.	2.4	30
79	Low cost satellite constellations for nearly continuous global coverage. Nature Communications, 2020, 11, 200.	5.8	29
80	An open source model for quantifying risks in bulk electric power systems from spatially and temporally correlated hydrometeorological processes. Environmental Modelling and Software, 2020, 126, 104667.	1.9	29
81	Multi-Objective Design Optimization for Product Platform and Product Family Design Using Genetic Algorithms. , 2005, , 999.		27
82	Water pathways: An open source stochastic simulation system for integrated water supply portfolio management and infrastructure investment planning. Environmental Modelling and Software, 2020, 132, 104772.	1.9	24
83	Evolving manyâ€objective water management to exploit exascale computing. Water Resources Research, 2014, 50, 8367-8373.	1.7	23
84	Can modern multi-objective evolutionary algorithms discover high-dimensional financial risk portfolio tradeoffs for snow-dominated water-energy systems?. Advances in Water Resources, 2020, 145, 103718.	1.7	22
85	Compound hydrometeorological extremes across multiple timescales drive volatility in California electricity market prices and emissions. Applied Energy, 2020, 276, 115541.	5.1	21
86	Accounting for Adaptive Water Supply Management When Quantifying Climate and Land Cover Change Vulnerability. Water Resources Research, 2020, 56, e2019WR025614.	1.7	20
87	Unintended consequences of climate change mitigation for African river basins. Nature Climate Change, 2022, 12, 187-192.	8.1	19
88	Advances in the identification and evaluation of complex environmental systems models. Journal of Hydroinformatics, 2009, 11, 266-281.	1.1	18
89	Many-objective reconfiguration of operational satellite constellations with the Large-Cluster Epsilon Non-dominated Sorting Genetic Algorithm-II. , 2009, , .		17
90	Operational constraints and hydrologic variability limit hydropower in supporting wind integration. Environmental Research Letters, 2013, 8, 024037.	2.2	17

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91	Internationally coordinated multi-mission planning is now critical to sustain the space-based rainfall observations needed for managing floods globally. Environmental Research Letters, 2015, 10, 024010.	2.2	17
92	Planned relocation: Pluralistic and integrated science and governance. Science, 2021, 372, 1276-1279.	6.0	17
93	California's food-energy-water system: An open source simulation model of adaptive surface and groundwater management in the Central Valley. Environmental Modelling and Software, 2021, 141, 105052.	1.9	17
94	Rhodium: Python Library for Many-Objective Robust Decision Making and Exploratory Modeling. Journal of Open Research Software, 2020, 8, 12.	2.7	16
95	Inaction and climate stabilization uncertainties lead to severe economic risks. Climatic Change, 2014, 127, 463-474.	1.7	15
96	Early systems change necessary for catalyzing long-term sustainability in a post-2030 agenda. One Earth, 2022, 5, 792-811.	3.6	15
97	Addressing model bias and uncertainty in three dimensional groundwater transport forecasts for a physical aquifer experiment. Geophysical Research Letters, 2008, 35, .	1.5	14
98	Parallel Evolutionary Multi-Objective Optimization on Large, Heterogeneous Clusters: An Applications Perspective. Journal of Aerospace Computing, Information, and Communication, 2008, 5, 460-478.	0.8	14
99	An open source reservoir and sediment simulation framework for identifying and evaluating siting, design, and operation alternatives. Environmental Modelling and Software, 2021, 136, 104947.	1.9	13
100	Coordination and control â€“ limits in standard representations of multi-reservoir operations in hydrological modeling. Hydrology and Earth System Sciences, 2021, 25, 1365-1388.	1.9	13
101	Diagnosing the Time-Varying Value of Forecasts in Multiobjective Reservoir Control. Journal of Water Resources Planning and Management - ASCE, 2021, 147, .	1.3	13
102	GROUNDWATER MONITORING DESIGN: A CASE STUDY COMBINING EPSILON DOMINANCE ARCHIVING AND AUTOMATIC PARAMETERIZATION FOR THE NSGA-II. Advances in Natural Computation, 2004, , 79-100.	0.1	13
103	Water rights shape crop yield and revenue volatility tradeoffs for adaptation in snow dependent systems. Nature Communications, 2020, 11, 3473.	5.8	12
104	Designing With Information Feedbacks: Forecast Informed Reservoir Sizing and Operation. Water Resources Research, 2021, 57, e2020WR028112.	1.7	12
105	Improving the Robustness of Reservoir Operations with Stochastic Dynamic Programming. Journal of Water Resources Planning and Management - ASCE, 2021, 147, .	1.3	12
106	Many-Objective Evolutionary Optimisation and Visual Analytics for Product Family Design. , 2011, , 137-159.		12
107	Genetic Algorithms (GAs) and Evolutionary Strategy to Optimize Electronic Nose Sensor Selection. Transactions of the ASABE, 2007, 51, 321-330.	1.1	11
108	Integrating Raw Water Transfers into an Eastern United States Management Context. Journal of Water Resources Planning and Management - ASCE, 2018, 144, 05018012.	1.3	11

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109	Advancing Diagnostic Model Evaluation to Better Understand Water Shortage Mechanisms in Institutionally Complex River Basins. Water Resources Research, 2020, 56, e2020WR028079.	1.7	10
110	Managing Financial Risk Tradeâ€Offs for Hydropower Generation Using Snowpackâ€Based Index Contracts. Water Resources Research, 2020, 56, e2020WR027212.	1.7	10
111	Multiâ€objective optimization of root phenotypes for nutrient capture using evolutionary algorithms. Plant Journal, 2022, 111, 38-53.	2.8	9
112	Diagnostic Framework for Evaluating How Parametric Uncertainty Influences Agroâ€Hydrologic Model Projections of Crop Yields Under Climate Change. Water Resources Research, 2022, 58, .	1.7	9
113	A Typology for Characterizing Human Action in MultiSector Dynamics Models. Earth's Future, 2022, 10, .	2.4	9
114	Skill (or lack thereof) of data-model fusion techniques to provide an early warning signal for an approaching tipping point. PLoS ONE, 2018, 13, e0191768.	1.1	8
115	Search Space Representation and Reduction Methods to Enhance Multiobjective Water Supply Monitoring Design. Water Resources Research, 2019, 55, 2257-2278.	1.7	8
116	Bias Correction of Hydrologic Projections Strongly Impacts Inferred Climate Vulnerabilities in Institutionally Complex Water Systems. Journal of Water Resources Planning and Management - ASCE, 2022, 148, .	1.3	8
117	Comparison of Multi-Objective Evolutionary Algorithms for Long-Term Monitoring Design. , 2005, , 1.		7
118	The effects of air pollution sources / sensor array configurations on the likelihood of obtaining accurate source term estimations. Atmospheric Environment, 2021, 246, 117754.	1.9	7
119	Improving Information-Based Coordinated Operations in Interbasin Water Transfer Megaprojects: Case Study in Southern India. Journal of Water Resources Planning and Management - ASCE, 2021, 147, .	1.3	7
120	Power and Pathways: Exploring Robustness, Cooperative Stability, and Power Relationships in Regional Infrastructure Investment and Water Supply Management Portfolio Pathways. Earth's Future, 2022, 10, .	2.4	7
121	Impact of Interâ€Utility Agreements on Cooperative Regional Water Infrastructure Investment and Management Pathways. Water Resources Research, 2022, 58, .	1.7	7
122	Unveiling uncertainties to enhance sustainability transformations in infrastructure decision-making. Current Opinion in Environmental Sustainability, 2022, 55, 101172.	3.1	7
123	Evaluating wind-following and ecosystem services for hydroelectric dams in PJM. Journal of Regulatory Economics, 2012, 41, 139-154.	0.8	6
124	From Stream Flows to Cash Flows: Leveraging Evolutionary Multiâ€Objective Direct Policy Search to Manage Hydrologic Financial Risks. Water Resources Research, 2022, 58, .	1.7	6
125	Resilient California Water Portfolios Require Infrastructure Investment Partnerships That Are Viable for All Partners. Earth's Future, 2022, 10, .	2.4	6
126	The Role of the Systems Community in the National Science Foundationâ€™s Environmental Observatories. Journal of Water Resources Planning and Management - ASCE, 2007, 133, 1-3.	1.3	5

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127	The Mid-Atlantic Watershed Atlas (MAWA): Open access data search & watershed-based community building. Environmental Modelling and Software, 2010, 25, 808-812.	1.9	5
128	Navigating Deeply Uncertain Tradeoffs in Harvested Predator-Prey Systems. Complexity, 2020, 2020, 1-18.	0.9	5
129	Impacts of irrigation efficiency on water-dependent sectors are heavily controlled by region-specific institutions and infrastructures. Journal of Environmental Management, 2021, 300, 113731.	3.8	5
130	Pareto-Hypervolumes for the Reconfiguration of Satellite Constellations. , 2008, , .		4
131	Adaptive mitigation strategies hedge against extreme climate futures. Climatic Change, 2021, 166, 1.	1.7	4
132	Scalability Analysis of the Asynchronous, Master-Slave Borg Multiobjective Evolutionary Algorithm. , 2013, , .		3
133	A Framework for the Discovery of Passive-Control, Minimum Energy Satellite Constellations. , 2014, , .		3
134	A multi-objective paleo-informed reconstruction of western US weather regimes over the past 600 years. Climate Dynamics, 2023, 60, 339-358.	1.7	3
135	A Multiobjective Approach to Long-Term Groundwater Monitoring Design. , 2000, , 1.		2
136	Simplifying the Parameterization of Real-Coded Evolutionary Algorithms. , 2004, , 1.		1
137	Multiobjective Long-Term Groundwater Monitoring Design: The Benefits of Biasing Search Towards Key Tradeoffs. , 2004, , 1.		1
138	Multiobjective Tools and Strategies for Calibrating Integrated Models. , 2005, , 1.		1
139	Computational Scaling Analysis of Multiobjective Evolutionary Algorithms in Long-Term Groundwater Monitoring Applications. , 2006, , 1.		1
140	An Evolving Paradigm for Publication in the Water Resources Management Field. Journal of Contemporary Water Research and Education, 2008, 139, 37-39.	0.7	1
141	Sensitivity Analysis to Improve Water Distribution System Optimisation. , 2011, , .		1
142	Improving the protection of aquatic ecosystems by dynamically constraining reservoir operation via direct policy conditioning. IFAC Postprint Volumes IPPV / International Federation of Automatic Control, 2014, 47, 6252-6257.	0.4	1
143	Many Objective Visual Analytics: In Search of Search-as-a-Service. , 2014, , .		1
144	Parallelization Strategies for Evolutionary Multiobjective Optimization. , 2006, , 1.		0

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145	A Framework for Visually Interactive Decision-Making and Design Using Evolutionary Multiobjective Optimization (VIDEO). , 2007, , .		0
146	Many-Objective Risk-Based Planning within Complex Engineering Systems: An Urban Water Planning Example. , 2011, , .		0
147	Auto-Adaptive Search Capabilities of the New Borg MOEA: A Detailed Comparison on Alternative Product Family Design Problem Formulations. , 2012, , .		0
148	Multi-Objective Evolutionary Algorithmsâ€™ Performance in a Support Role. , 2015, , .		0
149	Thank You to Our 2021 Reviewers. Earth's Future, 2022, 10, .	2.4	0