Peter J Rayner

List of Publications by Year
in descending order

137 papers	15,093 citations	44042 48 h-index	22808 112 g-index
209 all docs	209 docs citations	209 times ranked	11685 citing authors

#	Article	IF	Citations
1	Climateâ€“Carbon Cycle Feedback Analysis: Results from the C4MIP Model Intercomparison. Journal of Climate, 2006, 19, 3337-3353.	1.2	2,647
2	Recent patterns and mechanisms of carbon exchange by terrestrial ecosystems. Nature, 2001, 414, 169-172.	13.7	1,162
3	Towards robust regional estimates of CO2 sources and sinks using atmospheric transport models. Nature, 2002, 415, 626-630.	13.7	1,157
4	The Orbiting Carbon Observatory (OCO) mission. Advances in Space Research, 2004, 34, 700-709.	1.2	596
5	The shared socio-economic pathway (SSP) greenhouse gas concentrations and their extensions to 2500. Geoscientific Model Development, 2020, 13, 3571-3605.	1.3	539
6	The utility of remotely sensed CO2concentration data in surface source inversions. Geophysical Research Letters, 2001, 28, 175-178.	1.5	444
7	Global atmospheric carbon budget: results from an ensemble of atmospheric CO₂ inversions. Biogeosciences, 2013, 10, 6699-6720.	1.3	356
8	Historical greenhouse gas concentrations for climate modelling (CMIP6). Geoscientific Model Development, 2017, 10, 2057-2116.	1.3	350
9	Transcom 3 inversion intercomparison: Model mean results for the estimation of seasonal carbon sources and sinks. Global Biogeochemical Cycles, 2004, 18, n/a-n/a.	1.9	312
10	Contribution of the Orbiting Carbon Observatory to the estimation of CO2sources and sinks: Theoretical study in a variational data assimilation framework. Journal of Geophysical Research, 2007, 112, .	3.3	301
11	Model-data synthesis in terrestrial carbon observation: methods, data requirements and data uncertainty specifications. Global Change Biology, 2005, 11, 378-397.	4.2	283
12	A synthesis of carbon dioxide emissions from fossil-fuel combustion. Biogeosciences, 2012, 9, 1845-1871.	1.3	271
13	Two decades of terrestrial carbon fluxes from a carbon cycle data assimilation system (CCDAS). Global Biogeochemical Cycles, 2005, 19, n/a-n/a.	1.9	261
14	TOWARD A MONITORING AND FORECASTING SYSTEM FOR ATMOSPHERIC COMPOSITION. Bulletin of the American Meteorological Society, 2008, 89, 1147-1164.	1.7	253
15	Reconstructing the recent carbon cycle from atmospheric CO2, delta13C and O2/N2 observations*. Tellus, Series B: Chemical and Physical Meteorology, 1999, 51, 213-232.	0.8	245
16	On aggregation errors in atmospheric transport inversions. Journal of Geophysical Research, 2001, 106, 4703-4715.	3.3	235
17	TransCom 3 CO2 inversion intercomparison: 1. Annual mean control results and sensitivity to transport and prior flux information. Tellus, Series B: Chemical and Physical Meteorology, 2003, 55, 555-579.	0.8	235
18	Current systematic carbon-cycle observations and the need for implementing a policy-relevant carbon observing system. Biogeosciences, 2014, 11, 3547-3602.	1.3	189

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19	Reconstructing the recent carbon cycle from atmospheric CO₂, δ¹³C and O₂/N₂ observations*. Tellus, Series B: Chemical and Physical Meteorology, 2022, 51, 213.	0.8	187
20	Variations in modeled atmospheric transport of carbon dioxide and the consequences for CO2inversions. Global Biogeochemical Cycles, 1996, 10, 783-796.	1.9	155
21	Multiple constraints on regional CO2flux variations over land and oceans. Global Biogeochemical Cycles, 2005, 19, .	1.9	154
22	A new global gridded data set of CO₂ emissions from fossil fuel combustion: Methodology and evaluation. Journal of Geophysical Research, 2010, 115, .	3.3	144
23	Daily CO₂ flux estimates over Europe from continuous atmospheric measurements: 1, inverse methodology. Atmospheric Chemistry and Physics, 2005, 5, 3173-3186.	1.9	139
24	Regional variations in spatial structure of nightlights, population density and fossil-fuel CO2 emissions. Energy Policy, 2010, 38, 4756-4764.	4.2	126
25	A multiyear, global gridded fossil fuel CO₂ emission data product: Evaluation and analysis of results. Journal of Geophysical Research D: Atmospheres, 2014, 119, 10,213.	1.2	121
26	Evaluation of various observing systems for the global monitoring of CO₂ surface fluxes. Atmospheric Chemistry and Physics, 2010, 10, 10503-10520.	1.9	112
27	Assimilating atmospheric data into a terrestrial biosphere model: A case study of the seasonal cycle. Global Biogeochemical Cycles, 2002, 16, 14-1-14-16.	1.9	111
28	Interannual variability of the global carbon cycle (1992â€"2005) inferred by inversion of atmospheric CO₂ and <i>Î´</i>¹³CO₂ measurements. Global Biogeochemical Cycles, 2008, 22, .	1.9	108
29	On the use of ¹⁴CO₂ as a tracer for fossil fuel CO₂: Quantifying uncertainties using an atmospheric transport model. Journal of Geophysical Research, 2009, 114, .	3.3	107
30	TransCom 3 CO₂ inversion intercomparison: 1. Annual mean control results and sensitivity to transport and prior flux information. Tellus, Series B: Chemical and Physical Meteorology, 2022, 55, 555.	0.8	105
31	Three-dimensional transport and concentration of SF6. A model intercomparison study (TransCom 2). Tellus, Series B: Chemical and Physical Meteorology, 1999, 51, 266-297.	0.8	101
32	Using high temporal frequency data for CO₂ inversions. Global Biogeochemical Cycles, 2002, 16, 1-1.	1.9	98
33	Interannual variations in continentalâ€scale net carbon exchange and sensitivity to observing networks estimated from atmospheric CO₂ inversions for the period 1980 to 2005. Global Biogeochemical Cycles, 2008, 22, .	1.9	96
34	Two decades of ocean CO2 sink and variability. Tellus, Series B: Chemical and Physical Meteorology, 2003, 55, 649-656.	0.8	92
35	Mesoscale inversion: first results from the CERES campaign with synthetic data. Atmospheric Chemistry and Physics, 2008, 8, 3459-3471.	1.9	91
36	Global observations of the carbon budget, 2, CO2column from differential absorption of reflected sunlight in the 1.61 Î¼m band of CO2. Journal of Geophysical Research, 2002, 107, ACH 6-1.	3.3	90

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37	Three-dimensional transport and concentration of SF₆ A model intercomparison study (TransCom 2). Tellus, Series B: Chemical and Physical Meteorology, 2022, 51, 266.	0.8	88
38	The BETHY/JSBACH Carbon Cycle Data Assimilation System: experiences and challenges. Journal of Geophysical Research G: Biogeosciences, 2013, 118, 1414-1426.	1.3	86
39	The relationship between tropical CO2fluxes and the El NiÃ±o-Southern Oscillation. Geophysical Research Letters, 1999, 26, 493-496.	1.5	83
40	OptIC project: An intercomparison of optimization techniques for parameter estimation in terrestrial biogeochemical models. Journal of Geophysical Research, 2007, 112, .	3.3	82
41	Structure of the transport uncertainty in mesoscale inversions of CO₂ sources and sinks using ensemble model simulations. Biogeosciences, 2009, 6, 1089-1102.	1.3	82
42	Investigating the usefulness of satellite-derived fluorescence data in inferring gross primary productivity within the carbon cycle data assimilation system. Biogeosciences, 2015, 12, 4067-4084.	1.3	80
43	Carbon flux bias estimation employing Maximum Likelihood Ensemble Filter (MLEF). Journal of Geophysical Research, 2007, 112, .	3.3	78
44	On the impact of transport model errors for the estimation of CO₂ surface fluxes from GOSAT observations. Geophysical Research Letters, 2010, 37, .	1.5	72
45	A new stepwise carbon cycle data assimilation system using multiple data streams to constrain the simulated land surface carbon cycle. Geoscientific Model Development, 2016, 9, 3321-3346.	1.3	67
46	The Potential of the Geostationary Carbon Cycle Observatory (GeoCarb) to Provide Multi-scale Constraints on the Carbon Cycle in the Americas. Frontiers in Environmental Science, 2018, 6, .	1.5	60
47	Atmospheric constraints on gross primary productivity and net ecosystem productivity: Results from a carbonâ€cycle data assimilation system. Global Biogeochemical Cycles, 2012, 26, .	1.9	59
48	The relationship between peak warming and cumulative CO₂ emissions, and its use to quantify vulnerabilities in the carbonâ€"climateâ€"human system. Tellus, Series B: Chemical and Physical Meteorology, 2022, 63, 145.	0.8	58
49	A European summertime CO2biogenic flux inversion at mesoscale from continuous in situ mixing ratio measurements. Journal of Geophysical Research, 2011, 116, n/a-n/a.	3.3	57
50	Estimating global gross primary productivity using chlorophyll fluorescence and a data assimilation system with the BETHY-SCOPE model. Biogeosciences, 2019, 16, 3069-3093.	1.3	57
51	Optimal representation of source-sink fluxes for mesoscale carbon dioxide inversion with synthetic data. Journal of Geophysical Research, 2011, 116, .	3.3	56
52	Reconstructing atmospheric histories from measurements of air composition in firn. Journal of Geophysical Research, 2002, 107, ACH 15-1.	3.3	54
53	Correlations among leaf traits provide a significant constraint on the estimate of global gross primary production. Geophysical Research Letters, 2012, 39, .	1.5	54
54	AIRSâ€based versus flaskâ€based estimation of carbon surface fluxes. Journal of Geophysical Research, 2009, 114, .	3.3	52

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55	Uncertainty in temperature projections reduced using carbon cycle and climate observations. Nature Climate Change, 2013, 3, 725-729.	8.1	52
56	Long-term variability in the global carbon cycle inferred from a high-precision CO₂ and δ¹³C ice-core record. Tellus, Series B: Chemical and Physical Meteorology, 2022, 51, 233.	0.8	48
57	Optimizing the CO2 observing network for constraining sources and sinks. Tellus, Series B: Chemical and Physical Meteorology, 1996, 48, 433-444.	0.8	46
58	Bridging the gap between atmospheric concentrations and local ecosystem measurements. Geophysical Research Letters, 2009, 36, .	1.5	46
59	Constraining regional greenhouse gas emissions using geostationary concentration measurements: a theoretical study. Atmospheric Measurement Techniques, 2014, 7, 3285-3293.	1.2	46
60	What can we learn from European continuous atmospheric CO₂ measurements to quantify regional fluxes â€" Part 2: Sensitivity of flux accuracy to inverse setup. Atmospheric Chemistry and Physics, 2010, 10, 3119-3129.	1.9	43
61	Long-term variability in the global carbon cycle inferred from a high-precision CO2 and delta13C ice-core record. Tellus, Series B: Chemical and Physical Meteorology, 1999, 51, 233-248.	0.8	42
62	Assimilating solar-induced chlorophyll fluorescence into the terrestrial biosphere model BETHY-SCOPE v1.0: model description and information content. Geoscientific Model Development, 2018, 11, 1517-1536.	1.3	42
63	Optimizing the CO₂ observing network for constraining sources and sinks. Tellus, Series B: Chemical and Physical Meteorology, 2022, 48, 433.	0.8	41
64	Atmospheric CO₂inversion validation using vertical profile measurements: Analysis of four independent inversion models. Journal of Geophysical Research, 2011, 116, .	3.3	41
65	Sensitivity of inverse estimation of annual mean CO2sources and sinks to ocean-only sites versus all-sites observational networks. Geophysical Research Letters, 2006, 33, .	1.5	40
66	What can we learn from European continuous atmospheric CO₂ measurements to quantify regional fluxes â€" Part 1: Potential of the 2001 network. Atmospheric Chemistry and Physics, 2010, 10, 3107-3117.	1.9	40
67	Low atmospheric CO2 levels during the Little Ice Age due to cooling-induced terrestrial uptake. Nature Geoscience, 2016, 9, 691-694.	5.4	40
68	Global observations of the carbon budget 3. Initial assessment of the impact of satellite orbit, scan geometry, and cloud on measuring CO2 from space. Journal of Geophysical Research, 2002, 107, ACH 2-1-ACH 2-7.	3.3	39
69	Potential of a geostationary geoCARB mission to estimate surface emissions of CO₂, CH₄ and CO in a polluted urban environment: case study Shanghai. Atmospheric Measurement Techniques, 2016, 9, 4633-4654.	1.2	38
70	Atmospheric abundance and global emissions of perfluorocarbons CF₄, C₂F₆ and C₃F₈ since 1800 inferred from ice core, firn, air archive and in situ measurements. Atmospheric Chemistry and Physics, 2016, 16, 11733-11754.	1.9	35
71	The current state of carbon-cycle data assimilation. Current Opinion in Environmental Sustainability, 2010, 2, 289-296.	3.1	34
72	Joint assimilation of eddy covariance flux measurements and FAPAR products over temperate forests within a processâ€oriented biosphere model. Journal of Geophysical Research G: Biogeosciences, 2015, 120, 1839-1857.	1.3	34

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73	Kalman filter analysis of ice core data 2. Double deconvolution of CO2and Î´13C measurements. Journal of Geophysical Research, 2002, 107, ACH 5-1.	3.3	33
74	A global analysis of urban design types and road transport injury: an image processing study. Lancet Planetary Health, The, 2020, 4, e32-e42.	5.1	32
75	Observing the continental-scale carbon balance: assessment of sampling complementarity and redundancy in a terrestrial assimilation system by means of quantitative network design. Atmospheric Chemistry and Physics, 2012, 12, 7867-7879.	1.9	31
76	Fundamentals of data assimilation applied to biogeochemistry. Atmospheric Chemistry and Physics, 2019, 19, 13911-13932.	1.9	31
77	Using the Kalman filter for parameter estimation in biogeochemical models. Environmetrics, 2008, 19, 849-870.	0.6	30
78	Carbon Cycle Uncertainty in REgional Carbon Cycle Assessment and Processes (RECCAP). Biogeosciences, 2012, 9, 2889-2904.	1.3	30
79	Dominant regions and drivers of the variability of the global land carbon sink across timescales. Global Change Biology, 2018, 24, 3954-3968.	4.2	30
80	A Clean Air Plan for Sydney: An Overview of the Special Issue on Air Quality in New South Wales. Atmosphere, 2019, 10, 774.	1.0	29
81	Title is missing!. Climatic Change, 2002, 55, 273-285.	1.7	28
82	Data and modelling requirements for CO2 inversions using high-frequency data. Tellus, Series B: Chemical and Physical Meteorology, 2003, 55, 512-521.	0.8	27
83	Tangent linear and adjoint biogeochemical models. Geophysical Monograph Series, 2000, , 33-48.	0.1	26
84	Green's function methods of tracer inversion. Geophysical Monograph Series, 2000, , 19-31.	0.1	26
85	Inversion of diurnally varying synthetic CO2: Network optimization for an Australian test case. Global Biogeochemical Cycles, 2004, 18, n/a-n/a.	1.9	25
86	Simultaneous mass balance inverse modeling of methane and carbon monoxide. Journal of Geophysical Research, 2005, 110, .	3.3	25
87	How well do different tracers constrain the firn diffusivity profile?. Atmospheric Chemistry and Physics, 2013, 13, 1485-1510.	1.9	25
88	Greenhouse gas network design using backward Lagrangian particle dispersion modelling â€“ Part 2: Sensitivity analyses and South African test case. Atmospheric Chemistry and Physics, 2015, 15, 2051-2069.	1.9	25
89	Hot Summers: Effect of Extreme Temperatures on Ozone in Sydney, Australia. Atmosphere, 2018, 9, 466.	1.0	25
90	A Road Map for Improving the Treatment of Uncertainties in Highâ€Resolution Regional Carbon Flux Inverse Estimates. Geophysical Research Letters, 2019, 46, 13461-13469.	1.5	23

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91	Constraining predictions of the carbon cycle using data. Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences, 2011, 369, 1955-1966.	1.6	22
92	Greenhouse gas network design using backward Lagrangian particle dispersion modelling â˘ Part 1: Methodology and Australian test case. Atmospheric Chemistry and Physics, 2014, 14, 9363-9378.	1.9	22
93	Estimates of CO₂ fluxes over the city of Cape Town, South Africa, through Bayesian inverse modelling. Atmospheric Chemistry and Physics, 2018, 18, 4765-4801.	1.9	22
94	Two decades of ocean CO₂ sink and variability. Tellus, Series B: Chemical and Physical Meteorology, 2022, 55, 649.	0.8	20
95	Impacts of seasonal covariance on CO2inversions. Global Biogeochemical Cycles, 1999, 13, 845-856.	1.9	19
96	A three-dimensional synthesis inversion of the molecular hydrogen cycle: Sources and sinks budget and implications for the soil uptake. Journal of Geophysical Research, 2011, 116, .	3.3	19
97	Estimating bacteria emissions from inversion of atmospheric transport: sensitivity to modelled particle characteristics. Atmospheric Chemistry and Physics, 2013, 13, 5473-5488.	1.9	19
98	An Example of an Automatic Differentiation-Based Modelling System. Lecture Notes in Computer Science, 2003, , 95-104.	1.0	19
99	Linear and nonlinear effects of dominant drivers on the trends in global and regional land carbon uptake: 1959 to 2013. Geophysical Research Letters, 2016, 43, 1607-1614.	1.5	18
100	Combining Measurements of Built-up Area, Nighttime Light, and Travel Time Distance for Detecting Changes in Urban Boundaries: Introducing the BUNTUS Algorithm. Remote Sensing, 2019, 11, 2969.	1.8	17
101	Mass balance inverse modelling of methane in the 1990s using a Chemistry Transport Model. Atmospheric Chemistry and Physics, 2004, 4, 2561-2580.	1.9	16
102	Quantifying the constraint of biospheric process parameters by CO₂ concentration and flux measurement networks through a carbon cycle data assimilation system. Atmospheric Chemistry and Physics, 2013, 13, 10555-10572.	1.9	16
103	Evaluation of Regional Air Quality Models over Sydney, Australia: Part 2, Comparison of PM2.5 and Ozone. Atmosphere, 2020, 11, 233.	1.0	15
104	Differences of CO2 flux estimates based on a â€œTime-Independentâ€•versus a â€œTime-[In]Dependentâ€• inversion method. Geophysical Monograph Series, 2000, , 295-309.	0.1	14
105	Local and remote response to zonally uniform sea-surface temperature in a July general circulation model. International Journal of Climatology, 1989, 9, 111-131.	1.5	12
106	Estimating High Latitude Carbon Fluxes With Inversions Of Atmospheric CO2. Mitigation and Adaptation Strategies for Global Change, 2006, 11, 769-782.	1.0	12
107	Impact of the atmospheric sink and vertical mixing on nitrous oxide fluxes estimated using inversion methods. Journal of Geophysical Research, 2011, 116, .	3.3	12
108	Assimilation and Network Design. Ecological Studies, 2008, , 33-52.	0.4	12

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109	Progress in development of Tropospheric Infrared Mapping Spectrometers (TIMS): GeoCARB Greenhouse Gas (GHG) application. Proceedings of SPIE, 2013, , .	0.8	11
110	The potential of Orbiting Carbon Observatory-2 data to reduce the uncertainties in CO₂ surface fluxes over Australia using a variational assimilation scheme. Atmospheric Chemistry and Physics, 2020, 20, 8473-8500.	1.9	11
111	Designing optimal greenhouse gas monitoring networksÂforÂAustralia. Geoscientific Instrumentation, Methods and Data Systems, 2016, 5, 1-15.	0.6	11
112	Kalman filter analysis of ice core data 1. Method development and testing the statistics. Journal of Geophysical Research, 2002, 107, ACH 4-1.	3.3	10
113	On the variation of regional CO₂ exchange over temperate and boreal North America. Global Biogeochemical Cycles, 2013, 27, 991-1000.	1.9	10
114	Sensitivity of simulated CO₂ concentration to regridding of global fossil fuel CO₂ emissions. Geoscientific Model Development, 2014, 7, 2867-2874.	1.3	9
115	Sensitivity of simulated CO₂ concentration to sub-annual variations in fossil fuel CO₂ emissions. Atmospheric Chemistry and Physics, 2016, 16, 1907-1918.	1.9	9
116	Reviews and syntheses: guiding the evolution of the observing system for the carbon cycle through quantitative network design. Biogeosciences, 2017, 14, 4755-4766.	1.3	9
117	Recent changes in the global and regional carbon cycle: analysis of first-order diagnostics. Biogeosciences, 2015, 12, 835-844.	1.3	8
118	The impact of filtering selfâ€organizing maps: a case study with Australian pressure and rainfall. International Journal of Climatology, 2015, 35, 624-633.	1.5	8
119	Was Australia a sink or source of CO₂ in 2015? Data assimilation using OCO-2 satellite measurements. Atmospheric Chemistry and Physics, 2021, 21, 17453-17494.	1.9	8
120	Can we detect regional methane anomalies? A comparison between three observing systems. Atmospheric Chemistry and Physics, 2016, 16, 9089-9108.	1.9	7
121	Optimising the deployment of renewable resources for the Australian NEM (National Electricity) Tj ETQq1 1 0.784314 rgBT /Overlock 10	4.5	7
122	An atmospheric inversion over the city of Cape Town: sensitivity analyses. Atmospheric Chemistry and Physics, 2019, 19, 7789-7816.	1.9	7
123	Estimation theory and atmospheric data assimilation. Geophysical Monograph Series, 2000, , 49-65.	0.1	6
124	How do carbon cycle uncertainties affect <scp>IPCC</scp> temperature projections?. Atmospheric Science Letters, 2016, 17, 236-242.	0.8	6
125	Causal knowledge promotes behavioral self-regulation: An example using climate change dynamics. PLoS ONE, 2017, 12, e0184480.	1.1	6
126	Comparison of the genetic algorithm and incremental optimisation routines for a Bayesian inverse modelling based network design. Inverse Problems, 2018, 34, 055006.	1.0	6

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127	Tracer assimilation. Geophysical Monograph Series, 2000, , 67-79.	0.1	5
128	Data and modelling requirements for CO2 inversions using high-frequency data. Tellus, Series B: Chemical and Physical Meteorology, 2003, 55, 512-521.	0.8	5
129	Impacts of atmospheric state uncertainty on O₂ measurement requirements for the ASCENDS mission. Atmospheric Measurement Techniques, 2015, 8, 2685-2697.	1.2	5
130	Multi-species chemical data assimilation with the Danish Eulerian hemispheric model: system description and verification. Journal of Atmospheric Chemistry, 2016, 73, 261-302.	1.4	5
131	A small climate-amplifying effect of climate-carbon cycle feedback. Nature Communications, 2021, 12, 2952.	5.8	5
132	Assimilation of atmospheric CO2 observations from space can support national CO2 emission inventories. Environmental Research Letters, 0, , .	2.2	5
133	Interannual variability in the Australian carbon cycle over 2015â€“2019, based on assimilation of Orbiting Carbon Observatory-2 (OCO-2) satellite data. Atmospheric Chemistry and Physics, 2022, 22, 8897-8934.	1.9	5
134	Atmospheric Perspectives on the Ocean Carbon Cycle. , 2001, , 285-294.		4
135	Greenhouse Gas Concentration and Volcanic Eruptions Controlled the Variability of Terrestrial Carbon Uptake Over the Last Millennium. Journal of Advances in Modeling Earth Systems, 2019, 11, 1715-1734.	1.3	3
136	Data assimilation using an ensemble of models: a hierarchical approach. Atmospheric Chemistry and Physics, 2020, 20, 3725-3737.	1.9	3
137	Assessing the Impact of Atmospheric CO2 and NO2 Measurements From Space on Estimating City-Scale Fossil Fuel CO2 Emissions in a Data Assimilation System. Frontiers in Remote Sensing, 2022, 3, .	1.3	1