

Carl I Steefel

List of Publications by Year in descending order

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Version: 2024-02-01

107
papers

8,915
citations

41344

49
h-index

42399

92
g-index

114
all docs

114
docs citations

114
times ranked

5918
citing authors

#	ARTICLE	IF	CITATIONS
1	Editorial: Chemical Export to River Systems From the Critical Zone. <i>Frontiers in Water</i> , 2022, 3, .	2.3	0
2	Investigation of Coupled Processes in Fractures and the Bordering Matrix via a Micro-Continuum Reactive Transport Model. <i>Water Resources Research</i> , 2022, 58, .	4.2	12
3	From legacy contamination to watershed systems science: a review of scientific insights and technologies developed through DOE-supported research in water and energy security. <i>Environmental Research Letters</i> , 2022, 17, 043004.	5.2	12
4	Hot Spots and Hot Moments in the Critical Zone: Identification of and Incorporation into Reactive Transport Models. , 2022, , 9-47.		7
5	Modeling diffusion processes in the presence of a diffuse layer at charged mineral surfaces: a benchmark exercise. <i>Computational Geosciences</i> , 2021, 25, 1319-1336.	2.4	17
6	Simulation of mineral dissolution at the pore scale with evolving fluid-solid interfaces: review of approaches and benchmark problem set. <i>Computational Geosciences</i> , 2021, 25, 1285-1318.	2.4	72
7	A model for discrete fracture-clay rock interaction incorporating electrostatic effects on transport. <i>Computational Geosciences</i> , 2021, 25, 395-410.	2.4	9
8	Microbially mediated kinetic sulfur isotope fractionation: reactive transport modeling benchmark. <i>Computational Geosciences</i> , 2021, 25, 1379-1391.	2.4	5
9	Modeling the Impact of Riparian Hollows on River Corridor Nitrogen Exports. <i>Frontiers in Water</i> , 2021, 3, .	2.3	15
10	Modeling geogenic and atmospheric nitrogen through the East River Watershed, Colorado Rocky Mountains. <i>PLoS ONE</i> , 2021, 16, e0247907.	2.5	9
11	Hysteresis Patterns of Watershed Nitrogen Retention and Loss Over the Past 50 Years in United States Hydrological Basins. <i>Global Biogeochemical Cycles</i> , 2021, 35, e2020GB006777.	4.9	29
12	A Pore-Scale Investigation of Mineral Precipitation Driven Diffusivity Change at the Column-Scale. <i>Water Resources Research</i> , 2021, 57, e2020WR028483.	4.2	19
13	Secondary magnesite formation from forsterite under CO2 sequestration conditions via coupled heterogeneous nucleation and crystal growth. <i>Geochimica Et Cosmochimica Acta</i> , 2021, 311, 29-42.	3.9	6
14	Microscale Mechanical-Chemical Modeling of Granular Salt: Insights for Creep. <i>Journal of Geophysical Research: Solid Earth</i> , 2021, 126, .	3.4	6
15	Guest Editorial to the CouFrac 2018 Special Issue Coupled Thermal-Hydro-Mechanical-Chemical Processes in Fractured Media: Microscale to Macroscale Numerical Modeling. <i>Computational Geosciences</i> , 2020, 24, 1747-1749.	2.4	0
16	Sequential Imputation of Missing Spatio-Temporal Precipitation Data Using Random Forests. <i>Frontiers in Water</i> , 2020, 2, .	2.3	24
17	Wavelet-based local mesh refinement for rainfall-runoff simulations. <i>Journal of Hydroinformatics</i> , 2020, 22, 1059-1077.	2.4	14
18	Exascale applications: skin in the game. <i>Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences</i> , 2020, 378, 20190056.	3.4	53

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19	Determining How Critical Zone Structure Constrains Hydrogeochemical Behavior of Watersheds: Learning From an Elevation Gradient in California's Sierra Nevada. <i>Frontiers in Water</i> , 2020, 2, .	2.3	17
20	Differential C-Q Analysis: A New Approach to Inferring Lateral Transport and Hydrologic Transients Within Multiple Reaches of a Mountainous Headwater Catchment. <i>Frontiers in Water</i> , 2020, 2, .	2.3	24
21	Dissolved Carbonate and pH Control the Dissolution of Uranyl Phosphate Minerals in Flow-Through Porous Media. <i>Environmental Science & Technology</i> , 2020, 54, 6031-6042.	10.0	11
22	Solving the Nernst-Planck Equation in Heterogeneous Porous Media With Finite Volume Methods: Averaging Approaches at Interfaces. <i>Water Resources Research</i> , 2020, 56, e2019WR026832.	4.2	11
23	Early Diagenesis of Lacustrine Carbonates in Volcanic Settings: The Role of Magmatic CO ₂ (Lake Dziani Dzaha, Mayotte, Indian Ocean). <i>ACS Earth and Space Chemistry</i> , 2020, 4, 363-378.	2.7	18
24	Distinct Source Water Chemistry Shapes Contrasting Concentration-Discharge Patterns. <i>Water Resources Research</i> , 2019, 55, 4233-4251.	4.2	103
25	Multi-scale Model of Reactive Transport in Fractured Media: Diffusion Limitations on Rates. <i>Transport in Porous Media</i> , 2019, 128, 701-721.	2.6	32
26	Modeling the Ionic Strength Effect on Diffusion in Clay. The DR-A Experiment at Mont Terri. <i>ACS Earth and Space Chemistry</i> , 2019, 3, 442-451.	2.7	25
27	1. Reactive Transport at the Crossroads. , 2019, , 1-26.		0
28	Reactive Transport in Evolving Porous Media. <i>Reviews in Mineralogy and Geochemistry</i> , 2019, 85, 197-238.	4.8	65
29	7. Reactive Transport in Evolving Porous Media. , 2019, , 197-238.		1
30	Reactive Transport at the Crossroads. <i>Reviews in Mineralogy and Geochemistry</i> , 2019, 85, 1-26.	4.8	46
31	Reactive Transport Modeling of Coupled Processes in Nanoporous Media. <i>Reviews in Mineralogy and Geochemistry</i> , 2019, 85, 75-109.	4.8	43
32	4. Reactive Transport Modeling of Coupled Processes in Nanoporous Media. , 2019, , 75-110.		0
33	Hot Spots and Hot Moments of Nitrogen in a Riparian Corridor. <i>Water Resources Research</i> , 2018, 54, 205-222.	4.2	99
34	Fracture Evolution in Multimineral Systems: The Role of Mineral Composition, Flow Rate, and Fracture Aperture Heterogeneity. <i>ACS Earth and Space Chemistry</i> , 2018, 2, 112-124.	2.7	49
35	Investigating calcite growth rates using a quartz crystal microbalance with dissipation (QCM-D). <i>Geochimica Et Cosmochimica Acta</i> , 2018, 222, 269-283.	3.9	19
36	The East River, Colorado, Watershed: A Mountainous Community Testbed for Improving Predictive Understanding of Multiscale Hydrological-Biogeochemical Dynamics. <i>Vadose Zone Journal</i> , 2018, 17, 1-25.	2.2	115

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37	Geochemical Exports to River From the Intrameander Hyporheic Zone Under Transient Hydrologic Conditions: East River Mountainous Watershed, Colorado. <i>Water Resources Research</i> , 2018, 54, 8456-8477.	4.2	66
38	Pore-scale numerical investigation of the impacts of surface roughness: Upscaling of reaction rates in rough fractures. <i>Geochimica Et Cosmochimica Acta</i> , 2018, 239, 374-389.	3.9	79
39	Evaluation of accessible mineral surface areas for improved prediction of mineral reaction rates in porous media. <i>Geochimica Et Cosmochimica Acta</i> , 2017, 205, 31-49.	3.9	79
40	Water Table Dynamics and Biogeochemical Cycling in a Shallow, Variably-Saturated Floodplain. <i>Environmental Science & Technology</i> , 2017, 51, 3307-3317.	10.0	100
41	Mineralogical and transport controls on the evolution of porous media texture using direct numerical simulation. <i>Water Resources Research</i> , 2017, 53, 3645-3661.	4.2	49
42	Reoxidation of Chromium(III) Products Formed under Different Biogeochemical Regimes. <i>Environmental Science & Technology</i> , 2017, 51, 4918-4927.	10.0	60
43	Rates and mechanisms of uranyl oxyhydroxide mineral dissolution. <i>Geochimica Et Cosmochimica Acta</i> , 2017, 207, 298-321.	3.9	12
44	Alteration and Erosion of Rock Matrix Bordering a Carbonate-Rich Shale Fracture. <i>Environmental Science & Technology</i> , 2017, 51, 8861-8868.	10.0	50
45	Incorporating Nanoscale Effects into a Continuum-Scale Reactive Transport Model for CO ₂ -Deteriorated Cement. <i>Environmental Science & Technology</i> , 2017, 51, 10861-10871.	10.0	25
46	Expanding the role of reactive transport models in critical zone processes. <i>Earth-Science Reviews</i> , 2017, 165, 280-301.	9.1	207
47	Effects of pore-scale precipitation on permeability and flow. <i>Advances in Water Resources</i> , 2016, 95, 125-137.	3.8	70
48	Identifying geochemical hot moments and their controls on a contaminated river floodplain system using wavelet and entropy approaches. <i>Environmental Modelling and Software</i> , 2016, 85, 27-41.	4.5	35
49	A 2.5D Reactive Transport Model for Fracture Alteration Simulation. <i>Environmental Science & Technology</i> , 2016, 50, 7564-7571.	10.0	79
50	Evaluation of mineral reactive surface area estimates for prediction of reactivity of a multi-mineral sediment. <i>Geochimica Et Cosmochimica Acta</i> , 2016, 188, 310-329.	3.9	108
51	Influence of hydrological, biogeochemical and temperature transients on subsurface carbon fluxes in a flood plain environment. <i>Biogeochemistry</i> , 2016, 127, 367-396.	3.5	76
52	7. Micro-Continuum Approaches for Modeling Pore-Scale Geochemical Processes. , 2015, , 217-246.		2
53	Surface Properties of Clay Minerals. <i>Developments in Clay Science</i> , 2015, 6, 5-31.	0.5	56
54	Complete Restriction of ³⁶ Cl ⁻ Diffusion by Celestite Precipitation in Densely Compacted Illite. <i>Environmental Science and Technology Letters</i> , 2015, 2, 139-143.	8.7	34

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55	Reactive transport benchmarks for subsurface environmental simulation. Computational Geosciences, 2015, 19, 439-443.	2.4	31
56	Benchmarks for multicomponent reactive transport across a cement/clay interface. Computational Geosciences, 2015, 19, 635-653.	2.4	43
57	A reactive transport benchmark on heavy metal cycling in lake sediments. Computational Geosciences, 2015, 19, 613-633.	2.4	30
58	Chemical affinity and pH effects on chlorite dissolution kinetics under geological CO ₂ sequestration related conditions. Chemical Geology, 2015, 396, 208-217.	3.3	23
59	Benchmarking the simulation of Cr isotope fractionation. Computational Geosciences, 2015, 19, 497-521.	2.4	27
60	ParCrunchFlow: an efficient, parallel reactive transport simulation tool for physically and chemically heterogeneous saturated subsurface environments. Computational Geosciences, 2015, 19, 403-422.	2.4	39
61	Benchmarks for multicomponent diffusion and electrochemical migration. Computational Geosciences, 2015, 19, 523-533.	2.4	42
62	Ionic Transport in Nano-Porous Clays with Consideration of Electrostatic Effects. Reviews in Mineralogy and Geochemistry, 2015, 80, 287-329.	4.8	51
63	Micro-Continuum Approaches for Modeling Pore-Scale Geochemical Processes. Reviews in Mineralogy and Geochemistry, 2015, 80, 217-246.	4.8	88
64	Benchmark problems for reactive transport modeling of the generation and attenuation of acid rock drainage. Computational Geosciences, 2015, 19, 599-611.	2.4	26
65	Benchmark reactive transport simulations of a column experiment in compacted bentonite with multispecies diffusion and explicit treatment of electrostatic effects. Computational Geosciences, 2015, 19, 535-550.	2.4	45
66	Implementation and evaluation of permeability-porosity and tortuosity-porosity relationships linked to mineral dissolution-precipitation. Computational Geosciences, 2015, 19, 655-671.	2.4	60
67	Reactive transport codes for subsurface environmental simulation. Computational Geosciences, 2015, 19, 445-478.	2.4	566
68	High-Resolution Simulation of Pore-Scale Reactive Transport Processes Associated with Carbon Sequestration. Computing in Science and Engineering, 2014, 16, 22-31.	1.2	51
69	Pore-Scale Controls on Calcite Dissolution Rates from Flow-through Laboratory and Numerical Experiments. Environmental Science & Technology, 2014, 48, 7453-7460.	10.0	154
70	Modeling Coupled Chemical and Isotopic Equilibration Rates. Procedia Earth and Planetary Science, 2014, 10, 208-217.	0.6	38
71	Divergent Aquifer Biogeochemical Systems Converge on Similar and Unexpected Cr(VI) Reduction Products. Environmental Science & Technology, 2014, 48, 10699-10706.	10.0	24
72	A large column analog experiment of stable isotope variations during reactive transport: I. A comprehensive model of sulfur cycling and ³⁴ S fractionation. Geochimica Et Cosmochimica Acta, 2014, 124, 366-393.	3.9	71

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73	Pore Scale Processes Associated with Subsurface CO ₂ Injection and Sequestration. <i>Reviews in Mineralogy and Geochemistry</i> , 2013, 77, 259-303.	4.8	83
74	Calcium isotope fractionation in groundwater: Molecular scale processes influencing field scale behavior. <i>Geochimica Et Cosmochimica Acta</i> , 2013, 119, 93-116.	3.9	70
75	Biostimulation induces syntrophic interactions that impact C, S and N cycling in a sediment microbial community. <i>ISME Journal</i> , 2013, 7, 800-816.	9.8	98
76	Upscaling Calcite Growth Rates from the Mesoscale to the Macroscale. <i>Environmental Science & Technology</i> , 2013, 47, 7555-7562.	10.0	42
77	Timing the Onset of Sulfate Reduction over Multiple Subsurface Acetate Amendments by Measurement and Modeling of Sulfur Isotope Fractionation. <i>Environmental Science & Technology</i> , 2012, 46, 8895-8902.	10.0	66
78	Measurement of accessible reactive surface area in a sandstone, with application to CO ₂ mineralization. <i>Chemical Geology</i> , 2012, 318-319, 113-125.	3.3	95
79	Upscaling calcium carbonate precipitation rates from pore to continuum scale. <i>Chemical Geology</i> , 2012, 318-319, 60-74.	3.3	99
80	Molecular Dynamics Simulations of Water Structure and Diffusion in Silica Nanopores. <i>Journal of Physical Chemistry C</i> , 2012, 116, 11556-11564.	3.1	223
81	An investigation of the effect of pore scale flow on average geochemical reaction rates using direct numerical simulation. <i>Water Resources Research</i> , 2012, 48, .	4.2	238
82	Acetate Availability and its Influence on Sustainable Bioremediation of Uranium-Contaminated Groundwater. <i>Geomicrobiology Journal</i> , 2011, 28, 519-539.	2.0	222
83	Strontium and Cesium Release Mechanisms during Unsaturated Flow through Waste-Weathered Hanford Sediments. <i>Environmental Science & Technology</i> , 2011, 45, 8313-8320.	10.0	21
84	Physicochemical Heterogeneity Controls on Uranium Bioreduction Rates at the Field Scale. <i>Environmental Science & Technology</i> , 2011, 45, 9959-9966.	10.0	79
85	A reactive-transport model for weathering rind formation on basalt. <i>Geochimica Et Cosmochimica Acta</i> , 2011, 75, 7644-7667.	3.9	126
86	Effects of physical and geochemical heterogeneities on mineral transformation and biomass accumulation during biostimulation experiments at Rifle, Colorado. <i>Journal of Contaminant Hydrology</i> , 2010, 112, 45-63.	3.3	137
87	Fluid-Rock Interaction: A Reactive Transport Approach. <i>Reviews in Mineralogy and Geochemistry</i> , 2009, 70, 485-532.	4.8	182
88	Feedbacks Between Hydrological Heterogeneity and Bioremediation Induced Biogeochemical Transformations. <i>Environmental Science & Technology</i> , 2009, 43, 5197-5204.	10.0	34
89	Mineral Transformation and Biomass Accumulation Associated With Uranium Bioremediation at Rifle, Colorado. <i>Environmental Science & Technology</i> , 2009, 43, 5429-5435.	10.0	101
90	The role of reaction affinity and secondary minerals in regulating chemical weathering rates at the Santa Cruz Soil Chronosequence, California. <i>Geochimica Et Cosmochimica Acta</i> , 2009, 73, 2804-2831.	3.9	280

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91	Evolution of porosity and diffusivity associated with chemical weathering of a basalt clast. <i>Journal of Geophysical Research</i> , 2009, 114, .	3.3	117
92	Solid phase evolution in the Biosphere 2 hillslope experiment as predicted by modeling of hydrologic and geochemical fluxes. <i>Hydrology and Earth System Sciences</i> , 2009, 13, 2273-2286.	4.9	23
93	<i>Geochemical Kinetics and Transport.</i> , 2008, , 545-589.		33
94	Scale dependence of mineral dissolution rates within single pores and fractures. <i>Geochimica Et Cosmochimica Acta</i> , 2008, 72, 360-377.	3.9	199
95	The mineral dissolution rate conundrum: Insights from reactive transport modeling of U isotopes and pore fluid chemistry in marine sediments. <i>Geochimica Et Cosmochimica Acta</i> , 2006, 70, 337-363.	3.9	234
96	Reactive transport modeling: An essential tool and a new research approach for the Earth sciences. <i>Earth and Planetary Science Letters</i> , 2005, 240, 539-558.	4.4	546
97	Assessing conceptual models for subsurface reactive transport of inorganic contaminants. <i>Eos</i> , 2004, 85, 449.	0.1	39
98	Cesium migration in Hanford sediment: a multisite cation exchange model based on laboratory transport experiments. <i>Journal of Contaminant Hydrology</i> , 2003, 67, 219-246.	3.3	136
99	Effect of fluid-sediment reaction on hydrothermal fluxes of major elements, eastern flank of the Juan de Fuca Ridge. <i>Geochimica Et Cosmochimica Acta</i> , 2002, 66, 1739-1757.	3.9	87
100	Fluid Flow, Heat Transfer, and Solute Transport at Nuclear Waste Storage Tanks in the Hanford Vadose Zone. <i>Vadose Zone Journal</i> , 2002, 1, 68-88.	2.2	35
101	Fluid Flow, Heat Transfer, and Solute Transport at Nuclear Waste Storage Tanks in the Hanford Vadose Zone. <i>Vadose Zone Journal</i> , 2002, 1, 68.	2.2	5
102	Fluid Flow, Heat Transfer, and Solute Transport at Nuclear Waste Storage Tanks in the Hanford Vadose Zone. <i>Vadose Zone Journal</i> , 2002, 1, 68-88.	2.2	2
103	A high resolution estimate of the inorganic nitrogen flux from the Scheldt estuary to the coastal North Sea during a nitrogen-limited algal bloom, spring 1995. <i>Geochimica Et Cosmochimica Acta</i> , 1999, 63, 1359-1374.	3.9	43
104	Multicomponent reactive transport in discrete fractures: I. Controls on reaction front geometry. <i>Journal of Hydrology</i> , 1998, 209, 186-199.	5.4	117
105	Chapter 2. APPROACHES TO MODELING OF REACTIVE TRANSPORT IN POROUS MEDIA. , 1996, , 83-130.		119
106	Diffusion and reaction in rock matrix bordering a hyperalkaline fluid-filled fracture. <i>Geochimica Et Cosmochimica Acta</i> , 1994, 58, 3595-3612.	3.9	153
107	A new kinetic approach to modeling water-rock interaction: The role of nucleation, precursors, and Ostwald ripening. <i>Geochimica Et Cosmochimica Acta</i> , 1990, 54, 2657-2677.	3.9	477