

Wolfgang Nowak

List of Publications by Year in descending order

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133
papers

4,526
citations

94269

37
h-index

118652

62
g-index

156
all docs

156
docs citations

156
times ranked

4242
citing authors

#	ARTICLE	IF	CITATIONS
1	Modeling Soil Processes: Review, Key Challenges, and New Perspectives. <i>Vadose Zone Journal</i> , 2016, 15, 1-57.	1.3	445
2	Data-driven uncertainty quantification using the arbitrary polynomial chaos expansion. <i>Reliability Engineering and System Safety</i> , 2012, 106, 179-190.	5.1	324
3	Parameter estimation by ensemble Kalman filters with transformed data: Approach and application to hydraulic tomography. <i>Water Resources Research</i> , 2012, 48, .	1.7	136
4	How much electrical energy storage do we need? A synthesis for the U.S., Europe, and Germany. <i>Journal of Cleaner Production</i> , 2018, 181, 449-459.	4.6	130
5	Challenges and trends of energy storage expansion planning for flexibility provision in low-carbon power systems – a review. <i>Renewable and Sustainable Energy Reviews</i> , 2017, 80, 603-619.	8.2	109
6	Model selection on solid ground: Rigorous comparison of nine ways to evaluate Bayesian model evidence. <i>Water Resources Research</i> , 2014, 50, 9484-9513.	1.7	107
7	Bayesian geostatistical design: Task-driven optimal site investigation when the geostatistical model is uncertain. <i>Water Resources Research</i> , 2010, 46, .	1.7	103
8	Flow topology and scalar mixing in spatially heterogeneous flow fields. <i>Geophysical Research Letters</i> , 2012, 39, .	1.5	100
9	A concept for data-driven uncertainty quantification and its application to carbon dioxide storage in geological formations. <i>Advances in Water Resources</i> , 2011, 34, 1508-1518.	1.7	92
10	Anthropogenic Trace Compounds (ATCs) in aquatic habitats – Research needs on sources, fate, detection and toxicity to ensure timely elimination strategies and risk management. <i>Environment International</i> , 2015, 79, 85-105.	4.8	86
11	Best unbiased ensemble linearization and the quasi-linear Kalman ensemble generator. <i>Water Resources Research</i> , 2009, 45, .	1.7	84
12	Reliability analysis with stratified importance sampling based on adaptive Kriging. <i>Reliability Engineering and System Safety</i> , 2020, 197, 106852.	5.1	82
13	Geostatistical inverse modeling of transient pumping tests using temporal moments of drawdown. <i>Water Resources Research</i> , 2005, 41, .	1.7	73
14	Title is missing!. <i>Mathematical Geosciences</i> , 2003, 35, 53-66.	0.9	72
15	Catchments as reactors: a comprehensive approach for water fluxes and solute turnover. <i>Environmental Earth Sciences</i> , 2013, 69, 317-333.	1.3	71
16	A Primer for Model Selection: The Decisive Role of Model Complexity. <i>Water Resources Research</i> , 2018, 54, 1688-1715.	1.7	71
17	Floating photovoltaic plants: Ecological impacts versus hydropower operation flexibility. <i>Energy Conversion and Management</i> , 2020, 206, 112414.	4.4	71
18	An integrative approach to robust design and probabilistic risk assessment for CO2 storage in geological formations. <i>Computational Geosciences</i> , 2011, 15, 565-577.	1.2	68

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19	A modified Levenberg-Marquardt algorithm for quasi-linear geostatistical inversing. <i>Advances in Water Resources</i> , 2004, 27, 737-750.	1.7	66
20	Stochastic flux-related analysis of transverse mixing in two-dimensional heterogeneous porous media. <i>Water Resources Research</i> , 2011, 47, .	1.7	66
21	Experiments on vertical transverse mixing in a large-scale heterogeneous model aquifer. <i>Journal of Contaminant Hydrology</i> , 2005, 80, 130-148.	1.6	64
22	Bayesian assessment of the expected data impact on prediction confidence in optimal sampling design. <i>Water Resources Research</i> , 2012, 48, .	1.7	64
23	Geostatistical inference of hydraulic conductivity and dispersivities from hydraulic heads and tracer data. <i>Water Resources Research</i> , 2006, 42, .	1.7	62
24	Uncertainty evaluation of mass discharge estimates from a contaminated site using a fully Bayesian framework. <i>Water Resources Research</i> , 2010, 46, .	1.7	62
25	Global sensitivity analysis: A flexible and efficient framework with an example from stochastic hydrogeology. <i>Advances in Water Resources</i> , 2012, 37, 10-22.	1.7	60
26	A multi-service approach for planning the optimal mix of energy storage technologies in a fully-renewable power supply. <i>Energy Conversion and Management</i> , 2018, 178, 355-368.	4.4	58
27	Flow Radar Glyphs—Static Visualization of Unsteady Flow with Uncertainty. <i>IEEE Transactions on Visualization and Computer Graphics</i> , 2011, 17, 1949-1958.	2.9	51
28	Impact of sampling volume on the probability density function of steady state concentration. <i>Water Resources Research</i> , 2008, 44, .	1.7	49
29	The hydrologist's guide to Bayesian model selection, averaging and combination. <i>Journal of Hydrology</i> , 2019, 572, 96-107.	2.3	49
30	Hybrid green-blue-gray decentralized urban drainage systems design, a simulation-optimization framework. <i>Journal of Environmental Management</i> , 2019, 249, 109364.	3.8	46
31	Stochastic evaluation of mixing-controlled steady-state plume lengths in two-dimensional heterogeneous domains. <i>Journal of Contaminant Hydrology</i> , 2012, 138-139, 22-39.	1.6	45
32	Probability density functions of hydraulic head and velocity in three-dimensional heterogeneous porous media. <i>Water Resources Research</i> , 2008, 44, .	1.7	44
33	A hypothesis-driven approach to optimize field campaigns. <i>Water Resources Research</i> , 2012, 48, .	1.7	44
34	Application of FFT-based Algorithms for Large-Scale Universal Kriging Problems. <i>Mathematical Geosciences</i> , 2009, 41, 509-533.	1.4	43
35	Bayesian model averaging to explore the worth of data for soil-plant model selection and prediction. <i>Water Resources Research</i> , 2015, 51, 2825-2846.	1.7	43
36	Finding the right balance between groundwater model complexity and experimental effort via Bayesian model selection. <i>Journal of Hydrology</i> , 2015, 531, 96-110.	2.3	41

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37	The comprehensive differential split-sample test: A stress-test for hydrological model robustness under climate variability. <i>Journal of Hydrology</i> , 2019, 573, 501-515.	2.3	40
38	On the link between contaminant source release conditions and plume prediction uncertainty. <i>Journal of Contaminant Hydrology</i> , 2010, 116, 24-34.	1.6	38
39	Geological storage of CO ₂ : Application, feasibility and efficiency of global sensitivity analysis and risk assessment using the arbitrary polynomial chaos. <i>International Journal of Greenhouse Gas Control</i> , 2013, 19, 704-719.	2.3	38
40	Bayesian updating via bootstrap filtering combined with data-driven polynomial chaos expansions: methodology and application to history matching for carbon dioxide storage in geological formations. <i>Computational Geosciences</i> , 2013, 17, 671-687.	1.2	36
41	Uncertainty and data worth analysis for the hydraulic design of funnel-and-gate systems in heterogeneous aquifers. <i>Water Resources Research</i> , 2004, 40, .	1.7	34
42	Temporal moments revisited: Why there is no better way for physically based model reduction in time. <i>Water Resources Research</i> , 2012, 48, .	1.7	34
43	Probabilistic exposure risk assessment with advective “dispersive well vulnerability” criteria. <i>Advances in Water Resources</i> , 2012, 36, 121-132.	1.7	33
44	Predicting DNAPL mass discharge and contaminated site longevity probabilities: Conceptual model and high-resolution stochastic simulation. <i>Water Resources Research</i> , 2015, 51, 806-831.	1.7	33
45	Renewable energy in copper production: A review on systems design and methodological approaches. <i>Journal of Cleaner Production</i> , 2020, 246, 118978.	4.6	33
46	Drainage in heterogeneous sand columns with different geometric structures. <i>Advances in Water Resources</i> , 2008, 31, 1205-1220.	1.7	32
47	A statistical concept to assess the uncertainty in Bayesian model weights and its impact on model ranking. <i>Water Resources Research</i> , 2015, 51, 7524-7546.	1.7	30
48	A divide and conquer approach to cope with uncertainty, human health risk, and decision making in contaminant hydrology. <i>Water Resources Research</i> , 2011, 47, .	1.7	29
49	Entropy-Based Experimental Design for Optimal Model Discrimination in the Geosciences. <i>Entropy</i> , 2016, 18, 409.	1.1	27
50	Copper mining: 100% solar electricity by 2030?. <i>Applied Energy</i> , 2020, 262, 114506.	5.1	27
51	Delineating baseflow contribution areas for streams “A model and methods comparison. <i>Journal of Contaminant Hydrology</i> , 2016, 195, 11-22.	1.6	26
52	Multi-objective planning of energy storage technologies for a fully renewable system: Implications for the main stakeholders in Chile. <i>Energy Policy</i> , 2019, 126, 494-506.	4.2	26
53	Identification of contaminant source architectures “A statistical inversion that emulates multiphase physics in a computationally practicable manner. <i>Water Resources Research</i> , 2016, 52, 1009-1025.	1.7	25
54	Measures of Parameter Uncertainty in Geostatistical Estimation and Geostatistical Optimal Design. <i>Mathematical Geosciences</i> , 2010, 42, 199-221.	1.4	24

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55	Hanging Gardens Algorithm to Generate Decentralized Layouts for the Optimization of Urban Drainage Systems. Journal of Water Resources Planning and Management - ASCE, 2019, 145, .	1.3	23
56	Incomplete statistical information limits the utility of high-order polynomial chaos expansions. Reliability Engineering and System Safety, 2018, 169, 137-148.	5.1	22
57	Toward Sustainable Urban Drainage Infrastructure Planning: A Combined Multiobjective Optimization and Multicriteria Decision-Making Platform. Journal of Water Resources Planning and Management - ASCE, 2021, 147, .	1.3	22
58	Optimal Design of Multitype Groundwater Monitoring Networks Using Easily Accessible Tools. Ground Water, 2016, 54, 861-870.	0.7	21
59	Comparison of data-driven uncertainty quantification methods for a carbon dioxide storage benchmark scenario. Computational Geosciences, 2019, 23, 339-354.	1.2	21
60	A new solution to mitigate hydropeaking? Batteries versus re-regulation reservoirs. Journal of Cleaner Production, 2019, 210, 477-489.	4.6	21
61	First-order variance of travel time in nonstationary formations. Water Resources Research, 2004, 40, .	1.7	20
62	Kriging and Spatial Design Accelerated by Orders of Magnitude: Combining Low-Rank Covariance Approximations with FFT-Techniques. Mathematical Geosciences, 2013, 45, 411-435.	1.4	20
63	Chaos Expansion based Bootstrap Filter to Calibrate CO2 Injection Models. Energy Procedia, 2013, 40, 398-407.	1.8	20
64	Probability density function of steady state concentration in two-dimensional heterogeneous porous media. Water Resources Research, 2011, 47, .	1.7	19
65	Towards optimal allocation of computer resources: Trade-offs between uncertainty quantification, discretization and model reduction. Environmental Modelling and Software, 2013, 50, 97-107.	1.9	19
66	Application of Bayesian geostatistics for evaluation of mass discharge uncertainty at contaminated sites. Water Resources Research, 2012, 48, .	1.7	18
67	Explicit treatment for Dirichlet, Neumann and Cauchy boundary conditions in POD-based reduction of groundwater models. Advances in Water Resources, 2018, 115, 160-171.	1.7	18
68	Estimation of small failure probabilities based on thermodynamic integration and parallel tempering. Mechanical Systems and Signal Processing, 2019, 133, 106248.	4.4	18
69	Bayesian Calibration and Validation of a Large-scale and Time-demanding Sediment Transport Model. Water Resources Research, 2020, 56, e2019WR026966.	1.7	18
70	AN OPTIMAL SAMPLING RULE FOR NONINTRUSIVE POLYNOMIAL CHAOS EXPANSIONS OF EXPENSIVE MODELS. , 2015, 5, 275-295.		17
71	Nine Steps to Risk-Informed Wellhead Protection and Management: A Case Study. Ground Water, 2014, 52, 161-174.	0.7	16
72	Interactive design of experiments: A priori global versus sequential optimization, revised under changing states of knowledge. Water Resources Research, 2015, 51, 7915-7936.	1.7	15

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73	Studying the integration of solar energy into the operation of a semi-autogenous grinding mill. Part II: Effect of ore hardness variability, geometallurgical modeling and demand side management. Minerals Engineering, 2019, 137, 53-67.	1.8	15
74	Bayesian3 Active Learning for the Gaussian Process Emulator Using Information Theory. Entropy, 2020, 22, 890.	1.1	15
75	A method for implementing Dirichlet and third-type boundary conditions in PTRW simulations. Water Resources Research, 2014, 50, 1374-1395.	1.7	14
76	Bayesian Model Selection Helps To Choose Objectively between Thermodynamic Models: A Demonstration of Selecting a Viscosity Model Based on Entropy Scaling. Industrial & Engineering Chemistry Research, 2016, 55, 10191-10207.	1.8	14
77	Bayesian selection of hydro-morphodynamic models under computational time constraints. Advances in Water Resources, 2018, 117, 53-64.	1.7	14
78	Sensitivity of Simulated Hyporheic Exchange to River Bathymetry: The Steinlach River Test Site. Ground Water, 2019, 57, 378-391.	0.7	14
79	The Connection between Bayesian Inference and Information Theory for Model Selection, Information Gain and Experimental Design. Entropy, 2019, 21, 1081.	1.1	14
80	Optimization for Early-Warning Monitoring Networks in Well Catchments Should Be Multi-objective, Risk-Prioritized and Robust Against Uncertainty. Transport in Porous Media, 2016, 114, 261-281.	1.2	13
81	STakeholder-Objective Risk Model (STORM): Determining the aggregated risk of multiple contaminant hazards in groundwater well catchments. Advances in Water Resources, 2015, 83, 160-175.	1.7	12
82	A stochastically and spatially adaptive parallel scheme for uncertain and nonlinear two-phase flow problems. Computational Geosciences, 2015, 19, 269-284.	1.2	12
83	Studying the integration of solar energy into the operation of a semi-autogenous grinding mill. Part I: Framework, model development and effect of solar irradiance forecasting. Minerals Engineering, 2019, 137, 68-77.	1.8	12
84	Sequential Design of Computer Experiments for the Solution of Bayesian Inverse Problems. SIAM-ASA Journal on Uncertainty Quantification, 2017, 5, 640-664.	1.1	11
85	The Role of Fast Frequency Response of Energy Storage Systems and Renewables for Ensuring Frequency Stability in Future Low-Inertia Power Systems. Sustainability, 2021, 13, 5656.	1.6	11
86	Bayesian inversion of hierarchical geostatistical models using a parallel-tempering sequential Gibbs MCMC. Advances in Water Resources, 2020, 141, 103614.	1.7	11
87	Dispersion on kriged hydraulic conductivity fields. Water Resources Research, 2003, 39, .	1.7	10
88	Integrating Structural Resilience in the Design of Urban Drainage Networks in Flat Areas Using a Simplified Multi-Objective Optimization Framework. Water (Switzerland), 2021, 13, 269.	1.2	10
89	Introduction to the special issue on uncertainty quantification and risk assessment. Advances in Water Resources, 2012, 36, 1-2.	1.7	9
90	Improving temperature predictions for Li-ion batteries: data assimilation with a stochastic extension of a physically-based, thermo-electrochemical model. Journal of Energy Storage, 2017, 12, 288-296.	3.9	9

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91	Reconnecting Stochastic Methods With Hydrogeological Applications: A Utilitarian Uncertainty Analysis and Risk Assessment Approach for the Design of Optimal Monitoring Networks. <i>Water Resources Research</i> , 2018, 54, 2270-2287.	1.7	9
92	Global sensitivity analysis of a CaO/Ca(OH) ₂ thermochemical energy storage model for parametric effect analysis. <i>Applied Energy</i> , 2021, 285, 116456.	5.1	9
93	Bayesian Inversion of Multi-Gaussian Log-Conductivity Fields With Uncertain Hyperparameters: An Extension of Preconditioned Crank-Nicolson Markov Chain Monte Carlo With Parallel Tempering. <i>Water Resources Research</i> , 2021, 57, e2021WR030313.	1.7	9
94	Investigating the pilot point ensemble Kalman filter for geostatistical inversion and data assimilation. <i>Advances in Water Resources</i> , 2021, 155, 104010.	1.7	9
95	Towards Optimizing Experiments for Maximum-confidence Model Selection between Different Soil-plant Models. <i>Procedia Environmental Sciences</i> , 2013, 19, 514-523.	1.3	8
96	Evolution and persistence of cross-directional statistical dependence during finite-Péclet transport through a real porous medium. <i>Water Resources Research</i> , 2016, 52, 8920-8937.	1.7	8
97	Search Space Representation and Reduction Methods to Enhance Multiobjective Water Supply Monitoring Design. <i>Water Resources Research</i> , 2019, 55, 2257-2278.	1.7	8
98	Efficient Discretization-Independent Bayesian Inversion of High-Dimensional Multi-Gaussian Priors Using a Hybrid MCMC. <i>Water Resources Research</i> , 2021, 57, e2021WR030051.	1.7	8
99	Integration of seawater pumped storage and desalination in multi-energy systems planning: The case of copper as a key material for the energy transition. <i>Applied Energy</i> , 2021, 299, 117298.	5.1	8
100	A Multi-objective Optimization Concept for Risk-based Early-warning Monitoring Networks in Well Catchments. <i>Procedia Environmental Sciences</i> , 2015, 25, 191-198.	1.3	7
101	The rocky road to extended simulation frameworks covering uncertainty, inversion, optimization and control. <i>Environmental Modelling and Software</i> , 2017, 93, 180-192.	1.9	7
102	Preconditioned Crank-Nicolson Markov Chain Monte Carlo Coupled With Parallel Tempering: An Efficient Method for Bayesian Inversion of Multi-Gaussian Log-Hydraulic Conductivity Fields. <i>Water Resources Research</i> , 2020, 56, e2020WR027110.	1.7	7
103	Sampling behavioral model parameters for ensemble-based sensitivity analysis using Gaussian process emulation and active subspaces. <i>Stochastic Environmental Research and Risk Assessment</i> , 2020, 34, 1813-1830.	1.9	7
104	Surrogate-based Bayesian comparison of computationally expensive models: application to microbially induced calcite precipitation. <i>Computational Geosciences</i> , 2021, 25, 1899-1917.	1.2	7
105	Diagnosis of Model Errors With a Sliding Time-Window Bayesian Analysis. <i>Water Resources Research</i> , 2022, 58, .	1.7	7
106	Combining Crop Modeling with Remote Sensing Data Using a Particle Filtering Technique to Produce Real-Time Forecasts of Winter Wheat Yields under Uncertain Boundary Conditions. <i>Remote Sensing</i> , 2022, 14, 1360.	1.8	7
107	Should environmental constraints be considered in linear programming based water value calculators?. <i>International Journal of Electrical Power and Energy Systems</i> , 2020, 117, 105662.	3.3	6
108	Forward-reverse switch between density-based and regional sensitivity analysis. <i>Applied Mathematical Modelling</i> , 2020, 84, 377-392.	2.2	6

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109	Integrating transient behavior as a new dimension to WHPA delineation. <i>Advances in Water Resources</i> , 2018, 119, 178-187.	1.7	5
110	Energy storage and transmission systems to save the fish? Minimizing hydropeaking for little extra cost. <i>Sustainable Energy Technologies and Assessments</i> , 2019, 35, 41-47.	1.7	5
111	Trajectories as Training Images to Simulate Advective&Diffusive, Non&Fickian Transport. <i>Water Resources Research</i> , 2019, 55, 3465-3480.	1.7	5
112	Evaluating Subsurface Parameterization to Simulate Hyporheic Exchange: The Steinlach River Test Site. <i>Ground Water</i> , 2020, 58, 93-109.	0.7	5
113	Improving Thermochemical Energy Storage Dynamics Forecast with Physics-Inspired Neural Network Architecture. <i>Energies</i> , 2020, 13, 3873.	1.6	5
114	Bayesian Model Weighting: The Many Faces of Model Averaging. <i>Water (Switzerland)</i> , 2020, 12, 309.	1.2	5
115	Lumped geohydrological modelling for long-term predictions of groundwater storage and depletion. <i>Journal of Hydrology</i> , 2022, 606, 127347.	2.3	5
116	Dynamic re-distribution of pumping rates in well fields to counter transient problems in groundwater production. <i>Groundwater for Sustainable Development</i> , 2019, 8, 606-616.	2.3	4
117	Reliability sensitivity analysis with subset simulation: application to a carbon dioxide storage problem. <i>IOP Conference Series: Materials Science and Engineering</i> , 2019, 615, 012051.	0.3	4
118	Strategies for Simplifying Reactive Transport Models: A Bayesian Model Comparison. <i>Water Resources Research</i> , 2020, 56, e2020WR028100.	1.7	3
119	Characterization of Export Regimes in Concentration&Discharge Plots via an Advanced Time-Series Model and Event-Based Sampling Strategies. <i>Water (Switzerland)</i> , 2021, 13, 1723.	1.2	3
120	Resampling method for reliability-based design optimization based on thermodynamic integration and parallel tempering. <i>Mechanical Systems and Signal Processing</i> , 2021, 156, 107630.	4.4	3
121	How Do Fractures Influence Hyporheic Exchange in Sedimentary Rock Riverbeds?. <i>Water Resources Research</i> , 2021, 57, e2020WR028476.	1.7	3
122	The Four Ways to Consider Measurement Noise in Bayesian Model Selection &And Which One to Choose. <i>Water Resources Research</i> , 2021, 57, e2021WR030391.	1.7	3
123	Predicting the battery core temperature: Explanatory power of measurement quantities under different uncertainty scenarios. <i>Journal of Energy Storage</i> , 2018, 18, 476-484.	3.9	2
124	A Graph-Theory Based Algorithm to Generate Decentralized Urban Drainage Layouts. <i>Green Energy and Technology</i> , 2019, , 633-637.	0.4	2
125	Joint Optimization of Measurement and Modeling Strategies With Application to Radial Flow in Stratified Aquifers. <i>Water Resources Research</i> , 2020, 56, e2019WR026872.	1.7	2
126	Exploratory-Phase-Free Estimation of GP Hyperparameters in Sequential Design Methods&At the Example of Bayesian Inverse Problems. <i>Frontiers in Artificial Intelligence</i> , 2020, 3, 52.	2.0	2

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127	Overcoming the Modelâ€Dataâ€Fit Problem in Porous Media: A Quantitative Method to Compare Invasionâ€Percolation Models to Highâ€Resolution Data. <i>Water Resources Research</i> , 2021, 57, e2021WR029986.	1.7	2
128	A Stochastic Framework to Optimize Monitoring Strategies for Delineating Groundwater Divides. <i>Frontiers in Earth Science</i> , 0, 8, .	0.8	2
129	Diagnosing similarities in probabilistic multi-model ensembles: an application to soilâ€plant-growth-modeling. <i>Modeling Earth Systems and Environment</i> , 0, , .	1.9	2
130	Sequential Design of Computer Experiments for the Computation of Bayesian Model Evidence. <i>SIAM-ASA Journal on Uncertainty Quantification</i> , 2021, 9, 260-279.	1.1	1
131	Optimal design of experiments to improve the characterisation of atrazine degradation pathways in soil. <i>European Journal of Soil Science</i> , 2022, 73, .	1.8	1
132	Optimization-based clustering of random fields for computationally efficient and goal-oriented uncertainty quantification: Concept and demonstration for delineation of wellhead protection areas in transient aquifers. <i>Advances in Water Resources</i> , 2022, 162, 104146.	1.7	1
133	Optimal Exposure Time in Gamma-Ray Attenuation Experiments for Monitoring Time-Dependent Densities. <i>Transport in Porous Media</i> , 0, , 1.	1.2	0