Douglas W. Nychka

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Education

1978 B.A. Mathematics and Physics, Duke University
1983 Ph.D. Statistics, University of Wisconsin - Madison

Honors and Awards

1978 *Summa cum laude*, Duke University
1978 Julia Dale Mathematics Award Duke University
2003 Fellow, American Statistical Association
2004 Jerry Sacks Award for Multidisciplinary Research
2013 Distinguished Achievement Award ENVR Section American Statistical Association
2013 Achievement Award, International Statistics and Climatology Meeting
2015 Fellow, Institute of Mathematical Statistics

Professional Appointments

8/2018 - present **Professor**, Applied Mathematics and Statistics, Colorado School of Mines, Golden, CO

8/1997 - present National Center for Atmospheric Research (NCAR), Boulder, CO.
Visiting Scientist (8/97-7/99),
Senior Scientist (8/99 - 8/18),
Project Leader (8/99 - 9/04) Geophysical Statistics Project,
Director (10/04 - 2017), Institute for Mathematics Applied to Geosciences (IMAGe)
Senior Scientist Emeritus (8/18 - present)

7/1983 - 6/1999 Statistics, North Carolina State University, Raleigh, NC
Assistant (7/83 - 6/89),
Associate (7/89 - 6/94)
Full Professor (7/94 - 7/99),

Teaching History

(† indicates a new or substantially revised course.)

F18, F19	Applied and Computational Linear Algebra †	AMS498
S19, F22	Functional Data Analysis†	AMS498/598
F19, S20	Introduction to Probabilty	AMS334
F20,F22, F23,F24	Spatial Statistics†	AMS432/532
S20, S21, S22	Introduction to Environmental Data Science with R†	AMS398
S21, S22, S23, F23, F24	Advanced Statistics†	AMS436/536
F21	Introduction to Statistical Methods	MATH530 (online)
S22	Computational Linear Algebra	MATH551
S23	Theory of Linear Models†	MATH531

Advising, mentoring, and committee memberships

Within AMS:
ZyLu Li, AMS PhD current (adivsor)
Antony Sikorski, AMS Ph D current (co advisor)

Sweta Rai, AMS Ph D current (advisor)
Matthew Hofkis, AMS Ph D 2024 (advisor)
Laura Albrecht, AMS Ph D 2024 (advisor)
Juliette Mukangango, AMS Ph D 2024 (co advisor)
Vivkek Pradhan, AMS Ph D 2024 (co advisor)
Maggie Bailey, AMS Ph D 2024 (co advisor)
William Daniels, AMS Ph D 2024 (member)
Lewis Blake, AMS/Ph D 2021 (member)

Maggie Bailey, AMS/ Masters 2021 (co advisor)
William Daniels, AMS/Masters 2021 (committee)
Dani Barna, AMS/Masters 2019 (advisor)

Membership for other departments:
Arielle Koshkin, Hydrology/Ph D current
Daniel Phillipus, Hydrology/Ph D current
Jihyun Yang, Geophysics/Ph D 2023
Wilson Sauthoff, Geophysics/Ph D current
Alexander Gonzalez, Additive Manufacting/ Ph D current
Reynaldo Vite Sanchez, Geophysics/Ph D current
Hayden Jacobson, Geology/Ph D current

External Advising:
Collette Smirniotis, San Diego State University, May 2018, (thesis advisor) (UC-Davis Health)
Ashton Weins, University of Colorado, May 2020, (co-advisor) (USGS)
Postdoctoral mentoring:
Florian Gerber 2019 - 2021 (Universitait Zurich, IKEA)
Hannah Director 2019 - 2022 (Health New Zealand)
David John Gagne 2016-2018 (co-mentor) (NCAR)

Professional service

Restricted to activities since joining Colorado School of Mines in 2018

School of Mines

- Director, Data Science Program (2018 –2023, 2024 - present)
- Member and Chair, University Promotion and Tenure Committee (2021 – 2024)
- Chair, AMS Targeted Search (2023)
- Member, AMS Head Search Committee (2021-2022)
- Member, Advanced and Additive Manufacturing Cluster Search (2020–2021)
- Member, AMS Graduate Committee (2020 – 2022)
- Member, AMS Undergraduate Committee (2022 – present)
- Schools of Mines COVID task force (2020 – 2021)
- Co-organizer AMS summer bootcamp (2020)

External Service (since 2018)

- Member, (2021 - present) CALDERA Scientific Advisory Board, Sandia National Laboratory, NM.
- Co-Organizer (2020-present), Spatial Statistics 2023: Climate and the Environment, Boulder, CO.
- Program Co-Chair (2021- 2022) SIAM UQ22, Atlanta, April, 2022

- Member (2019- 2020) and Chair (2020 – 2022) , Gottfried E. Noether Awards Committee, American Statistical Association
- Member (2015 – 2018, 2021) and Chair (2018 – 2020) Scientific Review Panel, Pacific Institute of Mathematical Sciences (PIMS), Vancouver, Canada
- Member (2015 – 2021) Scientific Advisory Committee, Canadian Statistical Sciences Institute (CANSSI)
- Member (2019 – 2020) and Chair (2021) EVNR Distinguished Achievement Award Committee, American Statistical Association
- NSF review panel IUSE Data Science. October 2020
- Member, Program Committee, Mathematical and Statistical Methods for Climate and the Earth System, Statistics and Applied Mathematical Sciences Institute, (2017 – 2018)
- Member, Scientific Advisory Board, European Union Surface Temperature for All Corners of Earth (EUSTACE), (2015 –2019)

Research products

Douglas Nychka's areas of research include the theory, computation and application of curve and surface fitting with a focus on geophysical and environmental problems. He is an author on more than 108 peer-reveiwed articles (see last sections) and has edited two books. Google scholar reports an h-index 52 and an i10-index 103 based on 14000+ citations (December, 2024) . He has given more than 120 invited talks based on his research since 2012 and his R software for spatial data analysis has 450K+ downloads for 2024.

Software

Nychka, D., Hammerling, D., Sain, S. Lenssen, N. and Smirniotis, C. (2011-present). LatticeKrig: Multiresolution Kriging based on Markov random fields
`http://cran.r-project.org/web/packages/LatticeKrig`

Nychka, D., Furrer, R., Paige, J., and Sain, S. (2000-present). fields: Tools for Spatial Data
`http://cran.r-project.org/web/packages/fields`

Package download totals (since 2018) by year from `cran-logs.rstudio.com`

	2018	2019	2020	2021	2022	2023	2024
`fields`	269641	423899	457920	510753	444278	421950	453018
`LatticeKrig`	3863	7546	15288	19191	7963	4689	5521

Grants and Contracts (awards since 2018)

- NSF DMS: Collaborative Research: CAS-Climate: Prediction and uncertainty quantification of non-Gaussian spatial processes with applications to large-scale flooding in urban areas 09/2023 - 09/2025 $364,581 (co PI)
- NREL Subcontract: High-Resolution Long-term Weather Data for Energy 10/2021 - 9/2024 $268,146 (co PI)
- NSF: Collaborative Research: Modernizing Water and Wastewater Treatment through Data Science Education & Research 10/01/2019 - 2022, $1,157,928 (co PI)
- NSF DMS: Scalable Statistical Validation and Uncertainty Quantification for Large Spatio-Temporal Datasets 2015 - 2018 $75,090 (PI)

Invited presentations

Invited talks, seminars and short courses with approximate audience size ( ).
($\star$) A special invited address

- **2024**
  The evolution of computing spatial models.
  Spatial Data Science for the Environment, Boulder, CO, October 2024 (40)

  Complex Environmental Problems and Deep Learning
  Joint Statistical Meetings, Portland, OR, August 2024 (30)

  Hybrid L1/L2 Smoothing
  University of Colorado Health Sciences, Denver, CO, April 2024 (20)
  Texas A&M University, College Station, TX, April 2024 (40)
  Cornell University, Ithaca, NY, September, 2024 (25)

  Statistical science for understanding climate and the Earth system
  Two week summer school by the University of Bocconi, Lake Como, IT, July, 2024 (35)

- **2023**
  Hybrid L1/L2 Smoothing
  University of Wisconsin-Madison, Madison, WI, November 2023, (35)
  CMStatistics, Berlin, DE, December 2023 (30)

  Regridding Uncertainty for Statistical Downscaling of Solar Radiation
  Joint Meetings American Statistical Association, Toronto CA, August 2023 (50)

  Spatial statistics beyond the textbook
  US Census, July, 2023 (10)

  Gaussian process models for large spatial data.
  Institute of Mathematics of Granada (IMAG), Granada, Spain, May 2023 (30)

  Fast methods for conditional simulation, the key to spatial inference
  International Indian Statistical Association, Golden, CO, June, 2023 (120) ($\star$)
  Spatial Statistics 2023: Climate and the Environment, Boulder, CO, July 2023 (45)
  New Mexico Statistics Chapter Meeting, Santa Fe, NM, September, 2023 (50) ($\star$)
  EnviBayes Workshop on Complex Environmental Data, Fort Collins, CO September 2023, (50)

- **2022**
  Spatial Statistics and applications of deep learning
  SIAM UQ2022, Atlanta, April 2022 (30)

  Fast computation for Gaussian Processes
  Institute for Mathematical and Statistical Innovation, Chicago, August 2022 (40)
  Washington University, St Louis, November, 2022 (20)

  Using climate models for impacts: sea ice and solar radiation
  Institute for Mathematical and Statistical Innovation, Chicago, September 2022 (40)
  Washington University, St Louis, November, 2022 (20)

  Grace Wahba's contributions to climate science
  Institute of Mathematical Statistics Annual Meeting, July 2022, London, UK (40)

  Multivariate spatial models
  Joint Statistical Meetings,August 2022, Washington DC, (50)

- 2021
  Spatial Statistics and applications of deep learning
  SIAM Conference on Computational Science and Engineering (CSE21), March 2021 (virtual)
  Texas A&M , April 2021, (25) (virtual)
  Joint Statistical Meetings, August 2021, (40) (virtual)

CU - Boulder, CO, September, 2021, (30)
UC - Santa Cruz, September, 2021, (30) (virtual)
Carnegie Mellon, STAMPS, October, 2021, (40)
SSC21 (Supercomputing), November 2021, (30) (virtual)

Spatial Statistical Learning
ISI 63rd World Congress, Short Course, May 2021, 3 Lectures, (30)

($\star$) *Climate research at SAMSI*
Durham, NC, August 2021 (50)

- 2020
($\star$) *The Earth's climate, a computer model, and a data scientist*,
John A Lynch Lecture Series, University of Notre Dame, February, 2020, (60).

Non-stationary spatial data: think globally act locally,
Statistics Department Seminar, UC Santa Barbara, April, 2020 (20).

Learning a stationary covariance function,
Texas A&M , April 2021, (25)
Joint Statistical Meetings, (virtual) August 2020, (40).
Kernel Klub, AMS, Mines, September 2020 (15)

- 2019
($\star$) *Spatial data and the work of Grace Wahba* ,
Krishnaiah Memorial Lecture, Pennsylyvania State University, May, 2019 (50)

($\star$) *Graduation Address to the Mathematics and Statistics Undergraduates*,
University of Illinois, May, 2019 This address was to approximately 1000 students, parents and faculty.

Nonstationary Spatial Data: Think Globally Act Locally,
Joint Statistical Meetings, Denver, August 2019 (40)
Department of Statistics, Simon Fraser University, Vancouver, Canada, October, 2019. (35)

- 2018

Statistical methods for nonstationary spatial data
International Environmetrics Society, Guanajuato, MX, July 2018
Joint Statistical Meetings, Vancouver, BC, August 2018

($\star$) *Data Science and Climate*
Alan Turing Institute, London, UK, March 2018 (45)

An introduction to climate
October 2018, SAMSI, Research Triangle Park, NC (50)
May 2018, SAMSI, Research Triangle Park, NC (50)

Large and non-stationary spatial fields: Quantifying uncertainty in climate models
Hadley Center, Exeter, UK, (30), March 2018
University of Minnesota (50) , May 2018,
Symposium on Data Science and Statistics, Reston, VA, May 2018

- 2017

Large and non-stationary spatial fields: Quantifying uncertainty in climate models
October 2017, North Carolina State University (40)
October 2017, Argonne National Laboratory (35)

Pattern Scaling of Climate Models
November 2017, KAUST, Saudi Arabia (30)

HPC4Stats, Data analysis in R using High Performance Computing
August 2017, SAMSI, Research Triangle Park, NC (50)

Pattern Scaling of Climate Models
July 2017, Data Science and the Environment, Brest, FR (60)
July 2017, University of Lancaster, UK (60)
September 2017, Colorado School of Mines (30)

Estimating Curves and Surface
April 2017, University of Maryland-Baltimore Campus, (60) 4 lectures

($\star$) *Spatial statistics*
May 2017, University of Fudan, Shanghai, PRC, (35) 9 Lectures

Multi-resolution spatial methods: LatticeKrig
April 2017, CSU, (45)

- 2016

Regional Climate and Extremes
October 2016, STATMOS Workshop on Extremes, College Station, PA (35)

($\star$) *Environmental Statistics at NCSU*
October 2016, 75th Anniversary Department of Statistics, North Carolina State University, Raleigh, NC (70)

Solving Inverse Problems
October 2016, Reed College, (45)

Spatial Statistics
July 2016, Environmental Analytics, NCAR (2 Lectures) (30)
July 2016, Regional Climate Tutorial, NCAR (MMM) (60)
April 2016, Colorado School of Mines, Golden (25)
June 2016, R Bootcamp , NCAR (10)

Multi-resolution spatial methods: LatticeKrig
March 2016, Arizona State University, Tempe, AZ (40)
March 2016, ETH and University Zurich, Zurich, CH (40)

Hierarchical Models
July 2016, Beyond P-values, NCAR (25)

Regional Climate and Extremes
April 2016, Theme-of-the-Year, NCAR, Boulder (45)
June 2016, BIRS, Banff, CA (30)
September 2016, Climate Informatics, NCAR (60)

Pattern Scaling of Climate Models
June 2016, 13th International Statistics and Climate Conference, Canmore , CA (60)

Are Climate Models Built Using Statistics?
August 2016, Joint Meetings American Statistical Association, Chicago, (60)

Data analysis for extremes
August 2016, Tutorial CMIP5 Analysis Platform, NCAR (45) 2 Lectures

- 2015

Multi-resolution spatial methods: LatticeKrig
October 2015, KAUST, Saudi Arabia, (25)
November 2015, Big Data and the Environment, Buenos Aires (50)

Asymptotic theory for spatial methods
June 2015, Aalborg University, Aalborg, Denmark (30)

HPC4Stats
September, 2015, STATMOS short course, University of Michigan, (25)

Pattern Scaling of climate models
June 2016, 13th International Statistics and Climate Conference, Canmore, CA

April 2015, University of Indiana (20)
June 2015, Summer Research Conference on Statistics, Carolina Beach, NC (50)
July 2015, Joint Statistical Meetings, Seattle (60)
August 2015, University of Colorado-Denver, (25)
September 2015, Colorado School of Mines, (25)

Regional climate informatics
January 2015, Seismometrics, Valparaiso, Chile (50)

Spatial Statistics
March 2015, Indian Statistical Institute, Kolkata,IN (2 Lectures) (30)
July 2015, Data Analytics for Ecologists, NCAR (25)
July 2015, Regional Climate Short Course, NCAR (50)

A Statistical Excursion with DART
May 2015, STATMOS/Data Assimilation Short Course NCAR (20)

Bayesian Hierarchical Models
April 2015, University of Indiana (20)

Regional Climate and Extremes
May 2015, Pacific Institute of Mathematics, Vancouver, (40)
June 2015, BIRS, Banff, Alberta, (30)

- 2012 – 2014
Uncertain Weather, Uncertain Climate
October 2014, University British Columbia, Vancouver, CA (50)

Statistical inference for spatial data
November 2014, University of Kansas, Lawrence, KA (45)

What would a statistician do with 10 seconds on a super computer?
November 2014, University of Kansas, Lawrence, KA (45)

Multi-resolution spatial methods: LatticeKrig
October, 2014, University of British Columbia, Vancouver, CA (45)
November 2014, Michigan State University, E. Lansing, MI (45)

DART and Ocean Data Assimilation
October 2013, Role of the Oceans in Climate Uncertainty, BIRS, Banff, Alberta, CA (30)

Uncertain Weather, Uncertain Climate
October 2013, Department of Statistics, Brigham Young University, Provo, UT (60)

Regional Climate past, present and future
November 2013, Royal Statistical Society and the American Statistical Association, London, UK (75)

Regional Climate, Extremes and Spatial Data
February, 2014, AAAS meeting, Chicago (10)

Multi-Resolution Spatial Methods for Large Data Sets
November 2013, Exeter University, Exeter UK, (45)
November 2013, CISL Work in Progress (30)

February 2014, University of Chicago, Chicago, IL (35)
February 2014, Harvard University, Boston, MA (30)
April 2014, SIAM/ASA Uncertainty Quantification, Savannah, GA, (4 Lectures) (45)
April 2014, National Science Foundation, Arlington, VA (30)
May 2014, University of Glasgow, Scotland, UK (35)
June 2014, Conference on Nonparametric Statistics for Big Data and Celebration to Honor Professor Grace Wahba, Madison, WI

Uncertain Weather, Uncertain Climate
May 2014, University of Glasgow, Scotland, (35)

Estimating Curves and Surfaces (4 Lectures)
March 2014, KAUST, Saudi Arabia (45)

Statistical inference for spatial data
July 2014, SAMSI/IMAGe Summer Program: The International Surface Temperature Initiative

Reconstructing CO2 for the past 2000 years
August 2014, Joint Statistical Meetings, Boston, MA (20) (Invited poster session)

What would a statistician do with 10 seconds on a super computer?
August 2014, Joint Statistical Meetings, Boston, MA (50)

Multi-Resolution Spatial Methods for Large Data Sets
October 2012, U Arizona, Tucson, AZ (60)
December 2012, Stanford U, Palo Alto, CA (40)
February 2013, SAMSI Large Datasets, NCAR (50)
March 2013, Iowa State U, Ames, IA, (60)
May 2013, SIAM Data Mining Conference, Austin, TX (100)
June 2013, International Meeting on Statistics and Climatology, Jeju, South Korea (75)
July 2013 NSF Expeditions Workshop, Evanston, IL (40)
September 2013, Third Workshop on Bayesian Inference for Latent Gaussian Models, Reykavik, Iceland (60)

Statistical Methods for Nonstationary Spatial Data
December 2012, American Geophysical Union, San Francisco, CA (75)
June 2013, International Meeting on Statistics and Climate, Jeju, South Korea (50)
August 2013, American Statistical Association Annual Meeting, Montreal, CA (75)

Uncertain Weather, Uncertain Climate
March 2013, Invited University Lecture, U Toronto, CA (60)
October 2013, Department of Statistics, Brigham Young University, Provo, UT (60)

Peer-reviewed journal publications (since 2018).

18. Rai, S., Hoffman, A., Lahiri, S., Nychka, D. W., Sain, S. R., and Bandyopadhyay, S. (2024). Fast parameter estimation of generalized extreme value distribution using neural networks. *Environmetrics*, 35(3):e2845

17. Bailey, M. D., Nychka, D., Sengupta, M., Habte, A., Xie, Y., and Bandyopadhyay, S. (2023). Regridding uncertainty for statistical downscaling of solar radiation. *Advances in Statistical Climatology, Meteorology and Oceanography*, 9(2):103–120

16. Garrish, J., Chan, C., Nychka, D., and Diniz Behn, C. (2023). A gaussian process model for insulin secretion reconstruction with uncertainty quantification: Applications in cystic fibrosis. *SIAM Journal on Applied Mathematics*, pages S65–S81

15. Durell, L., Scott, J. T., Nychka, D., and Hering, A. S. (2022). Functional forecasting of dissolved oxygen in high-frequency vertical lake profiles. *Environmetrics*, page e2765

14. Bailey, M. D., Bandyopadhyay, S., and Nychka, D. W. (2022). Adapting conditional simulation using circulant embedding for irregularly spaced spatial data. *Stat*, 11(1):e446

13. Gerber, F. and Nychka, D. (2021a). Fast covariance parameter estimation of spatial Gaussian process models using neural networks. *Stat*, 10(1):e382

12. Ilyas, M., Nychka, D., Brierley, C., and Guillas, S. (2021). Global ensemble of temperatures over 1850-2018: quantification of uncertainties in observations, coverage, and spatial modeling (GETQUOCS). *Atmospheric Measurement Techniques*, 14(11):7103–7121

11. Gerber, F. and Nychka, D. W. (2021b). Parallel cross-validation: A scalable fitting method for Gaussian process models. *Computational Statistics & Data Analysis*, 155:107113

10. Wiens, A., Kleiber, W., Nychka, D., and Barnhart, K. R. (2021). Nonrigid registration using Gaussian processes and local likelihood estimation. *Mathematical Geosciences*

9. Porcu, E., Furrer, R., and Nychka, D. (2021). 30 years of space–time covariance functions. *Wiley Interdisciplinary Reviews: Computational Statistics*, 13(2):e1512

8. Wiens, A., Nychka, D., and Kleiber, W. (2020). Modeling spatial data using local likelihood estimation and a Matèrn to SAR translation. *Environmetrics*, 31(6)

7. Simonson, P., Nychka, D., and Bandyopadhyay, S. (2020). Rapid numerical approximation method for integrated covariance functions over irregular data regions. *Stat*, 9(1):e275

6. Huang, W. K., Nychka, D. W., and Zhang, H. (2019). Estimating precipitation extremes using the log-histospline. *Environmetrics*, 30(4):e2543

5. Heaton, M. J., Datta, A., Finley, A. O., Furrer, R., Guinness, J., Guhaniyogi, R., Gerber, F., Gramacy, R. B., Hammerling, D., Katzfuss, M., et al. (2019). A case study competition among methods for analyzing large spatial data. *Journal of Agricultural, Biological and Environmental Statistics*, 24(3):398–425

4. Dalmasse, K., Savcheva, A., Gibson, S., Fan, Y., Nychka, D., Flyer, N., Mathews, N., and DeLuca, E. (2019). Data-optimized coronal field model. i. proof of concept. *The Astrophysical Journal*, 877(2):111

3. Gagne II, D. J., Haupt, S. E., Nychka, D. W., and Thompson, G. (2019). Interpretable deep learning for spatial analysis of severe hailstorms. *Monthly Weather Review*, 147(8):2827–2845

2. Nychka, D., Hammerling, D., Krock, M., and Wiens, A. (2018). Modeling and emulation of nonstationary Gaussian fields. *Spatial statistics*, 28:21–38

1. Pazdernik, K., Maitra, R., Nychka, D., and Sain, S. (2018). Reduced basis kriging for big spatial fields. *Sankhya A*, pages 1–21

Manuscripts in review

1. Hofkes, M. and Nychka, D. (2024). Hybrid smoothing for anomaly detection in time series. *arXiv preprint arXiv:2402.03459* (in review *Technometrics*)

2. Pradhan, V., Nychka, D., and Bandyopadhyay, S. (2023). Beyond the odds: Fitting logistic regression with missing data in small samples. *manuscript* (in review *American Statistician*)

Peer-reviewed journal publications (before 2018).

90. Alexeeff, S. E., Nychka, D., Sain, S. R., and Tebaldi, C. (2016a). Emulating mean patterns and variability of temperature across and within scenarios in anthropogenic climate change experiments. *Climatic Change*, pages 1–15

89. Anderson, A. N., Browning, J. M., Comeaux, J., Hering, A. S., and Nychka, D. (2016). A comparison of automated statistical quality control methods for error detection in historical radiosonde temperatures. *International Journal of Climatology*, 36(1):28–42

88. Dalmasse, K., Nychka, D., Gibson, S., Fan, Y., and Flyer, N. (2016). Roam: a radial basis function optimization approximation method for diagnosing the three-dimensional coronal magnetic field. *Frontiers in Astronomy and Space Sciences*, 3

87. Alexeeff, S. E., Pfister, G. G., and Nychka, D. (2016b). A Bayesian model for quantifying the change in mortality associated with future ozone exposures under climate change. *Biometrics*, 72(1):281–288

86. Tolwinski-Ward, S., Tingley, M., Evans, M., Hughes, M., and Nychka, D. (2015). Probabilistic reconstructions of local temperature and soil moisture from tree-ring data with potentially time-varying climatic response. *Climate dynamics*, 44(3-4):791–806

85. Kleiber, W. and Nychka, D. W. (2015). Equivalent kriging. *Spatial Statistics*, 12:31–49

84. Nychka, D., Bandyopadhyay, S., Hammerling, D., Lindgren, F., and Sain, S. (2015). A multi-resolution Gaussian process model for the analysis of large spatial datasets. *Journal of Computational and Graphical Statistics*, 24(2):579–599

83. Heaton, M., Katzfuss, M., Berrett, C., and Nychka, D. (2014). Constructing valid spatial processes on the sphere using kernel convolutions. *Environmetrics*, 25(1):2–15

82. Lombardozzi, D., Bonan, G. B., and Nychka, D. W. (2014). The emerging anthropogenic signal in land-atmosphere carbon-cycle coupling. *Nature Climate Change*, 4(9):796

81. Anderes, E., Huser, R., Nychka, D., and Coram, M. (2013). Nonstationary positive definite tapering on the plane. *Journal of Computational and Graphical Statistics*, 22(4):848–865

80. Kleiber, W. and Nychka, D. (2012). Nonstationary modeling for multivariate spatial processes. *Journal of Multivariate Analysis*, 112:76–91

79. Sun, Y., Genton, M. G., and Nychka, D. W. (2012). Exact fast computation of band depth for large functional datasets: How quickly can one million curves be ranked? *Stat*, 1(1):68–74

78. Benestad, R. E., Nychka, D., and Mearns, L. O. (2012b). Specification of wet-day daily rainfall quantiles from the mean value. *Tellus A: Dynamic Meteorology and Oceanography*, 64(1):14981

77. Benestad, R., Nychka, D., and Mearns, L. (2012a). Spatially and temporally consistent prediction of heavy precipitation from mean values. *Nature Climate Change*, 2(7):544

76. Sain, S. R., Nychka, D., and Mearns, L. (2011). Functional anova and regional climate experiments: A statistical analysis of dynamic downscaling. *Environmetrics*, 22(6):700–711

75. Oh, H.-S., Lee, T. C., and Nychka, D. W. (2011). Fast nonparametric quantile regression with arbitrary smoothing methods. *Journal of Computational and Graphical Statistics*, 20(2):510–526

74. Matsuo, T., Nychka, D. W., and Paul, D. (2011). Nonstationary covariance modeling for incomplete data: Monte Carlo EM approach. *Computational Statistics & Data Analysis*, 55(6):2059–2073

73. Winter, C. and Nychka, D. (2010). Forecasting skill of model averages. *Stochastic environmental research and risk assessment*, 24(5):633–638

72. Li, B., Nychka, D. W., and Ammann, C. M. (2010). The value of multiproxy reconstruction of past climate. *Journal of the American Statistical Association*, 105(491):883–895

71. Smith, R. L., Tebaldi, C., Nychka, D., and Mearns, L. O. (2009). Bayesian modeling of uncertainty in ensembles of climate models. *Journal of the American Statistical Association*, 104(485):97–116

70. Storlie, C. B., Lee, T. C., Hannig, J., and Nychka, D. (2009). Tracking of multiple merging and splitting targets: A statistical perspective. *Statistica Sinica*, pages 1–31

69. Lankao, P. R., Tribbia, J. L., and Nychka, D. (2009). Testing theories to explore the drivers of cities' atmospheric emissions. *AMBIO: A Journal of the Human Environment*, 38(4):236–244

68. Whitcher, B., Lee, T., Weiss, J. B., Hoar, T. J., and Nychka, D. W. (2008). A multi-resolution census algorithm for calculating vortex statistics in turbulent flows. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 57(3):293–312

67. Santer, B. D., Thorne, P., Haimberger, L., Taylor, K. E., Wigley, T., Lanzante, J., Solomon, S., Free, M., Gleckler, P. J., Jones, P., et al. (2008). Consistency of modelled and observed temperature trends in the tropical troposphere. *International Journal of Climatology*, 28(13):1703–1722

66. Lankao, P. R., Nychka, D., and Tribbia, J. L. (2008). Development and greenhouse gas emissions deviate from the'modernization'theory and'convergence'hypothesis. *Climate Research*, 38(1):17–29

65. Malmberg, A., Arellano, A., Edwards, D. P., Flyer, N., Nychka, D., and Wikle, C. (2008). Interpolating fields of carbon monoxide data using a hybrid statistical-physical model. *The Annals of Applied Statistics*, pages 1231–1248

64. Khare, S. P., Anderson, J. L., Hoar, T. J., and Nychka, D. (2008). An investigation into the application of an ensemble kalman smoother to high-dimensional geophysical systems. *Tellus A*, 60(1):97–112

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