Curriculum vitae
Bob (Bote) Willem Kooi
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ResearcherID B-6343-2012

General Sex: male. Status: married with Petra van Egmond and we have one son called Derk. Nationality: Dutch. Hobbies: Archery.

20 febr 1950 Date of birth in Uithuizermeeden, Prov. Groningen, The Netherlands.

Aug 1973- March 1979 Study Mathematics at University of Groningen Specialization: Applied Mechanics, Computer Science and Numerical Analysis.

  March '79 Masters degree (ingenieurs examen Technische Mechanica).

March 1979- March 1983 PhD student employed by the Netherlands Organization for Pure Scientific Research (ZWO) at the Mathematical Institute, University of Groningen.

  March 1983 Ph-Degree, title thesis: "On the Mechanics of the Bow and Arrow", promotor prof. dr. J.A. Sparenberg (Applied Mathematics, University of Groningen), referees prof. ir. M. Kuipers (Applied Mechanics, University of Groningen) and prof. dr. ir. J.G. Lekkerkerker (Applied Mechanics, Technical University Delft).

Aug 1983-May 1988 Research worker at Fokker, Space & Systems Amsterdam, cq. Division of Structural Analysis (now Dutch Space). Main field of activity: Structural Analysis of satellites and appendices such as solar arrays. Thermal-Structural interactions, Fluid-Structural interactions, Test-Analysis Correlation, Modal Survey Analysis.

May 1988-June 2009 Assistant-Professor Dept. Theoretical Biology, Vrije Universiteit, Amsterdam, The Netherlands;

Jan 1999- May 1999 Visiting-Professor Dept. Ecology & Evolutionary Biology and Dept. Mathematics, University of Tennessee, Knoxville TN 37996 USA; My host was Prof. Dr. T.G. Hallam.

June 2009-present Associate-Professor Dept. Theoretical Biology, Vrije Universiteit, Amsterdam, The Netherlands;

side activities (list is not exhaustive)

1996-2001 Coordinator of the National Program on Massive Parallel Processing, cluster Biological Application (NWO).

2001-2005 President of the NVTB (Nederlandse Vereniging voor Theoretische Biologie) Dutch Society of Theoretical Biology `http://www.bio.vu.nl/nvtb/`.

1991-present Founding member of European Society for Mathematical and Theoretical Biology (ESMTB)

co-promotor

C.H. Ratsak. Grazer induced sludge reduction in wastewater treatment, 1994
M.P. Boer. The dynamics of tri-trophic food chains, 2000
L.D.J. Kuijper. The role of trophic flows in food web dynamics, 2004
T. Troost. Evolution of community metabolism, 2006
G.A.K. van Voorn. Ecological implications of global bifurcations, 2009
D. Stiefs. (Oldenburg Germany) Relating generalized and specific modeling in population dynamical systems, 2009
J. Bruggeman. Succession in plankton communities: A trait-based perspective, 2009
D. Bontje. Analysis of toxic effects and nutrient stress in aquatic ecosystems, 2010
Maira Aguiar Freire dos Santos. Rich dynamics in multi-strain models: non-linear dynamics and deterministic chaos in dengue fever epidemiology, 2012
Daniël Jakob Gerla. Positive feedback in species communities

interests My main research interests are the use of mathematical models to help solve problems in Ecology and Epidemiology. Research emphasis is on application of bifurcation theory for the analysis mathematical models based on processes and mechanisms at lower levels of organization, such as the individual, to solve problems at higher levels, such as populations and ecosystems. Topics of special interest are the role of interactions between populations, such as predator-prey interaction, disease transmission, inducible defence mechanisms and competition on ecosystem structure and functioning.

Publications by B.W. Kooi

2004–2016

see Google Scolar for a complete list.

Kooi, B.W., Kuijper, L.D.J. & Kooijman, S.A.L.M. 2004. Consequences of symbiosis for food web dynamics, *Journal of Mathematical Biology*, 49(3):227-271.

Kooijman, S.A.L.M., Andersen, T. & Kooi, B.W. 2004. Dynamic energy budget representations of stoichiometric constraints on population dynamics. *Ecology*, 85(5):1230-1243

Vos, M., Kooi, B.W., Mooij, W.M. & DeAngelis, D.L. 2004 Inducible defences and the paradox of enrichment, *OIKOS*, 105(3): 471-480.

Vos, M., Verschoor, A.M., Kooi, B.W., Wäckers, F.L., DeAngelis, D.L. & Mooij, W.M. 2004. Inducible defenses and trophic structure. *Ecology*, 85(10):2783-2794

S.A.L.M. Kooijman, Jager, T. & B.W. Kooi. 2004 The relationship between elimination rates and partition coefficients of chemical compounds. *Chemosphere*, 57:745-753.

Kuijper, L.D.J., Kooi, B.W., Anderson, T.R. & Kooijman, S.A.L.M. 2004. Stoichiometry and food chain dynamics. *Theoretical Population Biology* 66:323-339.

Reijenga, K.A., Megen, Y.M.G.A. van, Kooi, B.W., Bakker, B.M., Snoep, J.L., Verseveld, H.W. van & Westerhoff, H.V. 2005. Yeast glycolytic oscillations that are not controlled by a single oscillophore: A new definition of oscillophore strength. *Journal of Theoretical Biology*, 232:385-398.

Troost, T.A., Kooi, B.W. & Kooijman, S.A.L.M. 2005. When do mixotrophs specialize? Adaptive dynamics theory applied to a dynamic energy budget model. *Math. Biosci.*, 193(2): 159-182.

Kuijper, L.D., Berg, M.P., E. Morriën, E., Kooi B.W., Verhoef, H.A. 2005. Global change effects on a mechanistic decomposer food web model. *Global Change Biology*, 11:249-265.

Vos, M., Kooi, B.W., DeAngelis, D.L. & Mooij, W.M. 2005. Inducible defences in food webs, In: P.C. de Ruiter, V. Wolters and J. C. Moore editors *Dynamic Food Webs: Multispecies assemblages, ecosystem development, and environmental change – A volume of Theoretical Biology*, pages 114-127, Elsevier Inc.

Troost, T.A., Kooi, B.W. & Kooijman, S.A.L.M. 2005. Ecological specializaton of mixotrophic plankton in a mixed water column. *The American Naturalist*,166(3): E45-E61.

Auger, P., Kooi, B.W., Bravo de la Parra, R. & Poggiale, J.C. 2006. Bifurcation analysis of a predator-prey model with predators using hawk-dove tactics. *Journal of Theoretical Biology*, 238:597-607.

Baer, S.M., Kooi, B.W., Kuznetzov, Yu.A. & Thieme H.R. 2006. Multidimensional bifurcation analysis of a basic two-stage population model. *SIAM Applied Mathematics*, 66(4):1339-1365.

Kooi, B.W. & Troost, T. 2006. Advantages of storage in a fluctuating environment. *Theoretical Population Biology*, 70(4):527-541.

Bruggeman, J., Burchard, H., Kooi, B.W. & Sommeijer, B. 2007. A second-order, unconditionally positive, mass-conserving integration scheme for biochemical systems, *Applied Numerical Mathematics* 57(1):36-58.

Troost, T.A., Kooi, B.W. & Kooijman, S.A.L.M. 2007. Bifurcation analysis of ecological and evolutionary processes in ecosystems.
Ecological Modelling, 204:253-268.

Voorn, v. G.A.K., Hemerik, L., Boer, M.P. & Kooi, B.W. 2007. Heteroclinic orbits indicate overexploitation in predator–prey systems with a strong Allee effect. *Mathematical Biosciences*, 209:451-469.

Abdllaoui, A.El., Auger, P., Kooi, B.W., Bravo de la Parra, R. & Mchich, R. 2007. Effects of density-dependent migrations on stability of a two-patch predator-prey model. *Mathematical Biosciences*, 210:335-354

Kooijman, S.A.L.M., Grasman, J. & Kooi, B.W. 2007. A new class of non-linear stochastic population models with mass conservation. *Mathematical Biosciences*, 210: 378-394.

Kooi, B.W., Bontje, D., Voorn, van G.A.K. & Kooijman, S.A.L.M. 2008. Sublethal toxic effects in a simple aquatic food chain. *Ecological Modelling*, 212: 304-318.

Troost, T.A., Kooi, B.W. & Dieckmann, U. 2008. Joint evolution of predator body size and prey-size preference. *Evolutionary Ecology*, 22:771-799.

Doedel, E.J., Kooi, B.W., Voorn, van G.A.K. & Kuznetsov, YU.A. 2008. Continuation of connecting orbits in 3D-ODEs: (I) Point-to-cycle connections. *International Journal of Bifurcation and Chaos*, 18(7):1889-1903.

Kooi, B.W., Bontje, D. & Liebig, M. 2008. Model analysis of a simple aquatic ecosystems with sublethal toxic effects. *Mathematical Biosciences and Engineering*, 5(4):771-787.

Liebig, M., Schmidt, G., Bontje, D., Kooi, B.W., Streck, G., Traunspurger, W. & Knacker T. 2008. Direct and indirect effects of pollutants on algae and algivorous ciliates in an aquatic indoor microcosm. *Aquatic Toxicology*, 88:102-110.

Voorn, van. G.A.K., Stiefs, D. , Gross,T., Kooi, B.W., Feudel, U. & Kooijman, S.A.L.M. 2008. Stabilization due to predator interference: Comparison of different analysis approaches. *Mathematical Biosciences and Engineering*, 5(3):567-583.

Aguiar, M., Kooi, B.W. & Stollenwerk, N. 2008. Epidemiology of dengue fever: A model with temporary cross-immunity and possible secondary infection shows bifurcations and chaotic behaviour in wide parameter regions. *Mathematical Modelling of Natural Phenomena*, 3(4):48-70.

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Doedel, E.J., Kooi, B.W., Voorn, van G.A.K. & Kuznetsov, YU.A. 2009. Continuation of connecting orbits in 3D-ODEs: (II) Cycle-to-cycle connections. *International Journal of Bifurcation and Chaos*, 19(1):159-169.

Stap, I. van der, Vos, M, Kooi, B.W., Mulling, B.T. Donk E. van & Mooij, W.M. 2009, Algal defenses, population stability and the risk of herbivore extinctions: A chemostat model and experiment. *Ecological Research*, 24: 1145-1153.

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Gerla, D., Vos, M., Kooi, B.W. & Mooij, W. 2009. Bottom-up and top-down effects on the predictability of community composition. *OIKOS*, 118:1044-1052.

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Bontje, D., Kooi,B.W., Voorn G.A.K. van & Kooijman, S.A.L.M. 2009. Feeding threshold and the paradox of enrichment, *Mathematical Modelling of Natural Phenomena*, 4(6): 92-110.

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Aguiar, M., Ballesteros, S., Kooi, B.W., & Stollenwerk, N 2011. The role of seasonality and import in a minimalistic multi-strain dengue model capturing differences between primary and secondary infections: complex dynamics and its implications for data analysis. *Journal of Theoretical Biology*, 289:181-196.

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Preez du F.B., Niekerk van D.D., Kooi, B.W., Rohwer J.M. & Snoep, J.L. 2012. From steady-state to synchronized yeast glycolytic oscillations I: model construction. *FEBS Journal*, 279:2810-2822.

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Gerla, D.J., Gsell, A.S., Kooi, B.W., Ibelings, B.W., van Donk E., & Mooij, W.M. 2013. Alternative states and population crashes in a resource-susceptible-infected model for planktonic parasites and hosts. *Freshwater Biology*, 58:538-551.

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Kooi, B.W., Dutta P.S., & Feudel U. 2013. Resource Competition: A Bifurcation Theory Approach. *Mathematical Modelling of Natural Phenomena*, 8(6):165-185.

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Anna-Karin Gustavsson, Niekerk van D.D., Adiels C. B., Kooi, B.W., Goksör M. & Snoep, J.L. 2014. Allosteric regulation of phosphofructokinase controls the emergence of glycolytic oscillations in isolated yeast cells *FEBS Journal*, 281 2784-2793.

Dutta P.S., Kooi, B.W., & Feudel U. 2014 Multiple Resource Limitation: non-equilibrium coexistence of species in a competition model using a synthesizing unit. *Theoretical Ecology*, 7:407-421.

Lankelma J., Kooi B.W., Krab K., Dorsman J.C., Joenje H. & Westerhoff H.V. 2015. A reason for intermittent fasting to suppress the awakening of dormant breast tumors. *Biosystems* 127:1-6.

Chakraborty S., Kooi B.W., Biswas B., Chattopadhyay J. 2015. Revealing the role of predator interference in a predator-prey system with disease in prey population. *Ecological Complexity*, 21:100-110.

Gerven v. L.P.A., Brederveld R.J., Klein de J.J., DeAngelis D.L., Downing A.S., Faber M., Gerla D.J., 't Hoen J., Janse J.H., Janssen A.B., Jeuken M., Kooi B.W., Kuiper J.J., Lischke B., Liu S., Petzoldt T., Schep S.A., Teurlincx S., Thiange C., Trolle D., van Nes v. E.H., Mooij W.M., 2015. Advantages of concurrent use of multiple software frameworks in water quality modelling using a database approach. *The Fundamental and Applied Limnology*, 186(1-2):5-20.

Gerven v. L., Klein de J., Gerla D., Kooi B.W., Kuiper J., Mooij W., 2015. Competition for light and nutrients in layered communities of aquatic plants. *American Naturalist*, 186:72-83.

Gimmelli G., Kooi B.W., Venturino E., 2015. Ecoepidemic models with prey group defense and feeding saturation *Ecological Complexity*, 22:50-58.

Omta, A-W., Kooi, B.W., Voorn, v. G.A.K., Rickaby, R.E.M., & Follows, M.J. 2016. Inherent characteristics of sawtooth cycles can explain different glacial periodicities. *Climate Dynamics*, 46:557-569.

Kooi, B.W. 2015. Modelling the dynamics of traits involved in fighting-predators–prey system, *Journal of Mathematical Biology*, 71:1575-1605.

Kooi B.W., Venturino E., 2016. Ecoepidemic predator-prey model with feeding satiation, prey herd behavior and abandoned infected prey saturation *Mathematical biosciences*, 274:58-72.

Voorn, v. G.A.K., Kooi, B.W. & Bregt, A.K. 2015. Over-shading is critical for inducing a regime shift from heathland to grassland under nitrogen enrichment. *Ecological Complexity*, in press.

Broeke, t. G.A., Voorn, v. G.A.K., Kooi, B.W., Molenaar, J. 2016. Detecting tipping points in ecological models with sensitivity analysis. *Mathematical Modelling of Natural Phenomena*, in press.