

University of Groningen

Bottom-up and top-down forces in a tropical intertidal ecosystem

de Fouw, Jimmy

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:
2016

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

de Fouw, J. (2016). *Bottom-up and top-down forces in a tropical intertidal ecosystem: The interplay between seagrasses, bivalves and birds*. [Thesis fully internal (DIV), University of Groningen]. Rijksuniversiteit Groningen.

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.



References

A

- Abrams, P. A. 1983. Arguments in favor of higher-order interactions. *American Naturalist* **121**:887–891.
- Afkhami, M. E., P. J. McIntyre, and S. Y. Strauss. 2014. Mutualist-mediated effects on species' range limits across large geographic scales. *Ecology Letters* **17**:1265–1273.
- Ahmedou Salem, M. V., M. van der Geest, T. Piersma, S. Saoud, and J. A. van Gils. 2014. Seasonal changes in mollusc abundance in a tropical intertidal ecosystem, Banc d'Arguin (Mauritania): Testing the 'depletion by shorebirds' hypothesis. *Estuarine, Coastal and Shelf Science* **136**:26–34.
- Altenburg, W., M. Engelmoer, R. Mes, and T. Piersma. 1982. Wintering waders on the Banc d'Arguin, Mauritania. Report of the Netherlands Ornithological Expedition 1980. Leiden, The Netherlands.
- Anderson, A. E. 1995. Metabolic responses to sulfur in lucinid bivalves. *American Zoologist* **35**:121–131.
- Anderson, T. W. 2001. Predator responses, prey refuges and density-dependent mortality of marine fish. *Ecology* **82**:245–257.
- Angelini, C., J. N. Griffin, J. van de Koppel, L. P. M. Lamers, A. Smolders, M. Derksen-Hooijberg, T. van der Heide, and B. R. Silliman. submitted. A keystone mutualism underpins salt marsh resilience to drought.
- Angelini, C., T. van der Heide, J. N. Griffin, J. P. Morton, M. Derksen-Hooijberg, L. P. M. Lamers, A. J. P. Smolders, and B. R. Silliman. 2015. Foundation species' overlap enhances biodiversity and multi-functionality from the patch to landscape scale in southeastern United States salt marshes. *Proceedings of the Royal Society of London B: Biological Sciences* **282**:20150421.
- Argyrou, M., A. Demetropoulos, and M. Hadjichristophorou. 1999. Expansion of the macroalga *Caulerpa racemosa* and changes in soft bottom macrofaunal assemblages in Moni Bay, Cyprus. *Oceanologica Acta* **22**:517–528.
- Arthur, A. D., R. P. Pech, and C. R. Dickman. 2005. Effects of predation and habitat structure on the population dynamics of house mice in large outdoor enclosures. *Oikos* **108**:562–572.
- Au, W. W. L., K. J. Benoit-Bird, and R. A. Kastelein. 2007. Modeling the detection range of fish by echolocating bottlenose dolphins and harbor porpoises. *Journal of the Acoustical Society of America* **121**:3954–3962.
- Aurelia, M. 1969. The habitats of some subtidal pelecypods in Herrington Sound, Bermuda. Pages 39–52 in R. N. Ginsburg and S. M. Stevens, editors. Seminar on organism-sediment inter-relationship. Berm. Biol. Stn Spec., Bermuda.

B

- Bagarinao, T. 1992. Sulfide as an environmental factor and toxicant: tolerance and adaptations in aquatic organisms. *Aquatic Toxicology* **24**:21–62.
- Baker, A. C. 2003. Flexibility and specificity in coral-algal symbiosis: Diversity, ecology, and biogeography of *Symbiodinium*. *Annual Review of Ecology Evolution and Systematics* **34**:661–689.
- Barbier, E. B., S. D. Hacker, C. Kennedy, E. W. Koch, A. C. Stier, and B. R. Silliman. 2011. The value of estuarine and coastal ecosystem services. *Ecological Monographs* **81**:169–193.
- Barkai, A., and C. McQuaid. 1988. Predator-prey role reversal in a marine benthic ecosystem. *Science* **242**:62–64.
- Barnes, P. A. G., and C. S. Hickman. 1999. Lucinid bivalves and marine angiosperms: a search for causal relationships. Pages 215–238 in D. I. Walker and F. E. Wells, editors. *The Seagrass Flora and Fauna of Rottneest Island, Western Australia*. Western Australian Museum, Perth.
- Barrett, R. T., K. Camphuysen, T. Anker-Nilssen, J. W. Chardine, R. W. Furness, S. Garthe, O. Huppopp, M. F. Leopold, W. A. Montevecchi, and R. R. Veit. 2007. Diet studies of seabirds: a review and recommendations. *Ices Journal of Marine Science* **64**:1675–1691.
- Bascompte, J., and P. Jordano. 2007. Plant-animal mutualistic networks: The architecture of biodiversity. *Annual Review of Ecology Evolution and Systematics* **38**:567–593.
- Bastolla, U., M. A. Fortuna, A. Pascual-Garcia, A. Ferrera, B. Luque, and J. Bascompte. 2009. The architecture of mutualistic networks minimizes competition and increases biodiversity. *Nature* **458**:1018–1021.
- Bauer, S., and B. J. Hoyer. 2014. Migratory animals couple biodiversity and ecosystem functioning worldwide. *Science* **344**.

- Bedard, J., and G. Gauthier. 1986. Assessment of fecal output in geese. *Journal of Applied Ecology* **23**:77–90.
- Beddington, J. R. 1975. Mutual interference between parasites or predators and its effect on searching efficiency. *Journal of Animal Ecology* **44**:331–340.
- Bertness, M. D. 1984. Ribbed mussels and *Spartina alterniflora* production in a New England salt-marsh. *Ecology* **65**:1794–1807.
- Bijleveld, A. I. 2015. Untying the knot. Mechanistically understanding the interactions between social foragers and their prey. PhD thesis. University of Groningen.
- Bijleveld, A. I., R. B. MacCurdy, Y. Chan, E. Penning, R. M. Gabrielson, J. Cluderay, E. L. Spaulding, A. Dekinga, S. Holthuijsen, J. ten Horn, M. Brugge, J. A. van Gils, D. W. Winkler, and T. Piersma. Understanding spatial distributions: Negative density-dependence in prey causes predators to trade-off prey quantity with quality. *Proceedings of the Royal Society B-Biological Sciences* In press.
- Bitter-Soto, R. 1999. Benthic communities associated to *Thalassia testudinum* (Hydrocharitaceae) at three localities of Morrocoy National Park, Venezuela. *Revista de Biología Tropical* **47**:443–452.
- Blanchet, H., X. de Montaudouin, A. Lucas, and P. Chardy. 2004. Heterogeneity of macrozoobenthic assemblages within a *Zostera noltii* seagrass bed: diversity, abundance, biomass and structuring factors. *Estuarine Coastal and Shelf Science* **61**:111–123.
- Blunden, J., D. S. Arndt, and M. O. Baringer. 2011. State of the Climate in 2010. *Bulletin of the American Meteorological Society* **92**:S1–S266.
- Blunden, J., D. S. Arndt, and M. O. Baringer. 2012. State of the Climate in 2011. *Bulletin of the American Meteorological Society* **93**:S1–S264.
- Boere, G. C., and T. Piersma. 2012. Flyway protection and the predicament of our migrant birds: A critical look at international conservation policies and the Dutch Wadden Sea. *Ocean & Coastal Management* **68**:157–168.
- Boese, B. L., K. E. Alayan, E. F. Gooch, and B. D. Robbins. 2003. Desiccation index: a measure of damage caused by adverse aerial exposure on intertidal eelgrass (*Zostera marina*) in an Oregon (USA) estuary. *Aquatic Botany* **76**:329–337.
- Bolker, B. M., M. E. Brooks, C. J. Clark, S. W. Geange, J. R. Poulsen, M. H. H. Stevens, and J. S. S. White. 2009. Generalized linear mixed models: a practical guide for ecology and evolution. *Trends in Ecology & Evolution* **24**:127–135.
- Bom, R. A., J. de Fouw, R. H. G. Klaassen, E. J. Jansen, M. S. S. Lavaleye, B. J. Ens, T. Oudman, T. Piersma, and J. A. van Gils. *in prep.* Food web consequences of an evolutionary arms race: invertebrates subject to crab predation became unavailable for shorebirds at intertidal mudflats of Oman.
- Boonman, A. M., M. Boonman, F. Bretschneider, and W. A. van de Grind. 1998. Prey detection in trawling insectivorous bats: duckweed affects hunting behaviour in Daubenton's bat, *Myotis daubentonii*. *Behavioral Ecology and Sociobiology* **44**:99–107.
- Bostrom, C., and E. Bonsdorff. 1997. Community structure and spatial variation of benthic invertebrates associated with *Zostera marina* (L) beds in the northern Baltic Sea. *Journal of Sea Research* **37**:153–166.
- Bowen, W. D. 2000. Reconstruction of pinniped diets: accounting for complete digestion of otoliths and *cephalopod* beaks. *Canadian Journal of Fisheries and Aquatic Sciences* **57**:898–905.
- Box, G. E. P., and D. R. Cox. 1964. An analysis of transformations. *Journal of the Royal Statistical Society, Series B* **26**:211–252.
- Bradley, B. J., M. Stiller, D. M. Doran-Sheehy, T. Harris, C. A. Chapman, L. Vigilant, and H. Poinar. 2007. Plant DNA sequences from feces: Potential means for assessing diets of wild primates. *American Journal of Primatology* **69**:699–705.
- Bressendorff, B. B., and S. Toft. 2011. Dome-shaped functional response induced by nutrient imbalance of the prey. *Biology Letters* **7**:517–520.
- Brissac, M. T. 2009. Nature, diversité et spécificité de l'association *Lucinidae*/bactéries sulfo-oxydantes. Université Pierre et Marie Curie Paris.
- Brown, J. S. 1988. Patch use as an indicator of habitat preference, predation risk and competition. *Behavioral Ecology and Sociobiology* **22**:37–47.
- Brown, J. S., editor. 2010. *Ecology of Fear*. Oxford: Academic Press.

- Brown, J. S., and B. P. Kotler. 2004. Hazardous duty pay and the foraging cost of predation. *Ecology Letters* 7:999–1014.
- Bruno, J. F., and M. D. Bertness. 2001. Habitat modification and facilitation in benthic marine communities. Pages 201–218 *Marine Community Ecology*. Sinauer.
- Bruno, J. F., J. J. Stachowicz, and M. D. Bertness. 2003. Inclusion of facilitation into ecological theory. *Trends in Ecology and Evolution* 18:119–125.
- Buehler, D. M. 2008. Travelling on a budget: predictions and ecological evidence for bottlenecks in the annual cycle of long-distance migrants. PhD thesis. University of Groningen.
- Burkholder, J. M., D. A. Tomasko, and B. W. Touchette. 2007. Seagrasses and eutrophication. *Journal of Experimental Marine Biology and Ecology* 350:46–72.
- Burkle, L. A., J. C. Marlin, and T. M. Knight. 2013. Plant-pollinator interactions over 120 years: Loss of species, co-occurrence, and function. *Science* 339:1611–1615.
- Burton, C., and C. J. Camphuysen. 2003. Chinguetti development project: Seabird and cetacean surveys in the vicinity of the Chinguetti oil field, offshore Mauritania, March 2003. Perth, Western Australia.
- C**
- Cabral, J. P., and R. M. N. Jorge. 2007. Compressibility and shell failure in the European Atlantic *Patella* limpets. *Marine Biology* 150:585–597.
- Caffrey, J. M., and W. M. Kemp. 1991. Seasonal and spatial patterns of oxygen production, respiration and root rhizome release in *Potamogeton perfoliatus* L. and *Zostera marina* L. *Aquatic Botany* 40: 109–128.
- Calleja, M. L., N. Marba, and C. M. Duarte. 2007. The relationship between seagrass (*Posidonia oceanica*) decline and sulfide porewater concentration in carbonate sediments. *Estuarine Coastal and Shelf Science* 73:583–588.
- Camphuysen, C. J., and T. M. van Spanje. 2013. Ship-based seabird and marine mammal surveys off Mauritania, Nov-Dec 2012.
- Carpenter, K. E., M. Abrar, G. Aeby, R. B. Aronson, S. Banks, A. Bruckner, A. Chiriboga, J. Cortes, J. C. Delbeek, L. DeVantier, G. J. Edgar, A. J. Edwards, D. Fenner, H. M. Guzman, B. W. Hoeksema, G. Hodgson, O. Johan, W. Y. Licuanan, S. R. Livingstone, E. R. Lovell, J. A. Moore, D. O. Obura, D. Ochavillo, B. A. Polidoro, W. F. Precht, M. C. Quibilan, C. Reboton, Z. T. Richards, A. D. Rogers, J. Sanciangco, A. Sheppard, C. Sheppard, J. Smith, S. Stuart, E. Turak, J. E. N. Veron, C. Wallace, E. Weil, and E. Wood. 2008. One-third of reef-building corals face elevated extinction risk from climate change and local impacts. *Science* 321:560–563.
- Carter, R. M. 1968. On the biology and palaeontology of some predators of bivalved mollusca. *Palaeogeogr. Palaeoclimatol.* 4:29–65.
- Cavanaugh, C. M. 1983. Symbiotic chemoautotrophic bacteria in marine invertebrates from sulphide-rich habitats. *Nature* 302:58–61.
- Centeno, A. B. 2008. *Ecología de Caulerpales: Fauna y Biomarcadores*. Mallorca, Spain.
- Center for Coastal Studies. 1996. Current status and historical trends of the estuarine living resources within the CCBNEP study area. Center for Coastal Studies, Texas A&M University, Corpus Christi.
- Chame, M. 2003. Terrestrial mammal feces: a morphometric summary and description. *Memorias Do Instituto Oswaldo Cruz* 98:71–94.
- Charnov, E. L., G. H. Orians, and K. Hyatt. 1976. Ecological implications of resource depression. *American Naturalist* 110:247–259.
- Chateigner, D., C. Hedegaard, and H. R. Wenk. 2000. Mollusc shell microstructures and crystallographic textures. *Journal of Structural Geology* 22:1723–1735.
- Chelazzi, G., and M. Vannini. 1980. Zonation of intertidal molluscs on rocky shores of southern Somalia. *Estuarine and Coastal Marine Science* 10:569–583.
- Childress, J. J., and P. R. Girguis. 2011. The metabolic demands of endosymbiotic chemoautotrophic metabolism on host physiological capacities. *Journal of Experimental Biology* 214:312–325.
- Christensen, J. H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R. K. Kolli, W. T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C. G. Menéndez, J. Räisänen, A. Rinke, A. Sarr, and P. Whetton. 2007. Regional Climate Projections. *in* S. Solomon, D. Qin, M. Manning, Z. Chen, M.

- Marquis, K. B. Averyt, M. Tignor, and H. L. Miller, editors. Climate Change 2007. The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Press, Cambridge, United Kingdom and New York, NY, USA., Cambridge University.
- Cinar, M. E., Z. Ergen, B. Ozturk, and F. Kirkim. 1998. Seasonal analysis of zoobenthos associated with a *Zostera marina* L. bed in Gulbahce Bay (Aegean Sea, Turkey). *Marine Ecology-Pubblicazioni Della Stazione Zoologica Di Napoli I* **19**:147–162.
- Continental Shelf Associates, I. 1995. Synthesis of available biological, geological, chemical, socioeconomic, and cultural resource information for the South Florida area. Supplemental report: A comparison of seagrass beds in Panama and South Florida., New Orleans.
- Cook, K. H., and E. K. Vizy. 2015. Detection and Analysis of an Amplified Warming of the Sahara Desert. *Journal of Climate* **28**:6560–6580.
- Costanza, R., R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. V. Oneill, J. Paruelo, R. G. Raskin, P. Sutton, and M. van den Belt. 1997. The value of the world's ecosystem services and natural capital. *Nature* **387**:253–260.
- Couto, E. C. G., and M. Savian. 1998. Caracterização sedimentológica da planície intertidal da parte sul do saco do limoeiro (Ilha do Mel - Paraná - Brasil). I. implicações ecológicas. *Brazilian Archives of Biology and Technology* **41**:0.
- Creed, J. C., and M. Kinupp. 2011. Small-scale change in mollusk diversity along a depth gradient in a seagrass bed off Cabo Frio (Southeast Brazil). *Brazilian Journal of Oceanography* **59**:267–276.
- Cunningham, S., I. Castro, and M. Alley. 2007. A new prey-detection mechanism for kiwi (*Apteryx* spp.) suggests convergent evolution between paleognathous and neognathous birds. *Journal of Anatomy* **211**:493–502.
- Cunningham, S. J., M. R. Alley, I. Castro, M. A. Potter, M. Cunningham, and M. J. Pyne. 2010. Bill morphology of Ibises suggests a remote-tactile sensory system for prey detection. *Auk* **127**:308–316.
- Cunningham, S. J., I. Castro, and M. A. Potter. 2009. The relative importance of olfaction and remote touch in prey detection by North Island brown kiwis. *Animal Behaviour* **78**:899–905.
- D**
- Dakos, V., and J. Bascompte. 2014. Critical slowing down as early warning for the onset of collapse in mutualistic communities. *Proceedings of the National Academy of Sciences of the United States of America* **111**:17546–17551.
- Dakos, V., S. R. Carpenter, E. H. van Nes, and M. Scheffer. 2015. Resilience indicators: prospects and limitations for early warnings of regime shifts. *Philosophical Transactions of the Royal Society B-Biological Sciences* **370**:20130263.
- Dakos, V., E. H. van Nes, and M. Scheffer. 2013. Flickering as an early warning signal. *Theoretical Ecology* **6**:309–317.
- Dale, A. L., R. McAllen, and P. Whelan. 2007. Management considerations for subtidal *Zostera marina* beds in Ireland. Department of Zoology, Ecology & Plant Science University College Cork, Dublin, Ireland.
- Dando, P. R., A. J. Southward, and E. C. Southward. 1986. Chemoautotrophic symbionts in the gills of the bivalve mollusc *Lucinoma borealis* and the sediment chemistry of its habitat. *Proceedings of the Royal Society of London Series B-Biological Sciences* **227**:227–247.
- Davidson, N. C. 2014. How much wetland has the world lost? Long-term and recent trends in global wetland area. *Marine and Freshwater Research* **65**:934–941.
- Dayton, P. 1972. Toward an understanding of community resilience and the potential effects of enrichments to the benthos at McMurdo Sound, Antarctica. Pages 81–95 in *Proceedings of the Colloquium on Conservation Problems in Antarctica*. Allen Press, Lawrence, Kansas, USA.
- de Boer, W. F. 2007. Seagrass-sediment interactions, positive feedbacks and critical thresholds for occurrence: a review. *Hydrobiologia* **591**:5–24.
- de Boer, W. F., and H. H. T. Prins. 2002. Human exploitation and benthic community structure on a tropical intertidal flat. *Journal of Sea Research* **48**:225–240.

- de Paz, L., J. M. Neto, J. C. Marques, and A. J. Laborda. 2008. Response of intertidal macrobenthic communities to long term human induced changes in the Eo estuary (Asturias, Spain): Implications for environmental management. *Marine Environmental Research* **66**:288–299.
- De Swart, H. E., and J. T. F. Zimmerman. 2009. Morphodynamics of tidal inlet systems. *Annual Review of Fluid Mechanics* **41**:203–229.
- Dean, T. A., and S. C. Jewett. 2001. Habitat-specific recovery of shallow subtidal communities following the Exxon Valdez oil spill. *Ecological Applications* **11**:1456–1471.
- Dekinga, A., M. W. Dietz, A. Koolhaas, and T. Piersma. 2001. Time course and reversibility of changes in the gizzards of red knots alternately eating hard and soft food. *Journal of Experimental Biology* **204**:2167–2173.
- Dekinga, A., and T. Piersma. 1993. Reconstructing diet composition on the basis of faeces in a mollusc-eating wader, the Knot *Calidris canutus*. *Bird Study* **40**:144–156. .
- Delany, S., D. Scott, T. Dodman, and D. A. Stroud, editors. 2009. An atlas of wader populations in Africa and Western Eurasia.
- Díaz, J. M. 2003. Diversidad do moluscos en una pradera de *Thalassia testudinum* en el parque Nacional Natural Tayrona. Page 159 in J. M. Díaz Merlano, L. M. Barrios Suárez, and D. I. Gómez-LópezDíaz, editors. *Las Praderas de Pastos Marinos en Colombia Estructura y Distribución de un Ecosistema Estratégico*. Instituto de Investigaciones Marinas y Costeras “José Benito Vives De Andrés” Santa Marta, Columbia.
- Díaz, O. D., and I. Liñero-Arana. 2004. Mollusks community associated to *Thalassia testudinum* (Bank et Köning 1805), in Mochima Bay, Venezuela. *Acta Científica Venezolana* **55**:44–55.
- Distel, D. L. 1998. Evolution of chemoautotrophic endosymbioses in bivalves - Bivalve-bacteria chemo-symbioses are phylogenetically diverse but morphologically similar. *Bioscience* **48**:277–286.
- Doyle, S., B. MacDonald, and R. Rochette. 2010. Is water temperature responsible for geographic variation in shell mass of *Littorina obtusata* (L.) snails in the Gulf of Maine? *Journal of Experimental Marine Biology and Ecology* **394**:98–104.
- Duarte, C. M. 1989. Temporal biomass variability and reproduction biomass relationship of seagrass communities. *Marine Ecology Progress Series* **51**:269–276.
- Duarte, C. M. 1990. Seagrass nutrient content. *Marine Ecology-Progress Series* **67**:201–207.
- Duarte, C. M. 1991. Seagrass depth limits. *Aquatic Botany* **40**:363–377.
- Dutra, G. F., G. R. Allen, T. Werner, and S. A. McKenna. 2005. A Rapid Marine Biodiversity Assessment of the Abrolhos Bank, Bahia, Brazil, Washington, USA.
- E**
- Edgar, G. J., N. S. Barrett, and D. J. Gradon. 1999a. A classification of Tasmanian estuaries and assessment of their conservation significance using ecological and physical attributes, population and land use. Published by the Marine Research Laboratories, University of Tasmania Tasmania.
- Edgar, G. J., N. S. Barrett, and P. R. Last. 1999b. The distribution of macroinvertebrates and fishes in Tasmanian estuaries. *Journal of Biogeography* **26**:1169–1189.
- Edgar, G. J., C. Shaw, G. F. Watson, and L. S. Hammond. 1994. Comparisons of species richness, size-structure and production of benthos in vegetated and unvegetated habitats in Western Fort, Victoria. *Journal of Experimental Marine Biology and Ecology* **176**:201–226.
- Edgell, T. C., and C. J. Neufeld. 2008. Experimental evidence for latent developmental plasticity: intertidal whelks respond to a native but not an introduced predator. *Biology Letters* **4**:385–387.
- Eklöf, J. S., M. de la Torre-Castro, L. Adelsköld, N. S. Jiddawi, and N. Kautsky. 2005. Differences in macrofaunal and seagrass assemblages in seagrass beds with and without seaweed farms. *Estuarine Coastal and Shelf Science* **63**:385–396.
- Ellison, A. M., E. J. Farnsworth, and R. R. Twilley. 1996. Facultative mutualism between red mangroves and root-fouling sponges in Belizean mangal. *Ecology* **77**:2431–2444.
- Estes, J. A., J. Terborgh, J. S. Brashares, M. E. Power, J. Berger, W. J. Bond, S. R. Carpenter, T. E. Essington, R. D. Holt, J. B. C. Jackson, R. J. Marquis, L. Oksanen, T. Oksanen, R. T. Paine, E. K. Pikitch, W. J. Ripple, S. A. Sandin, M. Scheffer, T. W. Schoener, J. B. Shurin, A. R. E. Sinclair, M. E. Soulé, R. Virtanen, and D. A. Wardle. 2011. Trophic downgrading of Planet Earth. *Science* **333**:301–306.

F

- Fabry, V. J., B. A. Seibel, R. A. Feely, and J. C. Orr. 2008. Impacts of ocean acidification on marine fauna and ecosystem processes. *Ices Journal of Marine Science* **65**:414–432.
- Fedriani, J. M., and M. H. Kohn. 2001. Genotyping faeces links individuals to their diet. *Ecology Letters* **4**:477–483.
- Ferguson, C. A., and A. I. Miller. 2007. A sea change in Smuggler's Cove? Detection of decadal-scale compositional transitions in the subfossil record. *Palaeogeography Palaeoclimatology Palaeoecology* **254**:418–429.
- Feulner, G. R., and R. J. Hornby. 2006. Intertidal molluscs in UAE lagoons. *Tribulus* **16**:17–23.
- Fisher, M. R., and S. C. Hand. 1984. Chemoautotrophic symbionts in the bivalve *Lucina floridana* from seagrass beds. *Biological Bulletin* **167**:445–459.
- Folmer, E. O. 2012. Self-organization on mudflats. PhD thesis. University of Groningen.
- Folmer, E. O., M. van der Geest, E. J. Jansen, H. Olf, T. M. Anderson, T. Piersma, and J. A. van Gils. 2012. Seagrass–Sediment Feedback: An Exploration Using a Non-recursive Structural Equation Model. *Ecosystems* **15**:1380–1393.
- Fonseca, M. S., W. J. Kenworthy, B. E. Julius, S. Shutler, and S. Fluke. 2001. Chapter 7: Seagrasses. in M. R. Perrow, editor. *Handbook of Ecological Restoration*. Cambridge University Press, Cambridge.
- Fourqurean, J. W., C. M. Duarte, H. Kennedy, N. Marba, M. Holmer, M. A. Mateo, E. T. Apostolaki, G. A. Kendrick, D. Krause-Jensen, K. J. McGlathery, and O. Serrano. 2012. Seagrass ecosystems as a globally significant carbon stock. *Nature Geoscience* **5**:505–509.
- Fraser, M. W., G. A. Kendrick, J. Statton, R. K. Hovey, A. Zavala-Perez, and D. I. Walker. 2014. Extreme climate events lower resilience of foundation seagrass at edge of biogeographical range. *Journal of Ecology* **102**:1528–1536.
- Fredriksen, S., A. De Backer, C. Bostrom, and H. Christie. 2010. Infauna from *Zostera marina* L. meadows in Norway. Differences in vegetated and unvegetated areas. *Marine Biology Research* **6**:189–200.
- Fryxell, J. M. 1991. Forage quality and aggregation by large herbivores. *American Naturalist* **138**:478–498.

G

- Garcia, R., M. Holmer, C. M. Duarte, and N. Marba. 2013. Global warming enhances sulphide stress in a key seagrass species (NW Mediterranean). *Global Change Biology* **19**:3629–3639.
- Gerritsen, A. F. C., and A. Meiboom. 1986. The role of touch in prey density estimation by *Calidris alba*. *Netherlands Journal of Zoology* **36**:530–561.
- Gibbs, P. J., G. B. Maguire, and L. C. Collett. 1984. The macrobenthic fauna of *Halophila* seagrass meadows in New South Wales. *Wetlands (Australia)* **4**:23–32.
- Gillis, L. G., T. J. Bouma, C. G. Jones, M. M. van Katwijk, I. Nagelkerken, C. J. L. Jeuken, P. M. J. Herman, and A. D. Ziegler. 2014. Potential for landscape-scale positive interactions among tropical marine ecosystems. *Marine Ecology Progress Series* **503**:289–303.
- Glover, E. A., and J. D. Taylor. 2007. Diversity of chemosymbiotic bivalves on coral reefs: *Lucinidae* (Mollusca, Bivalvia) of New Caledonia and Lifou. *Zoosystema* **29**:109–181.
- Gonzalez, P. M., T. Piersma, and Y. Verkuil. 1996. Food, feeding, and refuelling of Red Knots during northward migration at San Antonio Oeste, Rio Negro, Argentina. *Journal of Field Ornithology* **67**:575–591.
- Gopinadha-Pillai, C. S., and K. K. Appukuttan. 1980. Distribution of molluscs in and around the coral reefs of the southeastern coast in India. *Journal of the Bombay Natural History Society* **77**:26–48.
- Govers, L. L., J. H. F. de Brouwer, W. Suykerbuyk, T. J. Bouma, L. P. M. Lamers, A. J. P. Smolders, and M. M. van Katwijk. 2014. Toxic effects of increased sediment nutrient and organic matter loading on the seagrass *Zostera noltii*. *Aquatic Toxicology* **155**:253–260.
- Green, E. P., and F. T. Short. 2003. *World Atlas of Seagrasses*. University of California Press, Berkeley, USA.
- Greenway, M. 1995. Trophic relationship of macrofauna within a Jamaican seagrass meadow and the role of the echinoid *Lytechinus variegatus* (Lamarck). *Bulletin of Marine Science* **56**:719–736.
- Gros, O., M. Liberge, and H. Felbeck. 2003. Interspecific infection of aposymbiotic juveniles of *Codakia orbicularis* by various tropical lucinid gill-endosymbionts. *Marine Biology* **142**:57–66.

H

- Hairston, N. G., F. E. Smith, and L. B. Slobodkin. 1960. Community structure, population control, and competition. *American Naturalist* **94**:421–425.
- Halpern, B. S., S. Walbridge, K. A. Selkoe, C. V. Kappel, F. Micheli, C. D'Agrosa, J. F. Bruno, K. S. Casey, C. Ebert, H. E. Fox, R. Fujita, D. Heinemann, H. S. Lenihan, E. M. P. Madin, M. T. Perry, E. R. Selig, M. Spalding, R. Steneck, and R. Watson. 2008. A global map of human impact on marine ecosystems. *Science* **319**:948–952.
- Hammill, M. O., V. Lesage, and P. Carter. 2005. What do harp seals eat? Comparing diet composition from different compartments of the digestive tract with diets estimated from stable-isotope ratios. *Canadian Journal of Zoology-Revue Canadienne De Zoologie* **83**:1365–1372.
- Hansen, J. C. R., and M. A. Reidenbach. 2012. Wave and tidally driven flows in eelgrass beds and their effect on sediment suspension. *Marine Ecology-Progress Series* **448**:271–287.
- Harriague, A. C., C. N. Bianchi, and G. Albertelli. 2006. Soft-bottom macrobenthic community composition and biomass in a *Posidonia oceanica* meadow in the Ligurian Sea (NW Mediterranean). *Estuarine Coastal and Shelf Science* **70**:251–258.
- Hauser, I., W. Oschmann, and E. Gischler. 2007. Modern bivalve shell assemblages on three atolls offshore Belize (Central America, Caribbean Sea). *Facies* **53**:451–478.
- Hay, M. E., J. D. Parker, D. E. Burkepile, C. C. Caudill, A. E. Wilson, Z. P. Hallinan, and A. D. Chequer. 2004. Mutualisms and aquatic community structure: The enemy of my enemy is my friend. *Annual Review of Ecology Evolution and Systematics* **35**:175–197.
- Heck, K. L., T. J. B. Carruthers, C. M. Duarte, A. R. Hughes, G. Kendrick, R. J. Orth, and S. W. Williams. 2008. Trophic transfers from seagrass meadows subsidize diverse marine and terrestrial consumers. *Ecosystems* **11**:1198–1210.
- Heuermann, N., F. van Langevelde, S. E. van Wieren, and H. H. T. Prins. 2011. Increased searching and handling effort in tall swards lead to a Type IV functional response in small grazing herbivores. *Oecologia* **166**:659–669.
- Hily, C., and M. Bouteille. 1999. Modifications of the specific diversity and feeding guilds in an intertidal sediment colonized by an eelgrass meadow (*Zostera marina*) (Brittany, France). *Comptes Rendus De L'Academie Des Sciences - Serie III- Sciences De La Vie-Life Sciences* **322**:1121–1131.
- Hirota, M., M. Holmgren, E. H. Van Nes, and M. Scheffer. 2011. Global resilience of tropical forest and savanna to critical transitions. *Science* **334**:232–235.
- Hoegh-Guldberg, O., P. J. Mumby, A. J. Hooten, R. S. Steneck, P. Greenfield, E. Gomez, C. D. Harvell, P. F. Sale, A. J. Edwards, K. Caldeira, N. Knowlton, C. M. Eakin, R. Iglesias-Prieto, N. Muthiga, R. H. Bradbury, A. Dubi, and M. E. Hatzioiols. 2007. Coral reefs under rapid climate change and ocean acidification. *Science* **318**:1737–1742.
- Holling, C. S. 1959. Some characteristics of simple types of predation and parasitism. *The Canadian Entomologist* **91**:385–398.
- Holling, C. S. 1961. Principles of insect predation. *Annual Review of Entomology* **6**:163–182.
- Holmer, M., and E. J. Bondgaard. 2001. Photosynthetic and growth response of eelgrass to low oxygen and high sulfide concentrations during hypoxic events. *Aquatic Botany* **70**:29–38.
- Holmer, M., and H. Hasler-Sheetal. 2014. Sulfide intrusion in seagrasses assessed by stable sulfur isotopes – A synthesis of current results. *Frontiers in Marine Science* **1**:1–12.
- Holt, R. D., R. M. Holdo, and F. J. F. van Veen. 2010. Theoretical perspective on trophic cascade: Current trends and future directions. *in* J. Terborgh and J. A. Estes, editors. *Trophic cascades. Predators, prey, and the changing dynamics of nature*. Island Press.
- Holzmann, H., and S. Vollmer. 2008. A likelihood ratio test for bimodality in two-component mixtures with application to regional income distribution in the EU. *Advances in Statistical Analysis* **92**:57–69.
- Honkoop, P. J. C., E. M. Berghuis, S. Holthuijsen, M. S. S. Lavaleye, and T. Piersma. 2008. Molluscan assemblages of seagrass-covered and bare intertidal flats on the Banc d'Arguin, Mauritania, in relation to characteristics of sediment and organic matter. *Journal of Sea Research* **60**:235–243.
- Hopcraft, J. G. C., A. R. E. Sinclair, and C. Packer. 2005. Planning for Success: Serengeti Lions Seek Prey Accessibility Rather than Abundance. *Journal of Animal Ecology* **74**:559–566.

- Huang, X. 2008. National report on seagrass in the South China Sea - China. South China Sea Institute of Oceanology, Chinese Academy of Sciences, Guangzhou, China.
- Hughes, B. B., R. Eby, E. Van Dyke, M. T. Tinker, C. I. Marks, K. S. Johnson, and K. Wasson. 2013. Recovery of a top predator mediates negative eutrophic effects on seagrass. *Proceedings of the National Academy of Sciences* **110**:15313–15318.
- Hulscher, J. B. 1982. The Oystercatcher *Haematopus ostralegus* as a predator of bivalve *Macoma balthica* in the Dutch Wadden Sea. *Ardea* **70**:89–152.
- Hutchings, P. A., Wells F. E., W. D. I., and G. A. Kendrick. 1991. Seagrass, sediment and infauna – a comparison of *Posidonia australis*, *Posidonia sinuosa* and *Amphibolis antarctica* in Princess Royal Harbour, South-Western Australia. III. Consequences of seagrass loss. Pages 611–633 in W. F. E., W. D. I., H. Kirkman, and R. Lethbridge, editors. *The Flora and Fauna of the Albany Area, Western Australia*. Western Australian Museum, Perth.
- I**
- IPCC. 2014. *Climate change 2014: Impacts, adaptation, and vulnerability. Part A: Global and sectoral aspects. Contribution of working group II to the fifth assessment report of the Intergovernmental Panel on Climate Change*. Cambridge.
- Isaksen, M. F., and K. Finster. 1996. Sulphate reduction in the root zone of the seagrass *Zostera noltii* on the intertidal flats of a coastal lagoon (Arcachon, France). *Marine Ecology-Progress Series* **137**:187–194.
- J**
- Jackson, J. B. C. 1972. The ecology of the molluscs of *Thalassia* communities, Jamaica, West Indies. II. Molluscan population variability along an environmental stress gradient. *Marine Biology* **14**: 304–337.
- Jackson, J. B. C., M. X. Kirby, W. H. Berger, K. A. Bjorndal, L. W. Botsford, B. J. Bourque, R. H. Bradbury, R. Cooke, J. Erlandson, J. A. Estes, T. P. Hughes, S. Kidwell, C. B. Lange, H. S. Lenihan, J. M. Pandolfi, C. H. Peterson, R. S. Steneck, M. J. Tegner, and R. R. Warner. 2001. Historical overfishing and the recent collapse of coastal ecosystems. *Science* **293**:629–638.
- Jarman, S. N., N. J. Gales, M. Tierney, P. C. Gill, and N. G. Elliott. 2002. A DNA-based method for identification of krill species and its application to analysing the diet of marine vertebrate predators. *Molecular Ecology* **11**:2679–2690.
- Jenni, L., P. Reutimann, and S. Jennieiermann. 1990. Recognizability of different food types in feces and in alimentary flushes of *Sylvia* warblers. *Ibis* **132**:445–453.
- Jeschke, J. M., M. Kopp, and R. Tollrian. 2002. Predator functional responses: Discriminating between handling and digesting prey. *Ecological Monographs* **72**:95–112.
- Jeschke, J. M., and R. Tollrian. 2007. Prey swarming: which predators become confused and why? *Animal Behaviour* **74**:387–393.
- Jewett, S. C., T. A. Dean, R. O. Smith, and A. Blanchard. 1999. 'Exxon Valdez' oil spill: impacts and recovery in the soft-bottom benthic community in and adjacent to eelgrass beds. *Marine Ecology-Progress Series* **185**:59–83.
- Johnson, M., M. Diouris, and M. Lepennec. 1994. Endosymbiotic bacterial contribution in the carbon nutrition of *Loripes lucinalis* (Mollusca: Bivalvia). *Symbiosis* **17**:1–13.
- Johnson, M. A., C. Fernandez, and G. Pergent. 2002. The ecological importance of an invertebrate chemoautotrophic symbiosis to phanerogam seagrass beds. *Bulletin of Marine Science* **71**: 1343–1351.
- Jones, C. G., J. H. Lawton, and M. Shachak. 1994. Organisms as ecosystem engineers. *Oikos* **69**: 373–386.
- Jorda, G., N. Marba, and C. M. Duarte. 2013. Climate warming and Mediterranean seagrass. *Nature Clim. Change* **3**:3–4.
- Jorgensen, B. B. 1982. Mineralization of organic matter in the sea bed – The role of sulphate reduction. *Nature* **296**:643–645.
- K**
- Kharlamenko, V. I., S. I. Kiyashko, A. B. Imbs, and D. I. Vyshkvartzev. 2001. Identification of food sources of invertebrates from the seagrass *Zostera marina* community using carbon and sulfur stable isotope ratio and fatty acid analyses. *Marine Ecology-Progress Series* **220**:103–117.

- Kicklighter, C. E., C. R. Fisher, and M. E. Hay. 2004. Chemical defense of hydrothermal vent and hydrocarbon seep organisms: a preliminary assessment using shallow-water consumers. *Marine Ecology-Progress Series* **275**:11–19.
- Kiers, E. T., T. M. Palmer, A. R. Ives, J. F. Bruno, and J. L. Bronstein. 2010. Mutualisms in a changing world: an evolutionary perspective. *Ecology Letters* **13**:1459–1474.
- Knowlton, N. 2001. The future of coral reefs. *Proceedings of the National Academy of Sciences of the United States of America* **98**:5419–5425.
- Koch, E. M. 2001. Beyond light: Physical, geological, and geochemical parameters as possible submersed aquatic vegetation habitat requirements. *Estuaries* **24**:1–17.
- Koch, M. S., S. Schopmeyer, C. Kyhn-Hansen, and C. J. Madden. 2007. Synergistic effects of high temperature and sulfide on tropical seagrass. *Journal of Experimental Marine Biology and Ecology* **341**: 91–101.
- Kohn, M. H., and R. K. Wayne. 1997. Facts from feces revisited. *Trends in Ecology & Evolution* **12**: 223–227.
- Kraan, C. 2010. Spatial ecology of intertidal macrobenthic fauna in a changing Wadden Sea. PhD thesis. University of Groningen.
- Kuriandewa, T. E. 2008. National report on seagrass in the South China Sea - Indonesia. Puslit Oseanografi, Lipi, Jakarta, Indonesia.
- Kwiatkowski, L., P. Cox, P. R. Halloran, P. J. Mumby, and A. J. Wiltshire. 2015. Coral bleaching under unconventional scenarios of climate warming and ocean acidification. *Nature Climate Change* **5**:777–781.
- L**
- Lamb, H. 1932. *Hydrodynamics*. 6th edition, New York: Dover.
- Lamers, L. P. M., L. L. Govers, I. C. J. M. Janssen, J. J. M. Geurts, M. E. W. van der Welle, M. M. van Katwijk, T. van der Heide, J. G. M. Roelofs, and A. J. P. Smolders. 2013. Sulfide as a soil phytotoxin - A review. *Frontiers in Plant Science* **4**:1–14.
- Lamers, L. P. M., H. B. M. Tomassen, and J. G. M. Roelofs. 1998. Sulfate-induced entrophication and phytotoxicity in freshwater wetlands. *Environmental Science & Technology* **32**:199–205.
- Lannin, R., and K. Hovel. 2011. Variable prey density modifies the effects of seagrass habitat structure on predator-prey interactions. *Marine Ecology Progress Series* **442**:59–70.
- Larkum, A. W. D., R. J. Orth, and C. M. Duarte. 2006. *Seagrasses: Biology, Ecology and Conservation*. Springer, Dordrecht, The Netherlands.
- Lee, Y. F., and L. L. Severinghaus. 2004. Sexual and seasonal differences in the diet of *Lanyu scops* owls based on fecal analysis. *Journal of Wildlife Management* **68**:299–306.
- Leschen, A. S., R. K. Kessler, and B. T. Estrella. 2009. Eelgrass restoration used as construction impact mitigation in Boston harbor, Massachusetts. Massachusetts Division of Marine Fisheries, New Bedford.
- Leuschner, C., S. Landwehr, and U. Mehlig. 1998. Limitation of carbon assimilation of intertidal *Zostera noltii* and *Z. marina* by desiccation at low tide. *Aquatic Botany* **62**:171–176.
- Lever, J., E. H. van Nes, M. Scheffer, and J. Bascompte. 2014. The sudden collapse of pollinator communities. *Ecology Letters*: 350–359.
- Lewis, F. G., and A. W. Stoner. 1981. An examination of methods for sampling macrobenthos in seagrass meadows. *Bulletin of Marine Science* **31**:116–124.
- Leyrer, J. 2011. Being at the right place at the right time: Interpreting the annual life cycle of Afro-Siberian red knots. PhD thesis. University of Groningen.
- Leyrer, J., T. Lok, M. Brugge, A. Dekinga, B. Spaans, J. A. van Gils, B. K. Sandercock, and T. Piersma. 2012. Small-scale demographic structure suggests preemptive behavior in a flocking shorebird. *Behavioral Ecology* **23**:1226–1233.
- Liljedahl, L. 1991. Contrasting feeding strategies in bivalves from the Silurian of Gotland. *Palaeontology* **34**:219–235.
- Livina, V. N., F. Kwasiok, and T. M. Lenton. 2010. Potential analysis reveals changing number of climate states during the last 60 kyr. *Climate of the Past* **6**:77–82.

- Livina, V. N., and T. M. Lenton. 2007. A modified method for detecting incipient bifurcations in a dynamical system. *Geophysical Research Letters* **34**:1–5.
- Liznarova, E., and S. Pekar. 2013. Dangerous prey is associated with a type 4 functional response in spiders. *Animal Behaviour* **85**:1183–1190.
- Loarie, S. R., C. J. Tambling, and G. P. Asner. 2013. Lion hunting behaviour and vegetation structure in an African savanna. *Animal Behaviour* **85**:899–906.
- Loya, Y., K. Sakai, K. Yamazato, Y. Nakano, H. Sambali, and R. van Woensik. 2001. Coral bleaching: the winners and the losers. *Ecology Letters* **4**:122–131.
- Lucas, A., and P. G. Beninger. 1985. The use of physiological condition indices in marine bivalve aquaculture. *Aquaculture* **44**:187–200.
- Ludwig, D., D. D. Jones, and C. S. Holling. 1978. Qualitative-analysis of insect outbreak systems - Spruce budworm and forest. *Journal of Animal Ecology* **47**:315–332.
- M**
- MacArthur, R. H., and E. R. Pianka. 1966. On optimal use of a patchy environment. *The American Naturalist* **100**:603–609.
- Madsen, P. T., I. Kerr, and R. Payne. 2004. Echolocation clicks of two free-ranging, oceanic delphinids with different food preferences: false killer whales *Pseudorca crassidens* and Risso's dolphins *Grampus griseus*. *Journal of Experimental Biology* **207**:1811–1823.
- Marba, N., and C. M. Duarte. 2010. Mediterranean warming triggers seagrass (*Posidonia oceanica*) shoot mortality. *Global Change Biology* **16**:2366–2375.
- Marques, L. V., and J. C. Creed. 2000. Biologia e ecologia das Fanérogamas marinhas do Brazil. *Oecologia Brasiliensis* **12**:315–331.
- Martin, G. R. 1986. Sensory capacities and the nocturnal habitat of owls (*Strigiformes*). *Ibis* **128**:266–277.
- Martinez, A. S. 2008. Distribuição e abundância da malacofauna epibentônica no parracho de Maracajaú, RN, Brasil. Universidade federal do Rio Grande do norte centro de biociências, Natal, RN Brazil.
- Masih, I., S. Maskey, F. E. F. Mussa, and P. Trambauer. 2014. A review of droughts on the African continent: a geospatial and long-term perspective. *Hydrology and Earth System Sciences*
- Massa, S. I., S. Arnaud-Haond, G. A. Pearson, and E. A. Serrao. 2009. Temperature tolerance and survival of intertidal populations of the seagrass *Zostera noltii* (Hornemann) in Southern Europe (Ria Formosa, Portugal). *Hydrobiologia* **619**:195–201.
- McFadden, K. W., R. N. Sambrotto, R. A. Medellin, and M. E. Gompper. 2006. Feeding habits of endangered pygmy raccoons (*Procyon pygmaeus*) based on stable isotope and fecal analyses. *Journal of Mammalogy* **87**:501–509.
- McKinnon, A. D., A. Williams, J. Young, D. Ceccarelli, P. Dunstan, R. J. W. Brewin, R. Watson, R. Brinkman, M. Cappel, S. Duggan, R. Kelley, K. Ridgway, D. Lindsay, D. Gledhill, T. Hutton, and A. J. Richardson. 2014. Tropical marginal seas: Priority regions for managing marine biodiversity and ecosystem function. *Annual Review of Marine Science* **6**:415–437.
- McKinnon, J. G., P. E. Gribben, A. R. Davis, D. F. Jolley, and J. T. Wright. 2009. Differences in soft-sediment macrobenthic assemblages invaded by *Caulerpa taxifolia* compared to uninvaded habitats. *Marine Ecology-Progress Series* **380**:59–71.
- Meerhoff, M., C. Iglesias, F. T. De Mello, J. M. Clemente, E. Jensen, T. L. Lauridsen, and E. Jeppesen. 2007. Effects of habitat complexity on community structure and predator avoidance behaviour of littoral zooplankton in temperate versus subtropical shallow lakes. *Freshwater Biology* **52**: 1009–1021.
- Meyer, E., B. Nilkerd, E. A. Glover, and J. D. Taylor. 2008. Ecological importance of chemoautotrophic lucinid bivalves in a peri-mangrove community in eastern Thailand. *Raffles Bulletin of Zoology* **18**:41–55.
- Mikkelsen, P. M., P. S. Mikkelsen, and D. J. Karlen. 1995. Molluscan biodiversity in the Indian river lagoon, Florida. *Bulletin of Marine Science* **57**:94–127.
- Miller-Struttmann, N. E., J. C. Geib, J. D. Franklin, P. G. Kevan, R. M. Holdo, D. Ebert-May, A. M. Lynn, J. A. Kettenbach, E. Hedrick, and C. Galen. 2015. Functional mismatch in a bumble bee pollination mutualism under climate change. *Science* **349**:1541–1544.

- Miller, L. A., and A. Surlykke. 2001. How some insects detect and avoid being eaten by bats: tactics and countertactics of prey and predator. *Bioscience* **51**:570–581.
- Monnat, J. Y. 1970. Introduction à l'étude de la reproduction chez *Lucinoma borealis* (Linné), Bivalvia, Lucinacea. Faculté de Science, Brest.
- Moore, H. B., L. T. Davies, T. H. Fraser, R. H. Gore, and N. R. Lopez. 1968. Some biomass figures from a tidal flat in Biscayne bay, Florida. *Bulletin of Marine Science* **18**:261–&.
- Mun, J., and H. Chun. 2014. Effective simultaneous confidence bands for repeated measurements in linear mixed-effect models. *Journal of Statistical Computation and Simulation* **84**:1748–1760.

N

- Nagarajan, R., S. E. G. Lea, and J. D. Goss-Custard. 2006. Seasonal variations in mussel, *Mytilus edulis* L. shell thickness and strength and their ecological implications. *Journal of Experimental Marine Biology and Ecology* **339**:241–250.
- Nagelkerken, I. 2009. Ecological connectivity among tropical coastal ecosystems. Springer Science and Business Media, Dordrecht.
- Nakaoka, M., H. Mukai, and S. Chunhabundit. 2002. Impacts of dugong foraging on benthic animal communities in a Thailand seagrass bed. *Ecological Research* **17**:625–638.
- Nebel, S., D. L. Jackson, and R. W. Elner. 2005. Functional association of bill morphology and foraging behaviour in calidrid sandpipers. *Animal Biology* **55**:235–243.
- Nicolaev, S., and T. Zaharia. 2011. Report on the state of the marine and coastal environment in 2010. NIMRD, Constanta, Romania.
- Njau, L. N., and W. M. Thiaw. 2011. Western Africa. in "State of the Climate in 2010" *Bulletin of the American Meteorological Society* **92**:S1–S266.
- Njau, L. N., and W. M. Thiaw. 2012. Western Africa. in "State of the Climate in 2011". *Bulletin of the American Meteorological Society* **93**:S1–S264.
- NOAA/OAR/ESRL/PSD. Monthly sea surface temperature means 2011. NOAA/OAR/ESRL/PSD, Boulder, Colorado, USA.

O

- Oehm, J., A. Juen, K. Nagiller, S. Neuhauser, and M. Traugott. 2011. Molecular scatology: how to improve prey DNA detection success in avian faeces? *Molecular Ecology Resources* **11**:620–628.
- Olf, H., D. Alonso, M. P. Berg, B. K. Eriksson, M. Loreau, T. Piersma, and N. Rooney. 2009. Parallel ecological networks in ecosystems. *Philosophical Transactions of the Royal Society B-Biological Sciences* **364**:1755–1779.
- Onrust, J., J. de Fouw, T. Oudman, M. van der Geest, T. Piersma, and J. A. van Gils. 2013. Red Knot diet reconstruction revisited: context dependence revealed by experiments at Banc d'Arguin, Mauritania. *Bird Study* **60**:298–307.
- Orth, R. J. 1973. Benthic infauna of eelgrass, *Zostera marina*, beds. *Chesapeake Bay Science* **14**:258–269.
- Orth, R. J., T. J. B. Carruthers, W. C. Dennison, C. M. Duarte, J. W. Fourqurean, K. L. Heck, A. R. Hughes, G. A. Kendrick, W. J. Kenworthy, S. Olyarnik, F. T. Short, M. Waycott, and S. L. Williams. 2006. A global crisis for seagrass ecosystems. *Bioscience* **56**:987–996.
- Orth, R. J., K. L. Heck, and J. van Montfrans. 1984. Faunal communities in seagrass beds: A review of the influence of plant structure and prey characteristics on predator-prey relationships. *Estuaries and Coasts* **7**:339–350.
- Otero, O. A., and L. J. Romani. 2009. Macroinvertebrados asociados a pastos marinos (*Thalassia testudinum*) en el golfo de Morrosquillo (Zone de Berrugas) Departamento de Sucre. Universidad de Sucre, Sincelejo, Columbia.
- Otoni, E. B. 2000. EthoLog 2.2: A tool for the transcription and timing of behavior observation sessions. *Behavior Research Methods Instruments & Computers* **32**:446–449.
- Oudman, T., J. Onrust, J. de Fouw, B. Spaans, T. Piersma, and J. A. van Gils. 2014. Digestive capacity and toxicity cause mixed diets in red knots that maximize energy intake rate. *The American Naturalist* **183**:650–659.

P

- Paine, R. T. 1980. Food webs: Linkage, interactions strength and community infrastructure. *Journal of Animal Ecology* **49**:667–685.
- Paulay. 2000. Benthic ecology and biota of Tarawa Atoll lagoon: Influence of equatorial upwelling, circulation and human harvest. *Atoll Research Bulletin* **487**:1–41.
- Pearson, P. N., P. W. Ditchfield, J. Singano, K. G. Harcourt-Brown, C. J. Nicholas, R. K. Olsson, N. J. Shackleton, and M. A. Hall. 2001. Warm tropical sea surface temperatures in the Late Cretaceous and Eocene epochs. *Nature* **413**:481–487.
- Peralta, G., J. L. Perez-Llorens, I. Hernandez, F. Brun, J. J. Vergara, A. Bartual, J. A. Galvez, and C. M. Garcia. 2000. Morphological and physiological differences between two morphotypes of *Zostera noltii* Hornem. from the south-western Iberian Peninsula. *Helgoland Marine Research* **54**:80–86.
- Peterson, C. H. 1982. Clam predation by whelks: Experimental tests of the importance of prey size, prey density, and seagrass cover. *Marine Biology* **66**:159–170.
- Philippart, C. J. M. 1995. Seasonal variation in growth and biomass of an intertidal *Zostera noltii* stand in the Dutch Wadden Sea. *Netherlands Journal of Sea Research* **33**:205–218.
- Piersma, T. 1991. Red Knots in New Zealand eat molluscs too: Preliminary diet observations at Miranda, Firth of Thames and Farewell Spit in November 1990. *Stilt* **19**:30–35.
- Piersma, T. 1994. Close to the edge: energetic bottlenecks and the evolution of migratory pathways in knots. PhD thesis. University of Groningen.
- Piersma, T. 2007. Using the power of comparison to explain habitat use and migration strategies of shorebirds worldwide. *Journal of Ornithology* **148**:S45–S59.
- Piersma, T. 2011. From spoonbill to Spoon-billed Sandpiper: the perceptual dimensions to the niche. *Ibis* **153**:659–661.
- Piersma, T. 2012. What is habitat quality? Dissecting a research portfolio on shorebirds. Pages 383–407 in R. J. Fuller, editor. *Birds and Habitat: Relationships in Changing Landscapes*. Cambridge University Press, Cambridge, UK.
- Piersma, T., and N. C. Davidson. 1992. The migration of knots. *Wader study group bulletin* **64**:1–209.
- Piersma, T., P. de Goeij, and I. Tulp. 1993a. An evaluation of intertidal feeding habitats from a shorebird perspective - Towards relevant comparisons between temperate and tropical mudflats. *Netherlands Journal of Sea Research* **31**:503–512.
- Piersma, T., A. Dekinga, J. A. v. Gils, B. Achterkamp, and G. H. Visser. 2003. Cost-benefit analysis of mollusc eating in a shorebird I. Foraging and processing costs estimated by the doubly labelled water method. *Journal of Experimental Biology* **206**:3361–3368.
- Piersma, T., A. Koolhaas, and A. Dekinga. 1993b. Interactions between stomach structure and diet choice in shorebirds. *The Auk* **110**:552–564.
- Piersma, T., and Å. Lindström. 2004. Migrating shorebirds as integrative sentinels of global environmental change. *Ibis* **146**:S61–S69.
- Piersma, T., G. B. Pearson, R. Hickey, S. Dittmann, D. I. Rogers, E. Folmer, P. Honkoop, J. Drent, P. de Goeij, and L. March. 2006. Roebuck Bay invertebrate and bird mapping 2006. Royal Netherlands Institute for Sea Research Texel, The Netherlands.
- Piersma, T., P. Prokosch, and B. Bredin. 1992. The migration system of Afro-Siberian Knots *Calidris canutus canutus*. *Wader study group bulletin* **64**:52–63.
- Piersma, T., D. I. Rogers, P. M. Gonzalez, L. Zwartz, L. J. Niles, I. de Lima S.do Nascimento, C. D. T. Minton, and A. J. Baker. 2005. Fuel storage rates before northward flights in red knots worldwide: facing the severest ecological constraint in tropical intertidal environments? Pages 262–273 in R. Greenberg and P. P. Marra, editors. *Birds of two worlds: ecology and evolution of migration*. Johns Hopkins University Press, Baltimore.
- Piersma, T., R. van Aelst, K. Kurk, H. Berkhoudt, and L. R. M. Maas. 1998. A new pressure sensory mechanism for prey detection in birds: the use of principles of seabed dynamics? *Proceedings of the Royal Society of London Series B-Biological Sciences* **265**:1377–1383.
- Piersma, T., and J. A. van Gils. 2011. *The Flexible Phenotype. A body-centred integration of ecology, physiology, and behaviour*. Oxford University Press Inc, New York.

- Piersma, T., J. A. van Gils, P. de Goeij, and J. van der Meer. 1995. Hollings functional-response model as a tool to link the food-finding mechanism of a probing shorebird with its spatial-distribution. *Journal of Animal Ecology* **64**:493–504.
- Piersma, T., Y. Verkuil, and I. Tulp. 1994. Resources for long-distance migration of knots *Calidris canutus islandica* and *C. c. canutus*. How broad is the temporal exploitation window of benthic prey in the western and eastern Wadden Sea. *Oikos* **71**:393–407.
- Potts, S. G., J. C. Biesmeijer, C. Kremen, P. Neumann, O. Schweiger, and W. E. Kunin. 2010. Global pollinator declines: trends, impacts and drivers. *Trends in Ecology & Evolution* **25**:345–353.
- Power, M. E. 1992. Top-down and bottom-up forces in food webs: Do plants have primacy? *Ecology* **73**:733–746.
- Pranovi, F., D. Curiel, A. Rismondo, M. Marzocchi, and M. Scatolin. 2000. Variations of the macrobenthic community in a seagrass transplanted area of the Lagoon of Venice. *Scientia Marina* **64**:303–310.
- Price, M. H. H., C. Darimont, N. N. Winchester, and P. C. Paquet. 2005. Facts from faeces: Prey remains in wolf, *Canis lupus*, faeces revise occurrence records for mammals of British Columbia's coastal archipelago. *Canadian Field-Naturalist* **119**:192–196.
- Putman, R. J. 1984. Facts from feces. *Mammal Review* **14**:79–97.

Q

- Quezada, V. F., A. C. Jiménez, J. E. H. Díaz, E. E. Hoeflich, D. G. Carbonell, and T. C. Luhrs. 2004. Programa de manejo parque nacional Arrecifes de Xcalak. Mexico National Protected Areas Commission, Mexico City, Mexico.

R

- R Development Core Team. 2014. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.
- Reise, K. 1985. Tidal flat ecology: an experimental approach to species interactions. Springer-Verlag, New York.
- Reneerkens, J. 2007. Functional aspects of seasonal variation in preen wax composition of sandpipers (*Scolopacidae*). PhD thesis. University of Groningen.
- Reynolds, L. K., P. Berg, and J. C. Ziemann. 2007. Lucinid clam influence on the biogeochemistry of the seagrass *Thalassia testudinum* sediments. *Estuaries and Coasts* **30**:482–490.
- Rinaldi, S., and S. Muratori. 1992a. Limit cycles in slow-fast forest-pest models. *Theoretical Population Biology* **41**:26–43.
- Rinaldi, S., and S. Muratori. 1992b. Slow-fast limit cycles in predator-prey models. *Ecological Modelling* **61**:287–308.
- Rinaldi, S., and M. Scheffer. 2000. Geometric analysis of ecological models with slow and fast processes. *Ecosystems* **3**:507–521.
- Ripple, W. J., E. J. Larsen, R. A. Renkin, and D. W. Smith. 2001. Trophic cascades among wolves, elk and aspen on Yellowstone National Park's northern range. *Biological Conservation* **102**:227–234.
- Rodolfo-Metalpa, R., F. Houlbreque, E. Tambutte, F. Boisson, C. Baggini, F. P. Patti, R. Jeffree, M. Fine, A. Foggo, J. P. Gattuso, and J. M. Hall-Spencer. 2011. Coral and mollusc resistance to ocean acidification adversely affected by warming. *Nature Climate Change* **1**:308–312.
- Rueda, J. L., and C. Salas. 2008. Molluscs associated with a subtidal *Zostera marina* L. bed in southern Spain: Linking seasonal changes of fauna and environmental variables. *Estuarine Coastal and Shelf Science* **79**:157–167.
- Ryer, C. H. 1988. Pipefish foraging. Effects of fish size, prey size and altered habitat complexity. *Marine Ecology Progress Series* **48**:37–45.

S

- Sand-Jensen, K., O. Pedersen, T. Binzer, and J. Borum. 2005. Contrasting oxygen dynamics in the freshwater isoetid *Lobelia dortmanna* and the marine seagrass *Zostera marina*. *Annals of Botany* **96**:613–623.

REFERENCES

- Sanders, D., C. G. Jones, E. Thébault, T. J. Bouma, T. van der Heide, J. van Belzen, and S. Barot. 2014. Integrating ecosystem engineering and food webs. *Oikos* **123**:513–524.
- Scheffer, M., S. Carpenter, J. A. Foley, C. Folke, and B. Walker. 2001. Catastrophic shifts in ecosystems. *Nature* **413**:591–596.
- Scheffer, M., M. Hirota, M. Holmgren, E. H. Van Nes, and F. S. Chapin. 2012. Thresholds for boreal biome transitions. *Proceedings of the National Academy of Sciences of the United States of America* **109**:21384–21389.
- Scheffer, M., S. H. Hosper, M. L. Meijer, B. Moss, and E. Jeppesen. 1993. Alternative equilibria in shallow lakes. *Trends in Ecology & Evolution* **8**:275–279.
- Scheiffarth, G. 2001. The diet of Bar-tailed Godwits *Limosa lapponica* in the Wadden Sea: Combining visual observations and faeces analyses. *Ardea* **89**:481–494.
- Schnitzler, H. U., and E. K. V. Kalko. 2001. Echolocation by insect-eating bats: We define four distinct functional groups of bats and find differences in signal structure that correlate with the typical echolocation tasks faced by each group. *Bioscience* **51**:557–569.
- Schwarz, A. M., M. Morrison, I. Hawes, and H. J. 2006. Physical and biological characteristics of a rare marine habitat: sub-tidal seagrass beds of offshore islands. *Science for Conservation* **269**:5–39.
- Schweimanns, M., and H. Felbeck. 1985. Significance of the occurrence of chemoautotrophic bacterial endosymbionts in lucinid clams from Bermuda. *Marine Ecology-Progress Series* **24**:113–120.
- Seager, R., A. Hooks, A. P. Williams, B. Cook, J. Nakamura, and N. Henderson. 2015. Climatology, variability, and trends in the U.S. vapor pressure deficit, an important fire-related meteorological quantity. *Journal of Applied Meteorology and Climatology* **54**:1121–1141.
- Seddon, S., R. M. Connolly, and K. S. Edyvane. 2000. Large-scale seagrass dieback in northern Spencer Gulf, South Australia. *Aquatic Botany* **66**:297–310.
- Sfriso, A., T. Birkemeyer, and P. F. Ghetti. 2001. Benthic macrofauna changes in areas of Venice lagoon populated by seagrasses or seaweeds. *Marine Environmental Research* **52**:323–349.
- Sheppard, S. K., and J. D. Harwood. 2005. Advances in molecular ecology: tracking trophic links through predator-prey food-webs. *Functional Ecology* **19**:751–762.
- Short, F. T., and H. A. Neckles. 1999. The effects of global climate change on seagrasses. *Aquatic Botany* **63**:169–196.
- Siebert, T., and G. M. Branch. 2005. Interactions between *Zostera capensis* and *Callianassa kraussi*: influences on community composition of eelgrass beds and sandflats. *African Journal of Marine Science* **27**:357–373.
- Sih, A. 1997. To hide or not to hide? Refuge use in a fluctuating environment. *Trends in Ecology & Evolution* **12**:375–376.
- Silliman, B. R., J. van de Koppel, M. D. Bertness, L. E. Stanton, and I. A. Mendelssohn. 2005. Drought, snails, and large-scale die-off of southern US salt marshes. *Science* **310**:1803–1806.
- Sleath, J. F. A. 1984. *Sea bed mechanics*. Wiley, New York, NY.
- Sleep, D. J. H., and R. M. Brigham. 2003. An experimental test of clutter tolerance in bats. *Journal of Mammalogy* **84**:216–224.
- Smith, S. E., and D. J. Read. 1997. *Mycorrhizal Symbiosis*. Academic Press, San Diego, CA.
- Song, C., C. E. Woodcock, K. C. Seto, M. P. Lenney, and S. A. Macomber. 2001. Classification and change detection using Landsat TM data: When and how to correct atmospheric effects? *Remote Sensing of Environment* **75**:230–244.
- Sprugel, D. G. 1983. Correcting for bias in Log-transformed allometric equations. *Ecology* **64**:209–210.
- Stachowicz, J. J. 2001. Mutualism, facilitation, and the structure of ecological communities. *Bioscience* **51**:235–246.
- Stachowicz, J. J., and M. E. Hay. 1999. Mutualism and coral persistence: The role of herbivore resistance to algal chemical defense. *Ecology* **80**:2085–2101.
- Stanley, G. D. 2006. Ecology - Photosymbiosis and the evolution of modern coral reefs. *Science* **312**:857–858.
- Stanley, S. M. 1977. Trends, rates and patterns in the evolution of the bivalvia. *in* A. Hallam, editor. *Patterns of evolution as illustrated by the fossil record*. Elsevier, Amsterdam, The Netherlands.

- Stanley, S. M. 2014. Evolutionary radiation of shallow-water *Lucinidae* (Bivalvia with endosymbionts) as a result of the rise of seagrasses and mangroves. *Geology* **42**:803–806.
- Stephens, D. W., and J. R. Krebs. 1986. *Foraging Theory*. Princeton University Press, Princeton, NJ.
- Stewart, F. J., I. L. G. Newton, and C. M. Cavanaugh. 2005. Chemosynthetic endosymbioses: adaptations to oxic-anoxic interfaces. *Trends in Microbiology* **13**:439–448.
- Stoner, A. W., H. S. Greening, J. D. Ryan, and R. J. Livingston. 1983. Comparison of macrobenthos collected with cores and suction sampler in vegetated and unvegetated marine habitats. *Estuaries* **6**:76–82.
- Systat Software Inc. 2010. SigmaPlot. in E. G. a. A. Software, editor.
- T**
- Tan, S. K., and R. K. H. Yeo. 2010. The intertidal molluscs of Pulau Semakau: Preliminary results of "project Semakau" Nature in Singapore **3**:287–296.
- Taylor, J. D., and E. A. Glover. 2000a. Functional anatomy, chemosymbiosis and evolution of the *Lucinidae*. Pages 207–225 in E. M. Harper, J. D. Taylor, and J. A. Crame, editors. *The Evolutionary Biology of the Bivalvia*. The Geological Society of London, London.
- Taylor, J. D., and E. A. Glover. 2000b. Functional anatomy, chemosymbiosis and evolution of the *Lucinidae*. Pages 207–225 in *The evolutionary biology of the Bivalvia*. Geological Society Special Publications, Geological Society, London.
- Taylor, J. D., and E. A. Glover. 2006. *Lucinidae* (Bivalvia) - the most diverse group of chemosymbiotic molluscs. *Zoological Journal of the Linnean Society* **148**:421–438.
- Taylor, J. D., and E. A. Glover. 2008. Ancient chemosynthetic bivalves: Systematics of Solemyidae from eastern and southern Australia (Mollusca: Bivalvia). Pages 75–104 in D. P. J. F. and J. A. Phillips, editors. *Proceedings of the 13th International Marine Biological Workshop - The Marine Fauna and Flora of Moreton Bay, Queensland*. Queensland Museum, South Brisbane, Australia.
- Taylor, J. D., E. A. Glover, L. Smith, P. Dyal, and S. T. Williams. 2011. Molecular phylogeny and classification of the chemosymbiotic bivalve family *Lucinidae* (Mollusca: Bivalvia). *Zoological Journal of the Linnean Society* **163**:15–49.
- Taylor, J. D., E. A. Glover, M. Zuschin, P. C. Dworschak, and W. Waitzbauer. 2005. Another bivalve with dreadlocks: Living *Rasta lamyi* from Aqaba, Red Sea (Bivalvia: *Lucinidae*). *Journal of Conchology* **38**:489–497.
- Taylor, J. D., and M. S. Lewis. 1970. The flora, fauna and sediments of the marine grass beds of Mahé, Seychelles. *Journal of Natural History* **4**:199–8.
- Teillet, P. M., B. L. Markham, and R. R. Irish. 2006. Landsat cross-calibration based on near simultaneous imaging of common ground targets. *Remote Sensing of Environment* **102**:264–270.
- Terborgh, J., and J. A. Estes, editors. 2010. *Trophic cascades. Predators, prey, and the changing dynamics of nature*. Island Press.
- Terborgh, J., G. Nunez-Iturri, N. C. A. Pitman, F. H. C. Valverde, P. Alvarez, V. Swamy, E. G. Pringle, and C. E. T. Paine. 2008. Tree recruitment in an empty forest. *Ecology* **89**:1757–1768.
- Thomson, J. A., D. A. Burkholder, M. R. Heithaus, J. W. Fourqurean, M. W. Fraser, J. Statton, and G. A. Kendrick. 2015. Extreme temperatures, foundation species, and abrupt ecosystem change: an example from an iconic seagrass ecosystem. *Global Change Biology* **21**:1463–1474.
- Tomkovich, P. S. 1992. An analysis of the geographic variability in Knots *Calidris canutus* based on museum skins. *Wader study group bulletin* **64**:17–23.
- Torra Cosío, J., and L. Bourillón. 2000. Inventario y monitoreo del canal del infiernillo para el comanejo de los recursos marinos en el territorio. SNIB- CONABIO Mexico City.
- Toscano, B. J., and B. D. Griffen. 2013. Predator size interacts with habitat structure to determine the allometric scaling of the functional response. *Oikos* **122**:454–462.
- Tulp, I., and P. Degoeij. 1994. Evaluating wader habitats in Roebuck bay (North-Western Australia) as a springboard for northbound migration in Waders, with a focus in Great knots. *Emu* **94**:78–95.
- Tylianakis, J. M., R. K. Didham, J. Bascompte, and D. A. Wardle. 2008. Global change and species interactions in terrestrial ecosystems. *Ecology Letters* **11**:1351–1363.

V

- Vahl, W. K. 2006. Interference competition among foraging waders. PhD thesis. University of Groningen.
- Valiela, I., J. McClelland, J. Hauxwell, P. J. Behr, D. Hersh, and K. Foreman. 1997. Macroalgal blooms in shallow estuaries: Controls and ecophysiological and ecosystem consequences. *Limnology and Oceanography* **42**:1105–1118.
- Van-Dunem do Sacramento Neto dos Santos, C. I. 2007. Comunidades de macroninvertebrados e peixes associadas à pradaria marinha de *Hadule wrightii* (Ascherson, 1868) na Laguno do Mussulo, Angola. Universidade de Lisboa, Lisboa.
- van de Kam, J., B. J. Ens, T. Piersma, and L. Zwartz. 2004. Shorebirds. An illustrated behavioural ecology. KNNV Publishers is a foundation of the Royal Dutch Society for Natural History.
- van de Koppel, J., T. van der Heide, A. H. Altieri, B. K. Eriksson, T. J. Bouma, H. Olf, and B. R. Silliman. 2015. Long-distance interactions regulate the structure and resilience of coastal ecosystems. *Annual Review of Marine Science* **7**:139–158.
- van den Hout, P. J. 2010. Struggle for safety. Adaptive responses of wintering waders to their avian predators. PhD thesis. University of Groningen.
- van der Geest, M. 2013. Multi-trophic interactions within the seagrass beds of Banc d'Arguin, Mauritania. A chemosynthesis-based intertidal ecosystem. PhD thesis. University of Groningen.
- van der Geest, M., A. A. Sall, S. O. Ely, R. W. Nauta, J. A. van Gils, and T. Piersma. 2014. Nutritional and reproductive strategies in a chemosymbiotic bivalve living in a tropical intertidal seagrass bed. *Marine Ecology Progress Series* **501**:113–126.
- van der Geest, M., J. A. van Gils, J. van der Meer, H. Olf, and T. Piersma. 2011. Suitability of calcein as an in situ growth marker in burrowing bivalves. *Journal of Experimental Marine Biology and Ecology* **399**:1–7.
- van der Heide, T., T. J. Bouma, E. H. van Nes, J. van de Koppel, M. Scheffer, J. G. M. Roelofs, M. M. van Katwijk, and A. J. P. Smolders. 2010a. Spatial self-organized patterning in seagrasses along a depth gradient of an intertidal ecosystem. *Ecology* **91**:362–369.
- van der Heide, T., J. S. Eklöf, E. H. van Nes, E. M. van der Zee, S. Donadi, E. J. Weerman, H. Olf, and B. K. Eriksson. 2012a. Ecosystem engineering by seagrasses interacts with grazing to shape an intertidal landscape. *PLoS ONE* **7**:e42060.
- van der Heide, T., L. L. Govers, J. de Fouw, H. Olf, M. van der Geest, M. M. van Katwijk, T. Piersma, J. van de Koppel, B. R. Silliman, A. J. P. Smolders, and J. A. van Gils. 2012b. A three-stage symbiosis forms the foundation of seagrass ecosystems. *Science* **336**:1432–1434.
- van der Heide, T., E. T. H. M. Peeters, D. C. R. Hermus, M. M. van Katwijk, J. G. M. Roelofs, and A. J. P. Smolders. 2009. Predicting habitat suitability in temperate seagrass ecosystems. *Limnology and Oceanography* **54**:2018–2024.
- van der Heide, T., A. Smolders, B. Rijkens, E. van Nes, M. van Katwijk, and J. Roelofs. 2008. Toxicity of reduced nitrogen in eelgrass (*Zostera marina*) is highly dependent on shoot density and pH. *Oecologia* **158**:411–419.
- van der Heide, T., E. H. van Nes, G. W. Geerling, A. Smolders, T. J. Bouma, and M. van Katwijk. 2007. Positive feedbacks in seagrass ecosystems: Implications for success in conservation and restoration. *Ecosystems* **10**:1311–1322.
- van der Heide, T., E. H. van Nes, M. M. van Katwijk, H. Olf, and A. J. P. Smolders. 2011. Positive feedbacks in seagrass ecosystems – Evidence from large-scale empirical data. *PLoS ONE* **6**:e16504.
- van der Heide, T., E. H. van Nes, M. M. van Katwijk, M. Scheffer, A. J. Hendriks, and A. J. P. Smolders. 2010b. Alternative stable states driven by density-dependent toxicity. *Ecosystems* **13**:841–850.
- van der Heijden, M. G. A., R. D. Bardgett, and N. M. van Straalen. 2008. The unseen majority: soil microbes as drivers of plant diversity and productivity in terrestrial ecosystems. *Ecology Letters* **11**:296–310.
- van der Heijden, M. G. A., J. N. Klironomos, M. Ursic, P. Moutoglis, R. Streitwolf-Engel, T. Boller, A. Wiemken, and I. R. Sanders. 1998. Mycorrhizal fungal diversity determines plant biodiversity, ecosystem variability and productivity. *Nature* **396**:69–72.
- van der Meer, J. 1992. Statistical-analysis of the dichotomous preference test. *Animal Behaviour* **44**:1101–1106.

- van der Meer, J., J. J. Beukema, and R. Dekker. 2001. Long-term variability in secondary production of an intertidal bivalve population is primarily a matter of recruitment variability. *Journal of Animal Ecology* **70**:159–169.
- van der Zee, E. M., T. van der Heide, S. Donadi, J. S. Eklof, B. K. Eriksson, H. Olff, H. W. van der Veer, and T. Piersma. 2012. Spatially extended habitat modification by intertidal reef-building bivalves has implications for consumer-resource interactions. *Ecosystems* **15**:664–673.
- van Gils, J. A. 2004. Foraging decisions in a digestively constrained long-distance migrant, the red knot *Calidris canutus*. PhD thesis. University of Groningen.
- van Gils, J. A., and M. V. Ahmedou Salem. 2015. Validating the incorporation of 13C and 15N in a shorebird that consumes an isotopically distinct chemosymbiotic bivalve. *PLoS ONE* **10**:e0140221.
- van Gils, J. A., P. F. Battley, T. Piersma, and R. Drent. 2005a. Reinterpretation of gizzard sizes of red knots world-wide emphasises overriding importance of prey quality at migratory stopover sites. *Proceedings of the Royal Society B-Biological Sciences* **272**:2609–2618.
- van Gils, J. A., S. R. de Rooij, J. van Belle, J. van der Meer, A. Dekinga, T. Piersma, and R. Drent. 2005b. Digestive bottleneck affects foraging decisions in red knots *Calidris canutus*. I. Prey choice. *Journal of Animal Ecology* **74**:105–119.
- van Gils, J. A., A. Dekinga, B. Spaans, W. K. Vahl, and T. Piersma. 2005c. Digestive bottleneck affects foraging decisions in red knots *Calidris canutus*. II. Patch choice and length of working day. *Journal of Animal Ecology* **74**:120–130.
- van Gils, J. A., S. Lisovski, W. Meissner, T. Lok, A. Ozarowska, J. de Fouw, M. Y. Soloviev, T. Piersma, and M. Klaassen. submitted. A long-distance migrant pays the bill for Arctic warming while wintering in the tropics.
- van Gils, J. A., and T. Piersma. 2004. Digestively constrained predators evade the cost of interference competition. *Journal of Animal Ecology* **73**:386–398.
- van Gils, J. A., T. Piersma, A. Dekinga, and P. F. Battley. 2006a. Modelling phenotypic flexibility: an optimality analysis of gizzard size in Red Knots *Calidris canutus*. *Ardea* **94**:409–420.
- van Gils, J. A., T. Piersma, A. Dekinga, and M. W. Dietz. 2003a. Cost-benefit analysis of mollusc-eating in a shorebird II. Optimizing gizzard size in the face of seasonal demands. *Journal of Experimental Biology* **206**:3369–3380.
- van Gils, J. A., T. Piersma, A. Dekinga, B. Spaans, and C. Kraan. 2006b. Shellfish dredging pushes a flexible avian top predator out of a marine protected area. *Plos Biology* **4**:2399–2404.
- van Gils, J. A., I. W. Schenk, O. Bos, and T. Piersma. 2003b. Incompletely informed shorebirds that face a digestive constraint maximize net energy gain when exploiting patches. *American Naturalist* **161**:777–793.
- van Gils, J. A., B. Spaans, A. Dekinga, and T. Piersma. 2006c. Foraging in a tidally structured environment by red knots (*Calidris canutus*): Ideal, but not free. *Ecology* **87**:1189–1202.
- van Gils, J. A., M. van der Geest, B. De Meulenaer, H. Gillis, T. Piersma, and E. O. Folmer. 2015. Moving on with foraging theory: incorporating movement decisions into the functional response of a gregarious shorebird. *Journal of Animal Ecology* **84**:554–564.
- van Gils, J. A., M. van der Geest, E. J. Jansen, L. L. Govers, J. de Fouw, and T. Piersma. 2012. Trophic cascade induced by molluscivore predator alters pore-water biogeochemistry via competitive release of prey. *Ecology* **93**:1143–1152.
- van Gils, J. A., M. van der Geest, C. Kraan, E. O. Folmer, E. J. Jansen, and T. Piersma. 2009. Hoe de draagkracht van de Waddenzee vogelaantallen op de Banc d'Arguin beperkt. *Limosa* **82**:134–140.
- van Gils, J. A., M. van der Geest, J. Leyrer, T. Oudman, T. Lok, J. Onrust, J. de Fouw, T. van der Heide, P. J. van den Hout, B. Spaans, A. Dekinga, M. Brugge, and T. Piersma. 2013. Toxin constraint explains diet choice, survival and population dynamics in a molluscivore shorebird. *Proceedings of the Royal Society B-Biological Sciences* **280**:20130861.
- van Lent, F., P. H. Nienhuis, and J. M. Verschuure. 1991. Production and biomass of the seagrasses *Zostera noltii* Hornem. and *Cymodocea nodosa* (Ucria) Aschers. at the Banc d'Arguin (Mauritania, NW Africa): a preliminary approach. *Aquatic Botany* **41**:353–367.
- van Nes, E. H., M. Hirota, M. Holmgren, and M. Scheffer. 2014. Tipping points in tropical tree cover: linking theory to data. *Global Change Biology* **20**:1016–1021.

- van Nes, E. H., W. J. Rip, and M. Scheffer. 2007. A theory for cyclic shifts between alternative states in shallow lakes. *Ecosystems* **10**:17–27.
- van Roomen M., Nagy S., Foppen R., Dodman T., Citegetse G. & Ndiaye A. 2015. Status of coastal water-bird populations in the East Atlantic Flyway. With special attention to flyway populations making use of the Wadden Sea. Programme Rich Wadden Sea, Leeuwarden, The Netherlands, Sovon, Nijmegen, The Netherlands, Wetlands International, Wageningen, The Netherlands, BirdLife International, Cambridge, United Kingdom & Wadden Sea Secretariat, Wilhelmshaven, Germany.
- Van Valen, L. 1973. A new evolutionary law. *Evolution Theory* **1**:1–30.
- Vermaat, J. E., J. A. J. Beijer, R. Gijlstra, M. J. M. Hootsmans, C. J. M. Philippart, N. W. Vandenbrink, and W. Vanvierssen. 1993. Leaf dynamics and standing stocks of internal *Zostera noltii* Hornem and *Cymodocea nodosa* (Ucria) Ascherson on Banc d'Arguin, Mauritania. *Hydrobiologia* **285**:59–72.
- Vermaat, J. E., and F. C. A. Verhagen. 1996. Seasonal variation in the intertidal seagrass *Zostera noltii* Hornem: Coupling demographic and physiological patterns. *Aquatic Botany* **52**:259–281.
- Vermeij, G. J. 1987. *Evolution and Escalation: An Ecological History of Life*. Princeton University Press, Princeton.
- Vermeij, G. J. 2011. Shifting sources of productivity in the coastal marine tropics during the Cenozoic era. *Proceedings of the Royal Society B-Biological Sciences* **287**:2362–2368.
- Vitousek, P. M., J. D. Aber, R. W. Howarth, G. E. Likens, P. A. Matson, D. W. Schindler, W. H. Schlesinger, and D. Tilman. 1997. Human alteration of the global nitrogen cycle: Sources and consequences. *Ecological Applications* **7**:737–750.
- Vonk, J. A., M. J. A. Christianen, and J. Stapel. 2008. Redefining the trophic importance of seagrasses for fauna in tropical Indo-Pacific meadows. *Estuarine Coastal and Shelf Science* **79**:653–660.
- Vucic-Pestic, O., K. Birkhofer, B. C. Rall, S. Scheu, and U. Brose. 2010. Habitat structure and prey aggregation determine the functional response in a soil predator-prey interaction. *Pedobiologia* **53**: 307–312.
- W**
- Wanink, J., and L. Zwarts. 1985. Does an optimally foraging Oystercatcher obey the functional-response. *Oecologia* **67**:98–106.
- Watson, G. F., A. I. Robertson, and M. J. Littlejohn. 1984. Invertebrate macrobenthos of the seagrass communities in Western Port, Victoria. *Aquatic Botany* **18**:175–&.
- Waycott, M., C. M. Duarte, T. J. B. Carruthers, R. J. Orth, W. C. Dennison, S. Olyarnik, A. Calladine, J. W. Fourqurean, K. L. Heck, A. R. Hughes, G. A. Kendrick, W. J. Kenworthy, F. T. Short, and S. L. Williams. 2009. Accelerating loss of seagrasses across the globe threatens coastal ecosystems. *Proceedings of the National Academy of Sciences of the United States of America* **106**: 12377–12381.
- Weerman, E. J., J. Van Belzen, M. Rietkerk, S. Temmerman, S. Kefi, P. M. J. Herman, and J. Van de Koppel. 2012. Changes in diatom patch-size distribution and degradation in a spatially self-organized intertidal mudflat ecosystem. *Ecology* **93**:608–618.
- Whanpetch, N. 2011. Variability and consequences of seagrass vegetation effect on macrobenthic invertebrate communities. Chiba University, Chiba, Japan.
- Whitfield, A. K. 1989. The benthic community of the Southern Cape estuary - Structure and possible food sources. *Transactions of the Royal Society of South Africa* **47**:159–179.
- Wilson, C. J., P. S. Wilson, C. A. Greene, and K. H. Dunton. 2013. Seagrass meadows provide an acoustic refuge for estuarine fish. *Marine Ecology Progress Series* **472**:117–127.
- Wolff, W. J., A. G. Duiven, P. Duiven, P. Esselink, A. Gueye, A. Meijboom, G. Moerland, and J. Zegers. 1993. Biomass of macrobenthic tidal flat fauna of the Banc d'Arguin, Mauritania. *Hydrobiologia* **258**:151–163.
- Wolff, W. J., and C. J. Smit. 1990. The Banc d'Arguin, Mauritania, as an environment for coastal birds. *Ardea* **78**:17–38.
- Wood, E. D., F. J. A. Armstrong, and F. A. Richards. 1967. Determination of nitrate in sea water by cadmium-copper reduction to nitrite. *Journal of the Marine Biological Association of the United Kingdom* **47**:23–31.
- Worm, B., H. K. Lotze, H. Hillebrand, and U. Sommer. 2002. Consumer versus resource control of species diversity and ecosystem functioning. *Nature* **417**:848–851.

Y

- Yamaguchi, M. 1999. Edible mollusks from tropical seagrass-beds in the Indo-Pacific – past and present. Page 217 in M. B., editor. Asian Marine Biology. University Press, Hong Kong
- Yang, H.-Y., B. Chen, Z.-j. Ma, N. Hua, J. A. van Gils, Z.-W. Zhang, and T. Piersma. 2013. Economic design in a long-distance migrating molluscivore: how fast-fuelling red knots in Bohai Bay, China, get away with small gizzards. *The Journal of Experimental Biology* **216**:3627–3636.

Z

- Zuschin, M., and J. Hohenegger. 1998. Subtropical coral-reef associated sedimentary facies characterized by molluscs (Northern bay of Safaga, Red Sea, Egypt). *Facies* **38**:229–254.
- Zwarts, L. 1997. Waders and their estuarine food supplies. University of Groningen, Groningen.
- Zwarts, L., and A. M. Blomert. 1992. Why knot *Calidris canutus* take medium-sized *Macoma balthica* when 6 prey species are available. *Marine Ecology Progress Series* **83**:113–128.
- Zwarts, L., A. M. Blomert, B. J. Ens, R. Hupkes, and T. M. van spanje. 1990. Why do waders reach high feeding densities on the intertidal flats of Banc d'Arguin, Mauritania. *Ardea* **78**:39–52.
- Zwarts, L., and J. Wanink. 1989. Siphon size and burying depth in deposit- and suspension-feeding benthic bivalves. *Marine Biology* **100**:227–240.
- Zwarts, L., and J. H. Wanink. 1993. How the food-supply harvestable by waders in the Wadden Sea depends on the variation in energy density, body-weight, biomass, burying depth and behavior of tidal-flat invertebrates. *Netherlands Journal of Sea Research* **31**:441–476.

