

Dr. Laurens Bouwer

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Education

2006-2010: PhD Flood risk and climate change, Vrije Universiteit Amsterdam
(supervisors: P. Vellinga and J.C.J.H. Aerts)
1995-2001: MSc Physical Geography, Vrije Universiteit Amsterdam

Employment record

2018-present	Climate Service Center Germany	Senior Scientist
2013-2018	Deltares	Senior Researcher
2001-2013	Institute for Environmental Studies, VU Amsterdam	Researcher
March-May 2008	University of California, Santa Barbara (UCSB)	Visiting Scientist
Oct 2000-Feb '01	Geoscience Research Group, Munich Re	Intern
1999-2000	Institute for Environmental Studies, VU Amsterdam	Assistant

Languages

	Understanding:	Speaking:	Writing:
Dutch	Mother tongue	Mother tongue	Mother tongue
English	Excellent	Excellent	Excellent
German	Excellent	Excellent	Good
French	Basic	Basic	Basic

Selected recent projects

2018-present **Digital Earth: towards smart monitoring and integrated data exploration in the Earth System**
Client: Helmholtz
Location: Germany
Role: senior scientist, evaluation of indicator frameworks

2017-2018 **European Climate Prediction System (H2020 EUCP)**
Location: The Netherlands, EU
Role: Urban flood risk and adaptation expert, and PhD supervisor

2017-2018 **CO-designing the Assessment of Climate CHange costs (H2020 COACCH)**
Location: The Netherlands, EU
Role: Flood risk and climate impacts expert

2017-2018 **Impacts of accelerated sea-level rise for the Dutch Delta-Programme**
Client: Ministry of Environment and Water Management, Netherlands

- Location: The Netherlands
Role: Flood risk expert
2017-2018 **Long term vulnerability assessment and adaptation plan for the San Francisco Public Utilities Commission Water Enterprise Phase I**
Client: San Francisco Public Utilities Company, Water Enterprise
Location: The Netherlands, USA
Role: Adaptation planning expert
- 2016-2018 **Water management for road authorities in the face of climate Change (WATCH)**
Location: Netherlands, EU
Client: Conference of European Directors of Roads (CEDR)
Role: Hydrological expert
- 2016-2018 **Critical infrastructure and future flood resilience in South Florida (CIFRe)**
Location: United States
Client: NOAA-CPO
Role: Flood risk expert
- 2015-2018 **Improving predictions and management of hydrological extremes (H2020 IMPREX)**
Location: EU, Netherlands
Client: European Commission
Role: Flood risk expert, and PhD supervisor
- 2015-2018 **Green growth and win-win strategies for sustainable climate action (H2020 GREEN-WIN)**
Location: EU, Netherlands
Client: European Commission
Role: Coastal adaptation expert
- 2017 **Assessment of Alternative Flood Mitigation Strategies**
Client: South Florida Water Management District
Location: Florida, USA
Role: Project leader and expert coastal flood risk and sea-level rise
- 2016-2017 **Flood Risk Assessment for Colombo Metropolitan Region**
Location: Netherlands, Sri Lanka
Client: Sri Lanka Ministry of Defence and Urban Development; and World Bank
- 2016-2017 **Supporting Resilience to Coastal Hazards in Vietnam**
Location: Netherlands, Viet Nam
Client: World Bank
- 2015 - 2016 **Afghanistan multi-hazard risk assessment, cost-benefit analysis, and resilient design recommendations**
Location: Afghanistan, Netherlands
Client: World Bank, GFDRR
- 2014-2016 **Flood and drought risk management under climate change: methods for strategy evaluation and cost optimization**
Location: United States, Florida
Client: NOAA-CPO
Role: Project leader
- 2012-2013 **Enhancing risk management partnerships for catastrophic natural disasters in Europe (FP7 ENHANCE)**
Client: European Commission, DG Research (FP7)
Roles: Project Co-coordinator; and Leader Work Package on Risk

- Scenarios
- 2010-2012 **European responses to climate change: deep emissions reductions and mainstreaming of mitigation and adaptation (FP7 RESPONSES)**
Client: European Commission, DG Research (FP7)
Roles: Project Manager; and Leader Work Package on Cohesion Policy
- 2010-2012 **Costs of Natural Hazards (FP7 ConHaz)**
Client: European Commission, DG Research (FP7)
Role: Work Package Leader mitigation and adaptation to natural hazards
- 2009-2012 **Climate change and changes in spatial structures in Flanders (CCASPAR)**
Client: Institute for the Promotion of Innovation by Science and Technology in Flanders (Belgium)
Role: Leader land-use projections, flood risk and adaptation
- 2005-2010 **Financial arrangements for disaster losses under climate change**
Client: BSIK Climate Changes Spatial Planning Programme
Role: Project Leader, modelling of flood risks and damages from extreme weather, development of adaptation strategies for the insurance sector
- 2006-2007 **European Commission Green Paper on climate adaptation**
Client: European Commission, DG Environment
Role: workshops and conference, contribution to draft Green Paper

Journal publications

- Bouwer, L.M. (2018). Next generation coastal risk models. *Nature Climate Change*, 8(9), 765-766.
- Vousdoukas, M.I., Bouziotas, D., Giardino, A., Bouwer, L.M., Mentaschi, L., Voukouvalas, E. & Feyen, L. (2018). Understanding epistemic uncertainty in large-scale coastal flood risk assessment for present and future climates. *Natural Hazards and Earth System Sciences*, 18(8), 2127-2142.
- Wagenaar, D., Lüdtke, S., Bouwer, L.M. & Kreibich, H. (2018). Regional and temporal transferability of multi-variable flood damage models. *Water Resources Research*, 54(5), 3688-3703.
- Dias, P., Arambepola, N.M.S.I., Weerasinghe, K., Weerasinghe, K.D.N., Wagenaar, D., Bouwer, L.M. & Gehrels, H. (2018). Development of damage functions for flood risk assessment in the city of Colombo (Sri Lanka). *Procedia Engineering*, 212, 332-339.
- Bouwer, L.M. & Jonkman, S.N. (2018). Global mortality from storm surges is decreasing. *Environmental Research Letters*, 13(1), 014008.
- Kreibich, H., Di Baldassarre, G., Vorogushyn, S., Aerts, J.C.J.H., Apel, H., Aronica, G.T., Arnbjerg-Nielsen, K., Bouwer, L.M., Bubeck, P., Chinh, D.T., Caloiero, T., Cortès, M., Gain, A.K., Giampá, V., Kuhlicke, C., Kundzewicz, Z.W., Llasat, M.C., Mård, J., Matczak, P., Mazzoleni, M., Molinari, D., Dung, N.V., Petrucci, O., Schröter, K., Slager, K., Thieken, A.H., Ward, P.J. & Merz, B. (2017). Adaptation to flood risk: results of international paired flood event studies. *Earth's Future*, 5(10), 953-965.
- Wagenaar, D., De Jong, J. & Bouwer, L.M. (2017). Multi-variable flood damage modelling with limited data using supervised learning approaches. *Natural Hazards and Earth System Sciences*, 17(9), 1683-1696.

- Surminski, S., Bouwer, L.M. & Linnerooth-Bayer, J. (2016). How insurance can support climate resilience. *Nature Climate Change*, 6(4), 333-334.
- Botzen, W.J.W. & Bouwer, L.M. (2016). Weather indicators for insured hail-storm damage to motor vehicles and potential climate change impacts. *The Geneva Papers on Risk and Insurance: Issues and Practice*, 41(3), 512-527.
- Scussolini, P., Aerts, J.C.J.H., Jongman, B., Bouwer, L.M., Winsemius, H.C., De Moel, H. & Ward, P.J. (2016). FLOPROS: an evolving global database of flood protection standards. *Natural Hazards and Earth System Sciences*, 16(5), 1049 -1061.
- Van den Hurk, B., Bouwer, L.M., Buontempo, C., Döscher, R., Ercin, E., Hananel, C., Hunink, J.E., Kjellström, E., Klein, B., Manez, M., Pappenberger, F., Pouget, L., Ramos, M.H., Ward, P.J., Weerts, A.H. & Wijngaard, J.B. (2016). Improving predictions and management of hydrological extremes through climate services: www.imprex.eu. *Climate Services*, 1(1), 6-11.
- Wagenaar, D., De Bruijn, K.M., Bouwer, L.M. & De Moel, H. (2016). Uncertainty in flood damage estimates and its potential effect on investment decisions. *Natural Hazards and Earth System Sciences*, 16(1), 1-14.
- Mechler, R. & Bouwer, L.M. (2015). Understanding trends and projections of disaster losses and climate change: is vulnerability the missing link? *Climatic Change*, 133(1), 23-35.
- Hanger, S., Haug, C., Lung, T. & Bouwer, L.M. (2015). Mainstreaming climate change in regional development policy in Europe: four insights from the 2007-2013 programming period. *Regional Environmental Change*, 15(6), 973-985.
- Berkhout, F., Bouwer, L.M., Bayer, J., Bouzid, M., Cabeza, M., Hanger, S., Hof, A., Hunter, P., Meller, L., Patt, A., Pfluger, B., Rayner, T., Reichardt, K. & Van Teeffelen, A. (2015). European policy responses to climate change: progress on mainstreaming emissions reduction and adaptation. *Regional Environmental Change*, 15(6), 949-959.
- Kreibich, H., Bouwer, L.M. & Schwarze, R. (2015). Current advances in analysis, modelling and mitigation of the costs of natural hazards. *Natural Hazards and Earth System Sciences*, 15(6), 1157-1162.
- Bouwer, L.M., Papyrakis, E., Poussin, J., Pfürscheller, C. & Thielen, A.H. (2014). The costing of measures for natural hazard mitigation in Europe. *Natural Hazards Review*, 15(4), 04014010.
- Kreibich, H., Van den Bergh, J.C.J.M., Bouwer, L.M., Bubeck, P., Ciavola, P., Green, C., Hallegatte, S., Logar, I., Meyer, V., Schwarze, R. & Thielen, A.H. (2014). Costing natural hazards. *Nature Climate Change*, 4(5), 304-306.
- Mechler, R., Bouwer, L.M., Linnerooth-Bayer, J., Hochrainer-Stigler, S., Aerts, J.C.J.H., Surminski, S. & Williges, K. (2014). Managing unnatural disaster risk from climate extremes. *Nature Climate Change*, 4(4), 235-237.
- Jongman, B., Hochrainer-Stigler, S., Feyen, F., Aerts, J.C.J.H., Mechler, R., Botzen, W.J.W., Bouwer, L.M., Pflug, G., Rojas, R. & Ward, P. (2014). Increasing stress on disaster risk finance due to large floods. *Nature Climate Change*, 4(4), 264-268.
- Merz, B., J. Aerts, J., Arnbjerg-Nielsen, K., Baldi, M., Becker, A., Bichet, A., Blöschl, G., Bouwer, L.M., Brauer, A., Cioffi, F., Delgado, J.M., Gocht, M., Guzzetti, F., Harrigan, S., Hirschboeck, K., Kilsby, C., Kron, W., Lall, U., Merz, R., Nissen, K., Salvatti, P., Swierczynski, T., Ulbrich, U., Viglione, A., Ward, P., Weiler, M., Wilhelm, B. & Nied, M. (2014). Floods and climate: emerging perspectives for flood risk assessment and management. *Natural Hazards and Earth System Sciences*, 14(7), 1921-1942.
- Bouma, J.A., Biggs, T.W. & Bouwer, L.M. (2014). Comment on Garg et al (2012) Up-scaling potential impacts on water flows from agricultural water interventions: opportunities and

- trade-offs in the Osman Sagar catchment, Musi sub-basin, India. *Hydrological Processes*, 28(8), 3350-3351.
- Kundzewicz, Z.W., Kanae, S., Seneviratne, S.I., Handmer, J., Nicholls, N., Peduzzi, P., Mechler, R., Bouwer, L.M., Arnell, N., Mach, K., Muir-Wood, R., Brakenridge, G.R., Kron, W., Honda, Y., Benito, G., Takahashi, K. & Sherstyukov, B. (2014). Changing flood risk: global and regional perspectives. *Hydrological Sciences Journal*, 59(1), 1-28.
- Koks, E.E., De Moel, H., Aerts, J.C.J.H. & Bouwer, L.M. (2014). Effect of spatial adaptation measures on flood risk: study of coastal floods in Belgium. *Regional Environmental Change*, 14(1), 413-425.
- Jacob, D., Petersen, J., Eggert, B., Alias, A., Bossing Christensen, O., Bouwer, L.M., Braun, A., Colette, A., Deque, M., Georgievski, G., Georgopoulou, E., Gobiet, A., Menut, L., Nikulin, G., Haensler, A., Hempelmann, N., Jones, C., Keuler, K., Kovats, S., Kröner, N., Kotlarski, S., Kriegsmann, A., Martin, E., Van Meijgaard, E., Moseley, C., Pfeifer, S., Preuschmann, S., Rademacher, C., Radtke, K., Rechid, D., Rounsevell, M., Samuelsson, P., Somot, S., Soussana, J.F., Teichmann, C., Valentini, R., Vautard, R., Weber, B. & Yiou, P. (2014). EURO-CORDEX: new high-resolution climate change projections for European impact research. *Regional Environmental Change*, 14(2), 563-578.
- De Moel, H., Bouwer, L.M. & Aerts, J.C.J.H. (2014). Uncertainty and sensitivity of flood risk calculations for a dike ring in the south of the Netherlands. *Science of the Total Environment*, 473-474 (1), 224-234.
- Lung, T., Dosio, A., Becker, W., Lavallo, C. & Bouwer, L.M. (2013). Assessing the influence of climate model uncertainty on EU-wide climate change impact indicators. *Climatic Change*, 120(1-2), 211-227.
- Bouwer, L.M. (2013). Projections of future extreme weather losses under changes in climate and exposure. *Risk Analysis*, 33(5), 915-930.
- Lung, T., Lavallo, C., Hiederer, R., Dosio, A., Bouwer L.M. (2013). A multi-hazard regional level impact assessment for Europe combining indicators of climatic and non-climatic change. *Global Environmental Change*, 23(2), 522-536.
- Meyer, V., Becker, N., Markantonis, V., Schwarze, R., Van den Bergh, J.C.J.M., Bouwer, L.M., Bubeck, P., Ciavola, P., Genovese, E., Green, C., Hallegatte, S., Kreibich, H., Lequeux, Q., Logar, I., Papyrakis, E., Pfurtscheller, C., Poussin J., Przyluski, V., Thielen, A.H. & Viavattene, C. (2013). Assessing the costs of natural hazards: state-of-the-art and knowledge gaps. *Natural Hazards and Earth System Sciences*, 13(5), 1351-1373.
- Bouma, J.A., Biggs, T.W. & Bouwer, L.M. (2011). The downstream externalities of harvesting rainwater in semi-arid watersheds: an Indian case study. *Agricultural Water Management*, 98(7), 1162-1170.
- Bouwer, L.M. (2011). Have disaster losses increased due to anthropogenic climate change? *Bulletin of the American Meteorological Society*, 92(1), 39-46.
- Bouwer, L.M. & Botzen, W.J.W. (2011). How sensitive are US hurricane damages to climate? Comment on a paper by W.D. Nordhaus. *Climate Change Economics*, 1(2), 1-7.
- Bubeck, P., De Moel, H., Bouwer, L.M., & Aerts, J.C.J.H. (2011). How reliable are projections of future flood damage? *Natural Hazards and Earth System Sciences*, 11(12), 3293-3306.
- Bouwer, L.M., Bubeck, P. & Aerts, J.C.J.H. (2010). Changes in future flood risk due to climate and development in a Dutch polder area. *Global Environmental Change*, 20(3), 463-471.
- Botzen, W.J.W., Bouwer, L.M. & Van den Bergh, J.C.J.M. (2010). Climate change and hailstorm damage: empirical evidence and implications for agriculture and insurance. *Resource and Energy Economics*, 32(3), 341-362.

- Botzen, W.J.W., Van den Bergh, J.C.J.M. & Bouwer, L.M. (2010). Climate change and increased risk for the insurance sector: a global perspective and an assessment for the Netherlands. *Natural Hazards*, 52(3), 577-598.
- Martens, P., Aerts, J.C.J.H., Amelung, B., Bouwer, L.M., Chang, C.T., Huynen, M., Van Ierland, E.C., Van Koppen, C.S.A., McEvoy, D., Mol., A.P.J., & Van Tatenhove, J. (2010). Imagining the unimaginable: synthesis of essays on abrupt and extreme climate change. *Current Opinion in Environmental Sustainability*, 2(5-6), 347-355.
- Ward, P.J., Beets, W., Bouwer, L.M., Aerts, J.C.J.H. & Renssen, H. (2010). Sensitivity of river discharge to ENSO. *Geophysical Research Letters*, 37(12), L12402.
- Bouwer, L.M., Bubeck, P., Wagtenonk, A.J. & Aerts, J.C.J.H. (2009). Inundation scenarios for flood damage evaluation in polder areas. *Natural Hazards and Earth System Sciences*, 9(6), 1995-2007.
- Vermaat, J.E., & Bouwer, L.M. (2009). Less ice on the Baltic reduces the extent of hypoxic bottom waters and sedimentary phosphorus release. *Estuarine, Coastal and Shelf Science*, 82(4), 689-691.
- Maaskant, B., Jonkman, S.N., & Bouwer, L.M. (2009). Future risk of flooding: an analysis of changes in potential loss of life in South Holland (The Netherlands). *Environmental Science & Policy*, 12(2), 157-169.
- Bouwer, L.M., Vermaat, J.E. & Aerts, J.C.J.H. (2008). Regional sensitivities of mean and peak river discharge to climate variability in Europe. *Journal of Geophysical Research-Atmospheres*, 113, D19103.
- Bouwer, L.M., Biggs, T.W. & Aerts, J.C.J.H. (2008). Estimates of spatial variation in evaporation using satellite-derived surface temperature and a water balance model. *Hydrological Processes*, 22(5), 670-682.
- Olsthoorn, X., Van der Werff, P., Bouwer, L.M. & Huitema, D. (2008). Neo-Atlantis: The Netherlands under a five-metre sea level rise. *Climatic Change*, 91(1-2), 103-122.
- Bouwer, L.M., Crompton, R.P., Faust, E., Höpfe, P. & Pielke, Jr., R.A. (2007). Confronting disaster losses. *Science*, 318, 753.
- Warner, K., Bouwer, L.M. & Ammann, W. (2007). Financial services and disaster risk finance: examples from the community level. *Environmental Hazards*, 7(1), 32-39.
- Aerts, J.C.J.H., Renssen, H., Ward, P.J., de Moel, H., Odada, E., Bouwer, L.M. & Goosse, H. (2006). Sensitivity of global river discharges under Holocene and future climate conditions. *Geophysical Research Letters*, 33(19), L19401.
- Bouwer, L.M., Aerts, J.C.J.H., Droogers, P. & Dolman, A.J. (2006). Detecting the long-term impacts from climate variability and increasing water consumption on runoff in the Krishna river basin (India). *Hydrology and Earth System Sciences*, 10(5), 703-713.
- Bouwer, L.M., Vermaat, J.E. & Aerts, J.C.J.H. (2006). Winter atmospheric circulation and river discharge in northwest Europe. *Geophysical Research Letters*, 33(6), L06403.
- Bouwer, L.M. & Aerts, J.C.J.H. (2006). Financing climate change adaptation. *Disasters*, 30(1), 49-63.
- Bouwer, L.M. & Vellinga, P. (2005). Some rationales for risk sharing and financing adaptation. *Water Science and Technology*, 51(5), 89-95.
- Hoff, H., Warner, K. & Bouwer, L.M. (2005). The role of financial services in climate adaptation in developing countries. *Vierteljahrshefte zur Wirtschaftsforschung*, 74(2), 196-207.

- Houtgast, R.F., Van Balen, R.T., Bouwer, L.M., Brand, G.B.M. & Brijker, J.M. (2002). Late Quaternary activity of the Feldbiss Fault Zone, Roer Valley Rift System, the Netherlands, based on displaced fluvial terrace fragments. *Tectonophysics*, 352(3-4) 295-315.
- Prins, M.A., Bouwer, L.M., Beets, C.J., Troelstra, S.R., Weltje, G.J., Kruk, R.W., Kuijpers, A. & Vroon, P.Z. (2002). Ocean circulation and iceberg discharge in the glacial North Atlantic: inferences from unmixing of sediment size distributions. *Geology*, 30(6) 555-558.

Other journal contributions

- Bouma, J.A., Biggs, T.W. & Bouwer, L.M. (2014). Comment on Garg et al (2012) Up-scaling potential impacts on water flows from agricultural water interventions: opportunities and trade-offs in the Osman Sagar catchment, Musi sub-basin, India. *Hydrological Processes*, 28(8), 3350-3351.
- Zethof, M., Kolen, B. & Bouwer, L.M. (2014). Meerlaagsveiligheid: integratie water en ruimte. *Land en Water*, No. 3, 34-36.
- Kolen, B., Jonkman, B. & Bouwer, L.M. (2012). Anderhalf jaar na de Tohoku tsunami in Japan: leren van de zoektocht naar een acceptabel risico voor een nieuw waterveiligheidsbeleid tijdens de wederopbouw. *Water Governance*, 04/2012, 42-46.
- Bouwer, L.M. (2011). Reply to comments on "Have disaster losses increased due to anthropogenic climate change?". *Bulletin of the American Meteorological Society*, 92(6), 792-793.
- Aerts, J.C.J.H., Botzen, W.J.W. & Bouwer, L.M. (2008). Rol verzekering binnen geïntegreerde aanpak van overstromingsrisico's. *Magazine Nationale Veiligheid en Crisisbeheersing*, Jaargang 1, Nummer 9, 34-35. (in Dutch)
- Bouwer, L.M., Botzen, W.J.W. & Aerts, J.C.J.H. (2007). Klimaatverandering en verzekeren van rampschade. *H2O, Tijdschrift voor Watervoorziening en Waterbeheer*, Nummer 22, 23-25. (in Dutch)
- Bouwer, L.M. & Aerts, J.C.J.H. (2006). How can we maximize the impact of adaptation measures to support sustainable development? *Natural Resources Forum*, 30(4), 328-329.
- Pielke, Jr., R.A., Agrawala, S., Bouwer, L.M., Burton, I., Changnon, S., Glantz, M.H., Hooke, W.H., Klein, R.J.T., Kunkel, K., Mileti, D., Sarewitz, D., Tompkins, E.L., Stehr, N. & Von Storch, H. (2005). Clarifying the attribution of recent disaster losses: a response to Epstein and McCarthy. *Bulletin of the American Meteorological Society*, 86(10), 1481-1483.

Editor journal special issues

- Kreibich, H., Bouwer, L.M., Schwarze, R. & Guzetti, F. (eds.). *Natural Hazards and Earth System Sciences*, Special Issue: Costs of Natural Hazards (2014).
- Berkhout, F. & Bouwer, L.M. (eds.). *Regional Environmental Change*, Special Issue: RESPONSES Project (2015).

Edited books

- Mechler, R., Bouwer, L.M., Schinko, T., Surminski, S. & Linnerooth-Bayer, J. (eds.) (2018). *Loss and Damage from Climate Change: Concepts, Principles and Policy Options*. Springer.
- Allaert, G., Bouwer, L.M., De Sutter, R., Gulinck, H., Meire, P., Van Damme, S., Van den Broeck, P., Van Eetvelde, V. (eds.) (2012). *Klimaat in Vlaanderen als Ruimtelijke Opgave*. Academia Press, Gent.
- Vermaat, J.E., Bouwer, L.M., Turner, R.K. & Salomons, W. (eds.) (2005). *Managing European Coasts: Past Present and Future*. Springer, Berlin, 387 pp.

Peer-reviewed book chapters

- Kovats, S., Valentini, R., Bouwer, L.M., Georgopoulou, E., Jacob, D., Martin, E., Rounsevell, M., Soussana, J.F. (2014). Europe. Chapter 23 in: Field, C.B. et al. (eds.). *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 1267-1326.
- Cramer, W., Yohe, G., Auffhammer, M., Huggel, C., Molau, U., Da Silva Dias, M.A.F., Solow, A., Stone, D., Tibig, L., Bouwer, L.M., Carey, M., Cogley, G., Coumou, D., Estrada, Y.O., Faust, E., Hansen, G., Hoegh-Guldberg, O., House, J., Hsiang, S., Hughes, L., Kovats, S., Leadley, P., Lobell, D., Parmesan, C., Poloczanska, E., Pörtner, H.O. & Reisinger, A. (2014). Detection and attribution of observed impacts. Chapter 18 in: Field, C.B. et al. (eds.). *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 979-1037.
- Handmer, J., Y. Honda, Z.W. Kundzewicz, N. Arnell, G. Benito, J. Hatfield, I.F. Mohamed, P. Peduzzi, S. Wu, B. Sherstyukov, K. Takahashi, Z. Yan, A. Abdulla, L.M. Bouwer, J. Campbell, M. Hashizume, F. Hattermann, R. Heilmayr, A. Keating, M. Ladds, K.J. Mach, M.D. Mastrandrea, R. Mechler, C. Nobre, A. Sanghi, J. Screen, J. Smith, A. Velegrakis, W. Vergara, A.M. Waite, J. Westrich, J. Whittaker, Y. Yunhe & H. Yamano (2012). Changes in impacts of climate extremes: human systems and ecosystems. Chapter 4 in: Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.K. Plattner, S.K. Allen, M. Tignor, & P.M. Midgley (eds.). *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 231-290.
- Bouwer, L.M., De Moel, H. & Aerts, J.C.J.H. (2008). The potential impacts of climate change on freshwater availability in the Krishna river delta (India). Chapter 33 in: Krishnamurthy, R.R., et al. (eds.). *Integrated Coastal Zone Management: The Global Challenge*. Research Publishing Services, Singapore, 625-640.
- Bouwer, L.M. & Vellinga, P. (2007). On the flood risk in The Netherlands. Chapter 24 in: Begum, S., Stive, M.J.F. & Hall, J.W. (eds.). *Flood Risk Management in Europe: Innovation in Policy and Practice*. Springer, Berlin, 469-484.
- Bouwer, L.M. & Vellinga, P. (2002). Changing climate and increasing costs: implications for liability and insurance. In: Beniston, M. (ed.). *Climatic Change: Implications for the Hydrological Cycle and for Water Management*. Kluwer, Dordrecht, 429-444.
- Vellinga, P., Mills, E., Berz, G., Bouwer, L.M., Huq, S., Kozak, L.A., Palutikof, J., Schanzenbacher, B. & Soler, G. (2001). Insurance and other financial services. Chapter 8 in: McCarthy, J.J., O.F. Canziani, N.A. Leary, D.J. Dokken, and K.S. White (eds.) *Climate Change 2001: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press, Cambridge, 417-450.

Other book chapters

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