

Hans Bihs

Professor, PhD

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Employment

- since 12/2020 **Professor** at the research group Marine Civil Engineering, Department of Civil and Environmental Engineering, NTNU Trondheim, Norway
- 12/2015 - 12/2020 **Associate Professor** at the research group Marine Civil Engineering, Department of Civil and Environmental Engineering, NTNU Trondheim, Norway
- 08/2012 - 12/2015 **Post-Doc** at the research group Marine Civil Engineering, Department of Civil and Transport Engineering, NTNU Trondheim, NTNU Trondheim, Norway
- 08/2011 - 07/2012 **Adjunct Associate Professor** at the research group Marine Civil Engineering, Department of Civil and Transport Engineering, NTNU Trondheim, Norway
- 09/2010 - 07/2012 **Research Scientist** at the Coast and Harbour Research Laboratory, SINTEF, Trondheim, Norway
- 10/1996 - 07/2006 **Working constructions** (a total of 54 weeks); open trench sewer pipe constructions, manned pipe jacking and industrial constructions with Friedrich Rempke GmbH & Co.KG in Hagen, Germany

Education

- 08/2006 - 09/2010 **PhD-Student** at the Department of Hydraulic and Environmental Engineering, NTNU Trondheim; Thesis title: Three-Dimensional Numerical Modeling of Local Scouring in Open Channel Flow"; (*Defense: May 2011*)
- 10/2001 - 03/2006 **Civil Engineering** (M.Sc.) at the TU Braunschweig, Germany, specialization in hydraulic engineering, water and waste water treatment and construction management
- 07/2000 - 04/2001 **Military service** with the Heeresmusikkorps 2 (Military Band) in Kassel, Germany
- 08/1997 - 07/1998 **Exchange student** in Roxbury, New York; scholarship of the German Bundestag and the Congress of the United States of America

09/1991 - 06/2000 **Hildegardis-School** of the Augustin Convent in Hagen, Germany

08/1987 - 07/1991 **Henry-van-de-Velde Primary School** in Hagen, Germany

Skills

Expertise	CFD (Computational Fluid Dynamics) Numerical Methods, Programming, High Performance Computing Wave Hydrodynamics, Wave Modeling Wave-Structure Interaction, Floating Structures Fluid Mechanics, Turbulence, Open Channel Flow Sediment Transport, Local Scour, Coastal Dynamics Multiphase Flow, Stratified Flow, Granular Flow
Programming	C++ Fortran, MPI
Software	REEF3D, ParaView, SSIIM, STAR-CCM+ Latex, AutoCAD, Tecplot, Mac OS, Linux, Windows
Languages	German (native speaker) English (fluent) Norwegian (fluent)

Software Development

- since 2008 **REEF3D**, an Open-Source three-dimensional CFD program for the numerical calculation of complex free surface flows with the level set method.
www.reef3d.com
- since 2008 **DIVEMesh**, an Open-Source mesh generation software for the open-source CFD code REEF3D
www.reef3d.com/source-code/
- 2006 -2010 **Gridmeister**, a free program for the automated generation of structured and curvilinear grids for SSIIM.
<http://sourceforge.net/projects/gridmeister/>
- 2006 - 2010 **SSIIM**, an established computational fluid dynamics (CFD) program to model water flow and sediment transport in rivers and lakes. Extending the model through programming several plugins.
<http://folk.ntnu.no/nilsol/cfd/>

Research Grants

B-WAVES: Bottom Fixed Offshore Wind Turbines in Extreme Waves (2024-2027)

One PhD Student at NTNU Trondheim.

Researchers at SINTEF Ocean

National cooperation with SINTEF Ocean and the Norwegian Meteorological Institute

Industry Partners: Equinor, DNV, Aker Solutions and COWI

Funded by the Research Council of Norway, KPN Project.

Budget: 17.0 million NOK (ca. 1,700,000 €)

Role: Proposal, main supervisor the PhD Student.

Improved parameterisation of NNBF in 2DH coastal area models to better inform coastal hazard prediction (2023-2024)

International cooperation with JBA Consulting, United Kingdom, under contract of the US Army Corps of Engineers

Budget: ca. 195.000 NOK (ca. 19,500 \$)

Role: Technial Advisor.

Coastal Wave Modelling in the World Surfing Reserve of Ericeira (2023-2024)

One Post-Doc at NTNU Trondheim.

International cooperation with BlueOASIS, Ericeira, Portugal

Funded by the Portugal-Norway EEA grants

Budget: ca. 150.000 NOK (ca. 15,000 €)

Role: Proposal, Project Collaborator.

PARTRES: Particle Resolving Fluid-Sediment Interaction (2023-2027)

Five PhD-students at NTNU Trondheim.

Three Post-Docs at NTNU Trondheim.

Funded by ERC Consolidator Grant

Budget: 29 million NOK (ca. 2,9 €), from EU: 20 million NOK (ca. 2,0 €)

Role: Proposal, Project Manager, PhD-student and Post-Doc main supervisor.

MAPLE: Marine Plastic Pollution: Environmental impact and life cycle scenarios (2022-2026)

Four PhD-students at NTNU Trondheim.

Funded by NTNU

Budget: 2.5 million NOK (ca. 250,000 €)

Role: Proposal, Work package leader, PhD-student supervisor.

DIGICOAST: Next-Generation Coastal Modeling for Wave, Current and Sediment Transport Impact on Coastal Infrastructure,
(2021-2024)

One PhD-student at NTNU Trondheim.
Funded by the Department of Civil and Environmental Engineering
Budget: 2.5 million NOK (ca. 250,000 €)
Role: Proposal, Project Manager, PhD-student main supervisor.

NumSiSSI: Development of numerical methods for modelling ship-generated waves and their interaction with embankments,
(2020-2024)

Joint research project with the TU Braunschweig, Germany and the Federal Waterways Engineering Research Institute (BAW), Germany
Budget: 0.5 million NOK (ca. 50,000 €)
Role: Project Collaborator.

IPIRIS: Improving Ship Performance in Real Sea States,
(2020-2024)

Two PhD Students at NTNU Trondheim.
Researchers at SINTEF Ocean
National cooperation with SINTEF Ocean
Industry Partners: Kongsberg Maritime, Havyard, Vard Design
Funded by the Research Council of Norway, KPN Project.
Budget: 15.0 million NOK (ca. 1,500,000 €)
Role: Proposal, main supervisor of the 2 PhD Students.

SolidShore: Solutions to Current and Future Problems on Natural and Constructed Shorelines, Eastern Baltic Sea,
(2020-2024)

One Post-Doc at NTNU Trondheim.
International cooperation with the Tallinn University of Technology, Estonia; Klaipeda University, Lithuania; Latvian Institute of Aquatic Ecology
Funded by the Estonia-Norway EEA grants
Budget: ca. 9.0 million NOK (ca. 900,000 €)
Role: Proposal, Post-Doc main supervisor.

High-Resolution Slope Stability Analysis with Integrated Hydrodynamic Modelling,
(2019-2021)

One Post-Doc at NTNU Trondheim.
Funded by the IV Faculty
Budget: 1.5 million NOK (ca. 155,000 €)
Role: Proposal, Project Manager, Post-Doc main supervisor.

**High-Resolution Numerical Modelling of Flexible Fish Cage Structures,
(2017-2021)**

One PhD Student and one Post-Doc at the NTNU Trondheim.

Researchers at SINTEF Ocean

National cooperation with SINTEF Ocean

International cooperation with the IIT Bombay, India and University Hannover, Germany

Funded by the Research Council of Norway, Havbruk2 Toppforsk Project.

Budget: 11.9 million NOK (ca. 1,229,000 €)

Role: Proposal, Project Manager, PhD and Post-Doc main supervisor.

**An Integrated Numerical Modeling Approach for the Accurate Calculation of Wave Propagation
(2016-2019)**

One PhD Student at NTNU Trondheim.

Funded by Statens Vegvesen/E39.

Budget: 3.79 million NOK (ca. 392,000 €)

Role: Proposal, PhD main supervisor.

**Hydrodynamic Loads on Offshore Wind Turbine Substructures due to Nonlinear Irregular
Breaking, High Steep and Extreme Waves,
(2015-2018)**

National cooperation with SINTEF Ocean

International cooperation with the Department of Ocean Engineering at IIT Madras, India; one PhD student and one Post-Doc at NTNU Trondheim, two PhD students at the IIT Madras.

Funded by the Research Council of Norway, INDNOR program.

Budget: 5.0 million NOK (ca. 517,000 €)

Role: Proposal, PhD main supervisor and Post-Doc co-supervisor.

**3DFLOAT - Floating Structures
(2015-2017)**

One Post-Doc at NTNU Trondheim.

Funded by the IVT Faculty, Statens Vegvesen/E39 and internal funding.

Budget: 1.5 million NOK (ca. 155,000 €)

Role: Proposal, Post-Doc co-supervisor.

**Vulnerability to the Arctic Coast due to Climate Change
(2014-2018)**

International cooperation with the Institute of Hydroengineering at the Polish Academy of Science, Gdansk, Poland; one PhD student at NTNU Trondheim, several researchers at the Institute of Hydroengineering.

Funded by the Norwegian-Polish Research Program.

Budget: 8.87 million NOK (ca. 916,000 €)

Role: Proposal, researcher, PhD co-supervisor.

OWC Wave Energy Converters for Combined Clean Energy and Coastal Protection (2012-2015)

National cooperation with SINTEF Ocean

International cooperation with the Department of Ocean Engineering at IIT Madras, India; one PhD student at NTNU Trondheim, one PhD student at the IIT Madras.

Funded by the Research Council of Norway, INDNOR program.

Budget: 5.7 million NOK (ca. 589,000 €)

Role: Proposal, researcher, PhD co-supervisor

Other Research Project Participations

HAWA-III JIP - Shallow Water Initiative (2022-2024)

Joint Industry Project, headed by MARIN.

Role: Verifier.

Reproducible Computational Fluid Dynamics (CFD) Modeling Practices for Offshore Applications (2019-2022)

Joint Industry Project, headed by TechnipFMC.

Role: Project Collaborator.

Environmental Innocuous Pile Head Breakwater for the Mitigation of Coastal Erosion (since 2019)

Funded by Scheme for Promotion of Academic and Research Collaboration (SPARC), India.

Collaboration with Dr. Pruthviraj Umesh; National Institute of Technology Surathkal, India.

Role: Project Collaborator.

World of Wild Waters (WoWW) - Gamification of Natural Hazards (since 2019)

Funded by NTNU Trondheim, NTNU Digital Transformation project.

Role: PhD co-supervisor.

Landslides triggered by hydro-meteorological processes - Klima2050 (since 2016)

Funded by the Research Council of Norway, SFI project.

Role: PhD co-supervisor.

Wave forces on offshore wind turbine substructures, WP3: Novel support structures & floater, NOWITECH (2011-2015)

Funded by the Research Council of Norway, FME project.

Role: PhD co-supervisor.

Tsunami wave generation in hydropower reservoirs due to rockslides. (2011-2012)

Funded by NVE.

Role: Project Leader for SINTEF Coast and Harbour Laboratory

Laboratory experiments and numerical modelling of tsunamis generated by rock slides into fjords.

(2011-2012)

University of Oslo, funded by the Research Council of Norway, FRINATEK program.

Role: Project Leader for SINTEF Coast and Harbour Laboratory

Sustainable Arctic Marine and Coastal Technology, SAMCoT, WP6: Coastal Technology.

(2011-2012)

Funded by the Research Council of Norway, SFI project.

Role: Researcher for SINTEF Coast and Harbour Laboratory

Numerical Modeling of Erosion Damages during Floods

(2006-2010)

Funded by the Research Council of Norway, FRINATEK program.

Role: PhD student

Student Supervision

Post-Docs and Researchers

Tobias Martin (2021-2022), *Numerical Modeling of Ship Hydrodynamics in Real Sea Conditions*, Supervisor.

Weizhi Wang (2019-2022), *High-resolution slope stability analysis with integrated hydrodynamic modelling*, Supervisor.

Csaba Pakozdi (2019), *Wave Modeling with Fully-Nonlinear Potential Flow Solvers*, sabbatical (80%) from SINTEF Ocean, Supervisor.

Arun Mulky Kamath (2015-2021), *Numerical Modeling of Waves Propagation, Wave Hydrodynamics and Wave-Structure Interaction with REEF3D*, Supervisor.

Mayilvahanan Alagan Chella (2015-2017), *Numerical Modeling of Extreme and Breaking Wave Forces on Offshore Wind Substructures*, Supervisor.

PhD Students

Alexander Hanke (since 10/2023), *Particle resolving modeling of sediment transport*, Supervisor.

Fabian Knoblauch (since 09/2022), *Numerical Modeling of Ship Hydrodynamics in Real Sea Conditions*, Supervisor.

Ahmed Marhoon (since 08/2022), *Origin and Impact of Plastic Products*, Co-Supervisor.

Ahmet Soydan (since 07/2021), *Numerical Modeling of Ship Hydrodynamics in Real Sea Conditions*, Supervisor.

Ronja Ehlers (since 06/2021), *Coastal Modeling for Wave, Current and Sediment Transport Impact on Coastal Infrastructure*, Supervisor.

Elyas Larkermanni (since 2019), *Numerical Modelling of Air Flow and Heat Transfer in Buildings with REEF3D*, Co-Supervisor.

Gebray Habtu Alene (since 2019), *Modelling and Visualization of Runout of Flow Landslides within World of Wild Water - Gamification of Natural Hazards*, Co-Supervisor.

Michal Pavlicek (2019-2021), *Hydrodynamic and hydromorphological simulation of floods in steep waterways*, Co-Supervisor.

Tobias Martin (2017-2021), *High-resolution numerical modelling of floating flexible fish cages with REEF3D*, successfully defended, Supervisor.

Weizhi Wang (2016-2019), *An Integrated Numerical Modeling Approach for the Accurate Calculation of Wave Propagation with REEF3D*, successfully defended, Supervisor.

Petter Fornes (since 2016), *Landslides Triggered by Hydro-Meteorological Processes: Debris Flow Modeling with REEF3D*, Co-Supervisor.

Ankit Aggarwal (2015-2018), *Numerical Modelling of Irregular waves and Wave Forces on Offshore Wind Substructures*, successfully defended, Supervisor.

Nadeem Ahmad (2014-2018), *Numerical Modeling of Sediment Transport under Arctic Conditions*, successfully defended, Co-Supervisor.

Arun Mulky Kamath (2012-2015), *CFD based Investigation of Wave-Structure Interaction and Hydrodynamics of an Oscillating Water Column Device*, successfully defended, Co-Supervisor.

Mayilvahanan Alagan Chella (2010-2015), *Numerical Modeling of Breaking Wave Forces*, successfully defended, Co-Supervisor.

Visiting Researchers

Gang Wang (09/2019 - 10/2021), PhD Student, Fishery College, Ocean University of China, funded by China Scholarship Council (CSC), *PANS Simulation Methods and Fluid-Structure interaction applied in the fishing facilities*, Hosting Supervisor.

Ting Cui (09/2019 - 12/2020), PhD Student, College of Shipbuilding Engineering, Harbin Engineering University, China, funded by China Scholarship Council (CSC), *Modeling internal solitary waves and the interaction of the structure*, Hosting Supervisor.

Feng Xing (01/2020 - 02/2021), Assistant Professor, Marine Engineering College, Dalian Maritime University, China, funded by China Scholarship Council (CSC), *Numerical Modeling of Ship Seakeeping with REEF3D*, Hosting Supervisor.

Arun Kumar (08/2019 - 11/2019), PhD Student, Department of Ocean Engineering, NITK Surathkal, India, funded by SPARC *Environmental Innocuous Pile Head Breakwater for the Mitigation of Coastal Erosion*, Hosting Supervisor.

Lilei Mao (10/2018 - 10/2019), PhD Student, School of Transportation, Southeast University Nanjing, China, funded by China Scholarship Council (CSC), *Numerical Modeling of Sediment Movement Induced by Passing Ships in Inland-restricted Waterway with REEF3D*, Hosting Supervisor.

Vijaya Kumar Govindasamy (06/2018 - 06/2018), PhD Student, Department of Ocean Engineering, IIT Madras, India, *Working on focused breaking wave impact on offshore wind substructures with REEF3D*, Hosting Supervisor.

Rameeza Moireen (01/2016 - 02/2016), PhD Student, Department of Civil Engineering, IIT Bombay, India, *Working on extreme and focused wave impact on offshore structures with REEF3D*, Hosting Supervisor.

Adria Moreno Miquel (09/2015 - 02/2016), PhD Student, Department of Civil, Chemical, Environmental and Materials Engineering, University of Bologna, Italy, *Working on floating wave energy devices with REEF3D*, Hosting Supervisor.

John Ashlin (04/2015 - 06/2015), PhD Student, Department of Ocean Engineering, IIT Madras, India, *Working on oscillating water column ocean energy device hydrodynamics with REEF3D*, Hosting Co-Supervisor.

Master Students

Vilde Malmei (2023), Master thesis, *Hydrodynamic modeling of floating offshore wind turbines*, Supervisor.

Albert Bosch Rico (2023), Master thesis, ERASMUS exchange student (home university: UPC Barcelona), *Coastal wave modeling*, Supervisor.

Lars Ottar Jorde (2022), Master thesis, *Numerical investigation of flow and scour around a circular cylinder*, Supervisor.

Lorenzo Ciconte (2022), Master thesis, ERASMUS exchange student (home university: University of Florence, Italy) *Numerical modeling of coastal erosion*, Supervisor.

Ayda Mirzaahmadi (2022), Master thesis, *Numerical investigation of sediment transport in open-channel flow*, Co-Supervisor.

Adrian Filip (2021), Project thesis, *Breaking Waves on Monopiles using the REEF3D framework*, Supervisor.

Knut Reidulff (2021), Project thesis, *Wave environment assessment at a Norwegian harbor for land-based aquaculture facilities using a combined numerical approach*, Supervisor.

Ronja Ehlers (2020), Master thesis, ERASMUS exchange student (home university: Technical University of Munich, Germany), *Using a 2D Shallow Water Equations model with dynamic pressure extension to simulate open channel flow with low relative submergence*, Co-Supervisor.

Yueyuan Jin (2020), Master thesis, CoMEM ERASMUS+ student, *Overtopping of coastal structures using REEF3D*, Supervisor.

Ingebrigt Davik (2020), Master thesis, *Large-Scale Numerical Modeling of Swell Waves in Bjørnafjorden Using the Phase-Resolving Wave Model REEF3D*, Supervisor.

Brage Lysø (2020), Master thesis, *Numerical study on aquaculture structures*, Supervisor.

Carlos Dempwolff (2019), Master thesis, ERASMUS exchange student (home university: University of Hannover, Germany), *Numerical Modelling of Wave Interaction with Floating structures and Moored Floating Structures with REEF3D*, Supervisor.

Daniil Popov (2019), Master thesis, CoMEM ERASMUS+ student, *Numerical Modeling Submerged Tunnel Hydrodynamics with REEF3D*, Supervisor.

Khaled Damdam (2019), Master thesis, CoMEM ERASMUS+ student, *Combined Submerged and Floating Breakwater Wave Attenuation Modeling with REEF3D*, Supervisor.

Lim, Sung-Soo (2019), Master thesis, CoMEM ERASMUS+ student, *Coupled Fluid-Structure Interaction Simulations of Deformable Aquaculture Structures with REEF3D*, Supervisor.

Niccolo Nuti (2018), Master thesis, ERASMUS exchange student (home university: University of Florence, Italy), *Numerical Modeling of Extreme Flooding of the River Arno with REEF3D*, Supervisor.

Alonso Madrigal (2018), Master thesis, ERASMUS exchange student (home university: University of Algarve, Portugal), *Large Scale Wave Modeling for Aquaculture Site Identification with REEF3D*, Supervisor.

Lluís Fernandez Maza (2018), Master thesis, ERASMUS exchange student (home university: UPC Barcelona, Spain), *Calculation of Wave Forces due to extreme events in the coastal region using REEF3D*, Supervisor.

Mohamed Elakel (2018), Master thesis, CoMEM ERASMUS+ student, *Investigation of Wave Transformation and Breaking Processes in the Coastal Zone using REEF3D*, Supervisor.

Seimur Shirinov (2018), Master thesis, ERASMUS exchange student (home university: University of Bologna, Italy), *Calculation of Wave Forces on Offshore Wind Turbine Jacket Sub-structures using REEF3D*, Supervisor.

Mammadov Tural (2018), Master thesis, ERASMUS exchange student (home university: University of Bologna, Italy), *Numerical Modelling of Wave Interaction with Floating structures and Moored Floating Structures with REEF3D*, Supervisor.

Jiayi Zheng Lu (2017), Master thesis, ERASMUS exchange student (home university: University of Valencia, Spain), *Modeling of Moored Floating Structures under Wave Conditions with REEF3D*, Supervisor.

Gabor Fleit (2016), Master thesis, ERASMUS exchange student (home university: University of Budapest, Hungary), *Numerical Modeling of Sediment Transport under Complex Free Surface Flows with REEF3D*, Co-Supervisor.

Athul Sasikumar (2016), Master thesis, CoMEM ERASMUS+ student, *Numerical Modelling of Wave Hydrodynamics and Wave Interaction with Porous Breakwaters using REEF3D*, Supervisor.

Amarachaharam Thevaheer (2016), Master thesis, CoMEM ERASMUS+ student, *Numerical Modelling of Focused Waves and Focused Wave Forces with REEF3D*, Supervisor.

Ankit Aggarwal (2015), Master thesis, CoMEM ERASMUS+ student, *Numerical Modelling of Irregular Waves and Irregular Wave Forces with REEF3D*, Co-Supervisor.

Mohammad Saud Afzal (2013), Master thesis, CoMEM ERASMUS+ student, *3D Numerical Modelling of Sediment Transport under Currents and Waves*, Co-Supervisor

Arun Mulky Kamath (2012), Master thesis, CoMEM ERASMUS+ student, *Waves Forces on Structures Using REEF3D*, Supervisor.

Muhammad Tedy Asyikin (2012), Master thesis, CoastMAR student, *CFD Simulation of Vortex Induced Vibrations of a Cylindrical Structure*, Supervisor.

Bachelor Students

Lars Ottar Jorde (2021), Project thesis, *Numerical investigation of flow and scour around a circular cylinder*, Supervisor.

Knut Reidulff (2020), Project thesis, *Phase-resolved Wave Modeling of Skarberget Ferry Terminal with REEF3D::FNPF*, Supervisor.

Ashlesh S Sharma (2020), Project thesis, *CFD of Aquaculture Cages Using REEF3D*, Co-Supervisor.

Markus Witt (2019), Project thesis, ERASMUS internship (home university: Technical University Dresden, Germany), *Non-Hydrostatic Depth-Averaged Modeling of Sediment Transport under Wave Conditions*, Supervisor.

Ingebrigt Davik (2019), Project thesis, *Numerical study on wave propagation in Norwegian fjords for the E39 project*, Supervisor.

Brage Lysø (2019), Project thesis, *Numerical study on aquaculture nets*, Supervisor.

Yueyuan Jin (2019), Internship report, CoMEM ERASMUS+ student, *Benchmark Testing of REEF3D::FNPF*, Supervisor.

Bärbel Herges (2017), Project thesis, ERASMUS exchange student (home university: University of Applied Science Karlsruhe, Germany), *Modeling of Sediment Transport with REEF3D*, Supervisor.

Lluís Fernandez Maza (2017), Project thesis, ERASMUS exchange student (home university: UPC Barcelona, Spain), *Benchmarking REEF3D's Numerical Wave Tank*, Supervisor.

Thibaut Lucari (2017), Internship report, ERASMUS internship (home university: ENTPE Lyon, France), *Adaptability of SWASH for a Norwegian Coastal Case*, Supervisor.

Javier Sanchez Tundidor (2017), Project thesis, ERASMUS exchange student (home university: UPC Barcelona, Spain), *Rockslide Generated Impulse Waves with REEF3D*, Supervisor.

Kristina Heveling (2017), Project thesis, ERASMUS exchange student (home university: Karlsruhe Institute of Technology, Germany), *Modeling Wave Conditions at Andenes Harbor with REEF3D*, Supervisor.

Maximilian Völlinger (2017), Project thesis, ERASMUS exchange student (home university: University of Hannover, Germany), *Vertical Wave Forces on Offshore Structures with REEF3D*, Supervisor.

Jiayi Zheng Lu (2016), Project thesis, ERASMUS exchange student (home university: University of Valencia, Spain), *Modeling of Large Floating Structures under Wave Conditions with REEF3D*, Supervisor.

Tanguy Paquereau-Gaboreau (2016), Summer project/Internship report, ERASMUS internship (home university: Grenoble University, France) *Numerical simulation of three-dimensional stratified flows on smooth and rough bottom using an innovative CFD software: REEF3D*, Supervisor.

Alvaro Garcia Torres (2016), Bachelor thesis, ERASMUS exchange student (home university: UPC Barcelona, Spain), *Numerical Modelling of Run-up and Overtopping with REEF3D*, Supervisor.

Gabor Fleit (2015), Bachelor thesis, ERASMUS exchange student (home university: University of Budapest, Hungary), *Numerical Modeling of Open Channel Flow with REEF3D*, Co-Supervisor.

Ankit Aggarwal (2014), Project thesis, Master thesis, CoMEM ERASMUS+ student, *Numerical Modeling of Wave Propagation and Wave Forces with REEF3D*, Co-Supervisor.

Mohammad Saud Afzal (2012), Project thesis, Master thesis, CoMEM ERASMUS+ student, *Wave propagation over a rugged topography Mehamn harbor Norway using SWAN model*, Co-Supervisor.

Pedagogical Training

- 2020 **Pedagogical Portfolio** module for development of a pedagogical portfolio for higher-education teachers at NTNU Trondheim, 20 hour course.
- 2016-2017 **PEDUP** pedagogical program for professors at NTNU Trondheim, 100 hour course.
- 2016 **PhD Supervisor Seminar** held by the Faculty of Engineering, Science and Technology, NTNU Trondheim.

Teaching

- since 2021 **Hydromechanics** (TVM4116, BSc-course, [NTNU Trondheim](#)),
Role: teaching hydrostatics, drag, lift, wave kinematics, and wave forces lectures (50%)
- since 2018 **Advanced Numerical Modeling of Marine Free Surface Flows** (BA8404, PhD-course, [NTNU Trondheim](#))
Role: Teaching about numerical and programming aspects for modeling of wave hydrodynamics based on REEF3D open-source software (100%), started and designed a new course from scratch, formally responsible for the course
- 2016 - 2019 **Arctic Infrastructures in a Changing Climate** (AT-301, MSc-course, guest lecturer [UNIS Svalbard](#)) Role: teaching wave modeling and sediment transport in coastal areas lectures (6 hrs every year)
- 2015 - 2018 **Arctic Marine Civil Engineering** (TBA4265, Masterkurs, [NTNU Trondheim](#)),
Role: teaching numerical modeling of waves and the physics of wave forces (ca. 14 %)
- 2014 - 2018 **Advanced Topics in Port and Coastal Engineering** (BA8403, PhD-course, [NTNU Trondheim](#)),
Role: teaching about numerical and programming aspects of CFD for wave propagation (ca. 80%)
- since 2013 **Coastal Engineering** (TBA4270, MSc-course, [NTNU Trondheim](#)), teaching wave modeling and sediment transport
Role: Teaching wave modeling, loads and sediment transport (100 %), transforming the course content away from analytical approaches towards state-of-the-art wave, flow and sediment transport modeling, formally responsible for the course since 2017

- 2011 - 2015 **Port and Coastal Facilities** (TBA4145, MSc-course, [NTNU Trondheim](#))
Role: teaching the numerical wave modeling lecture (ca 8 %)
- 2006 - 2009 **Hydromechanics** (TVM4116, BSc-course, [NTNU Trondheim](#)), Research Assistant for Exercises and Laboratory
Role: conducting exercise hours; build-up, organization and conducting the hydraulic lab exercises
- 2006 - 2010 **Numerical Modeling and Hydraulics** (TBA4155, MSc-course, [NTNU Trondheim](#)), Research Assistant for Exercises
Role: conducting all exercise hours and correcting the homework
- 2003 - 2005 **Structural Analysis** (MSc-course, [TU Braunschweig](#)), Student Assistant
Role: hands-on exercises with the students of the first semester and correction of homework for semesters 1-3

PhD Committees

- 2022 **Member of the Doctoral Committee** for [Jesper Roland Kjægaard Qvist](#), *Investigation of finite volume methods for free surface flows with focus on the numerical description of the air-water interface*; Supervisor: Prof. Erik Damgaard Christensen, Technical University of Denmark, Department of Mechanical Engineering.
- 2020 **Examiner** for the PhD-thesis of [Vivek Francis](#), *Hydrodynamic Characteristics of Thin Porous Barriers*; Supervisors: Prof. Balaji Ramakrishnan, IIT Bombay, Department of Ocean Engineering; Prof. Murray Rudman, Monash University, Department of Mechanical and Aerospace Engineering
- 2020 **Examiner** for the PhD-thesis of [Manoj Kumar](#), *A Hybrid Numerical Model for Simulating Wave Structure Interaction*; Supervisor: Assoc. Prof. Sriram Venkatchalam, IIT Madras, Department of Ocean Engineering.
- 2019 **Member of the Doctoral Committee** for [Charalambos Frantzis](#), *Accelerating CFD Simulations of Two-Fluid Flows: Application in Numerical Wave Tanks*; Supervisor: Prof. Dimokratis Grigoriadis, University of Cyprus, Department of Mechanical Engineering.
- 2019 **Administrator** for the PhD committee of [Marnix van den Berg](#), *Discrete Numerical Modelling of the Interaction Between Broken Ice Fields and Structures*; Supervisor: Prof. Sveinung Løset, NTNU Trondheim, Department of Civil and Environmental Engineering.
- 2018 **Administrator** for the PhD committee of [Ying Tu](#), *Wave Slamming Forces on Offshore Wind Turbine Jacket Substructures*; Supervisor: Prof. Michael Muskulus, NTNU Trondheim, Department of Civil and Environmental Engineering.

- 2018 **Formal Examiner** for the PhD-thesis of [Aidan Bronson Bharath](#), *Numerical Analysis of Arrays of Wave Energy Converters*; Supervisor: Assoc. Prof. Irene Penesis, University of Tasmania, Australian Maritime College, National Centre for Maritime Engineering & Hydrodynamics.
- 2017 **Formal Examiner** for the PhD-thesis of [Ahmad Elhanafi](#), *Performance and Survivability of Offshore Oscillating Water Column Wave Energy Converters*; Supervisor: Assoc. Prof. Gregor Macfarlane, University of Tasmania, Australian Maritime College, National Centre for Maritime Engineering & Hydrodynamics.
- 2017 **International Expert Reviewer** for the PhD-thesis of [Adria Moreno Miquel](#), *Development, analysis, and comparison of two concepts for wave energy conversion in the Mediterranean Sea*; Supervisor: Assoc. Prof. Renata Archetti, University of Bologna, Department of Civil, Chemical, Environmental, and Materials Engineering.
- 2016 **Member of the Doctoral Committee** for [Pietro Danilo Tomaselli](#), *A methodology for air entrainment in breaking waves and their interaction with a mono-pile*; Supervisor: Prof. Erik Damgaard Christensen, Technical University of Denmark, Department of Mechanical Engineering.

Conference Organization and Editorial Work

- since 2020 **JHCS - Editor**, [Journal of Hydraulic and Coastal Structures](#), founding member of the editorial board, currently establishing a community driven open-access journal.
- since 2020 **RENEW - Scientific Committee**, [International Conference on Renewable Energies Offshore RENEW](#), Lisbon, Portugal.
- since 2020 **OMAE - Topic Organizer**, Wave Mechanics and Wave Effects, Ocean Engineering Symposium, [Conference on Ocean, Offshore and Arctic Engineering](#).
- 2019 - 2020 **OMAE - Topic Organizer**, Unsteady Hydrodynamics, Vibrations, Acoustics and Propulsion, Ocean Engineering Symposium, [Conference on Ocean, Offshore and Arctic Engineering](#).
- 2019 **Coastal Structures - Scientific Committee**, [Coastal Structures Conference 2019](#), Hannover, Germany.
- 2018 - 2019 **Session Organizer** for Coastal Engineering at "Ocean Week 2019 - Oceans in Change", [NTNU Oceans](#), a strategic research area on oceanic science and technology.

- 2018 - 2019 **JMSE - Guest Editor**, [Journal of Marine Science and Engineering](#), Special Issue "Computational Fluid Dynamics for Ocean Surface Waves".
- since 2017 **OMAE - Topic Organizer**, Free Surface Flow Topic, CFD & FSI Symposium, [Conference on Ocean, Offshore and Arctic Engineering](#).
- since 2017 **JOMAE - Associate Editor**, [ASME Journal of Offshore Mechanics and Arctic Engineering](#).
- 2016-2019 **MekIT - Scientific Comitee**, Member of the scientific committee of the MekIT conference ([National Conference on Computational Mechanics](#)), which takes place in Trondheim every two years.

Research Proposal Referee

- since 2023 **Proposal Reviewer**, [European Research Council \(ERC\)](#).
- since 2020 **Referee** in the domain "Applied and Engineering Sciences", [Dutch Research Council \(NWO\)](#).
- since 2018 **Program Council Member** of the research program "Marine Energy Conversion", [Swedish Energy Agency \(Energimyndigheten\)](#).

Research Management

- 2020-2021 **Deputy Head of Department for Research**, [Department of Civil and Environmental Engineering](#), NTNU Trondheim.
- 2020-2022 **Head of Research Group**, [Marine Civil Engineering](#), Department of Civil and Environmental Engineering, NTNU Trondheim.
- 2019-2021 **Research Committee**, [Engineering Faculty](#), NTNU Trondheim.
- 2019-2020 **Research and Innovation Committee**, [Department of Civil and Environmental Engineering](#), NTNU Trondheim.
- 2016-2019 **CoMEM - Master of Science in Coastal and Marine Engineering and Management** (Erasmus Mundus Masterprogramm at the NTNU Trondheim), Participation in the student program organization and preparation of a new EU proposal.

Publications

Citations

- Google Scholar: 3124 citations, h-index: 31
- Researchgate: 2622 citations, h-index: 29
- Scopus: 2397 citations, h-index: 28

Journal Articles

95. Larkermani E., Bihs B., Winckelmans G., Duponcheel M., Martin T., Müller B., Georges L.(2024), Development of an Accurate Central Finite-Difference Scheme with a Compact Stencil for the Simulation of Unsteady Incompressible Flows on Staggered Orthogonal Grids, submitted to *Journal of Computational Physics*.
94. Larkermani E., Bihs B., Winckelmans G., Duponcheel M., Martin T., Müller B., Georges L.(2023), High-Fidelity Explicit Large Eddy Simulations of Airflows Inside Buildings using Immersed Boundaries, submitted to *Building and Environment*.
93. Dempwolff L.C., Windt C., Bihs H., Holzwarth I., Melling G., Goseberg N. (2024), Hydrodynamic coupling of multi-fidelity solvers in REEF3D with application to ship-induced wave modelling, *Coastal Engineering*, Vol. 188, Nr. 104452, DOI: 10.1016/j.coastaleng.2023.104452.
92. Reidulff K., Wang W., Kamath A., Bihs H. (2023), Wave environment analysis at a Norwegian harbour for landbased aquaculture facilities using a combined phase-averaging and phase-resolving numerical modelling approach, *Journal of Coastal and Hydraulic Structures*, Vol. 3, DOI: 10.59490/jchs.2023.0031.
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89. Kamath A., Wang W., Martin T., Pakozdi C., Bihs H. (2023), Identification and Investigation of Extreme Events using an Arbitrary Lagrangian Eulerian approach with a Laplace equation Solver and Coupling to a Navier-Stokes Solver, *Journal of Offshore Mechanics and Arctic Engineering*, Vol. 145, Nr. 6, 061902, DOI: 10.1115/1.4057014.
88. Dempwolff L.C., Windt C., Melling G., Bihs H., Holzwarth I., Goseberg N. (2023), Approximating ship wave-induced hydraulic loading on estuarine groins: a conceptual numerical study, *Journal of Waterways, Port, Coastal and Ocean Engineering*, Vol. 149, Nr. 3, 021901, DOI: 10.1061/JWPED5.WWENG-19.
87. Pakozdi C., Kamath A., Wang W., Martin T., Bihs H. (2023), Efficient Calculation of Hydrodynamic Loads on Offshore Wind Substructures Including Slamming Forces, *Journal of Offshore Mechanics and Arctic Engineering*, Vol. 145, Nr. 2, 021901, DOI: 10.1115/1.4055701.

86. Wang W., Pakozdi C., Kamath A., Martin T., Bihs H. (2022), Hydrodynamic Coupling of Viscous and Non-Viscous Numerical Wave Solutions Within the Open-Source Hydrodynamics Framework REEF3D, *Journal of Offshore Mechanics and Arctic Engineering*, Vol. 144, Nr. 4, 041903, DOI: 10.1115/1.4053848.
85. Wang W., Pakozdi C., Kamath A., Bihs H. (2022), Representation of 3-h Offshore Short-Crested Wave Field in the Fully Nonlinear Potential Flow Model REEF3D::FNPF, *Journal of Offshore Mechanics and Arctic Engineering*, Vol. 144, Nr. 4, 041902, DOI: 10.1115/1.4053774.
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75. Dutta D., Bihs H., Afzal M.S. (2022), Computational Fluid Dynamics modelling of hydrodynamic characteristics of oscillatory flow past a square cylinder using the level set method, *Ocean Engineering*, Vol. 253, DOI: 10.1016/j.oceaneng.2022.111211.
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72. Martin T., Wang G., Kamath A., Bihs H. (2022), Modelling Open Ocean Aquaculture Structures using CFD and a Simulation-based Screen Force Model, *Journal of Marine Science and Engineering*, Vol. 10, Nr. 3, DOI: 10.3390/jmse10030332.
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Invited Presentations and Seminars (selection)

24. Bihs H. (2021), A CFD-Based Numerical Framework for Modelling Open Ocean Aquaculture Structures, *Invited Speaker*, SIAM Conference on Mathematical & Computational Issues in the Geosciences.
23. Bihs H. (2020), Introduction to the Open-source hydrodynamic framework REEF3D, *JIP - REEF3D Webinar*, Joint-Industry-Project: Reproducible Computational Fluid Dynamics (CFD) Modeling Practices for Offshore Applications.
22. Bihs H. (2020), REEF3D::FNPF - Wave Modeling for the Norwegian Coast, *NCE Aquatech Cluster lunch webinar*, Norwegian Aquaculture Technology Cluster.
21. Bihs H. (2020), Wave Modeling, *Invited Virtual Guest Lecture*, Department of Hydromechanics, Coastal and Ocean Engineering, Leichtweiß-Institute for Hydraulic Engineering and Water Resources, Technical University Braunschweig, Germany.
20. Bihs H. (2020), REEF3D::FNPF Large Scale Phase-Resolved Wave Modeling from Deep Water to the Coast, *Invited Virtual Guest Lecture*, Department of Naval Architecture and Ocean Engineering, Harbin Engineering University, China.
19. Bihs H. (2019), *REEF3D : Open-Source Hydrodynamics - Efficient and Accurate Multiscale Wave Modeling*, Department of Civil Engineering, IIT Bombay, Mumbai, India.
18. Bihs H. (2019), REEF3D : Open Source Hydrodynamics, *SPARC Workshop on Physical and Numerical Modeling in Coastal and Ocean Engineering*, Department of Applied Mechanics and Hydraulics, NITK Surathkal, Mangalore, India.
17. Bihs H. (2019), REEF3D : Open-Source Hydrodynamics - Efficient and Accurate Multiscale Wave Modeling, *Future Paths and Needs in Wave Modeling, SINTEF Ocean Workshop - Invited Speaker*, Trondheim, Norway.
16. Bihs H. (2019), REEF3D::FNPF - Efficient Phase-Resolved Wave Modeling for the Norwegian Coast, *PIANC-NTNU Marin Byggeteknikkdagen*, Department of Civil and Environmental Engineering, NTNU Trondheim, Norway.
15. Bihs H. (2019), Numerical Simulation of Wave Hydrodynamics with a Focus on Wave Structure Interaction *14. FZK-Kolloqium - Marine Resources and Renewable Energy - Invited Speaker*, Forschungszentrum Küste, Leibniz University Hannover, Germany.
14. Bihs H. (2018), REEF3D : Open-Source Hydrodynamics, *Hydraulic Engineering in Coastal Engineering, BAW*, Federal Waterways Engineering and Research Institute, Hamburg, Germany.

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12. Bihs H. (2018), REEF3D : Open-Source Hydrodynamics - Wave Modeling and Hydrodynamics, *Ocean Week 2018 - Oceans in Change*, Trondheim, Norway.
11. Bihs H. (2018), REEF3D : Open-Source Hydrodynamics - Modellierung von Wellen und Strömung, *Seminar at Leichtweiss-Institute for Hydraulic Engineering*, Technical University Braunschweig, Germany.
10. Bihs H. (2017), REEF3D : Open-Source Hydrodynamics, *Seminar at Franzius-Institute for Hydraulic, Estuarine and Coastal Engineering*, Leibniz University Hannover, Germany.
9. Bihs H. (2017), REEF3D : Open-Source Hydrodynamics, *Klima2050 Workshop*, Norwegian Geotechnical Institute (NGI), Oslo, Norway.
8. Bihs H. (2016), REEF3D : An Open-Source CFD Model for Coastal Engineering, *Invited Speaker, EU-Project Workshop Seditrans*, Instituto Superior Technico, Hydraulics and Water and Environmental Resources Section, Lisbon, Portugal.
7. Bihs H. (2016), REEF3D : An Open-Source CFD Model for Coastal Engineering, *PIANC-NTNU Marin Byggeteknikkdagen*, Department of Civil and Transport Engineering, NTNU Trondheim, Norway.
6. Bihs H. (2015), REEF3D : CFD in Hydraulic and Coastal Engineering, *Civil Engineering Association Seminar*, Department of Civil Engineering, IIT Bombay, Mumbai, India.
5. Bihs H. (2015), REEF3D : Open Source CFD, *REEF3D Workshop*, Department of Applied Mechanics and Hydraulics, NITK Suratkhal, Mangalore, India.
4. Bihs H. (2015), REEF3D : A Numerical Model for Wave Structure Interaction Problems, *Invited Speaker, Special Session at the 8th International Conference on Asian and Pacific Coasts*, IIT Madras, Chennai, India.
3. Bihs H. (2014), PhD Forskning : Marin Byggeteknikk, *NTNU-Kystverket Meeting*, Norwegian Coastal Administration, Kabelvag, Norway.
2. Bihs H. (2011), REEF3D : A New Numerical Model for the Calculation of Complex Free Surface Flows, *Seminar, Georgia Tech, School of Civil and Environmental Engineering*, Atlanta, USA.
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Review Activities

Reviewer for the following journals:

- Ocean Engineering
- Applied Ocean Research
- Ocean Modelling
- Ocean Dynamics
- Marine Structures

- Aquaculture Engineering
- Coastal Engineering
- Journal of Waterways, Port, Coastal and Ocean Engineering
- Journal of Offshore Mechanics and Arctic Engineering
- Journal of Coastal Research
- Journal of Hydrodynamics
- Journal of Fluids and Structures
- Journal of Ocean Engineering and Marine Energy
- Marine Georesources & Geotechnology
- Energy
- Wind Energy
- International Journal of Naval Architecture and Ocean Engineering
- Journal of Marine Science and Engineering
- Journal of Marine Science and Technology
- Journal of Marine Science and Applications
- China Ocean Engineering
- Computers and Electronics in Agriculture
- Journal of Computational Physics
- Computers & Fluids
- International Journal of Numerical Methods in Fluids
- Applied Mathematics and Computation
- Applied Mathematical Modelling
- SoftwareX
- Journal of Hydraulic Research
- Journal of Hydraulic Engineering
- Water Resources Research
- Advances in Water Resources
- Water
- European Journal of Mechanics / B Fluids
- Fluid Dynamics Research
- Engineering Applications of Computational Fluid Mechanics
- Natural Hazards
- Physics and Chemistry of the Earth

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