UNITED NATIONS UNIVERSITY
UNU-EHS
Institute for Environment and Human Security

LIPI

FRANZIUS-INSTITUTE for Hydraulic, Estuarine and Coastal Engineering
Leibniz Universität Hannover

Second International TWIN-SEA Workshop

Climate and Societal Change in Coastal Areas in Indonesia and South East Asia

Prof. Dr. J. Rhyner (UNU-EHS) and Prof. Dr. T. Schlurmann (FI-LUH)

SPONSORED BY THE
Federal Ministry of Education and Research

FKZ: 01DP13005

Internationales Büro

Framework and objective

- **Why Twin-Sea in Indonesia *(back in 2013)*?**
  - ➢ Post-2015 agenda process – Focus on disaster-prone emerging economies
  - ➢ Research perspective: New approach to environmental research by Future Earth initiative with focus on urbanization in coastal regions
  - ➢ Background and partners from tsunami-related projects (i.e. GITEWS et al.)
- **Objective**: "Creating a research network in SEA with German universities for improving preparedness and developing "low-regret" adaptation measures and strategies to climate change and its related effects induced by natural hazards in the coastal zones in SEA with focus on Indonesia"
- Objectives are in full correlation with **Sendai Framework for DRR 2015-2030** adopted at WCDRR 14 to 18 Mar 2015, e.g.
  - Enhanced work to reduce exposure and vulnerability; action on DR drivers
  - Tackling on unsustainable uses of natural resources and declining ecosystems

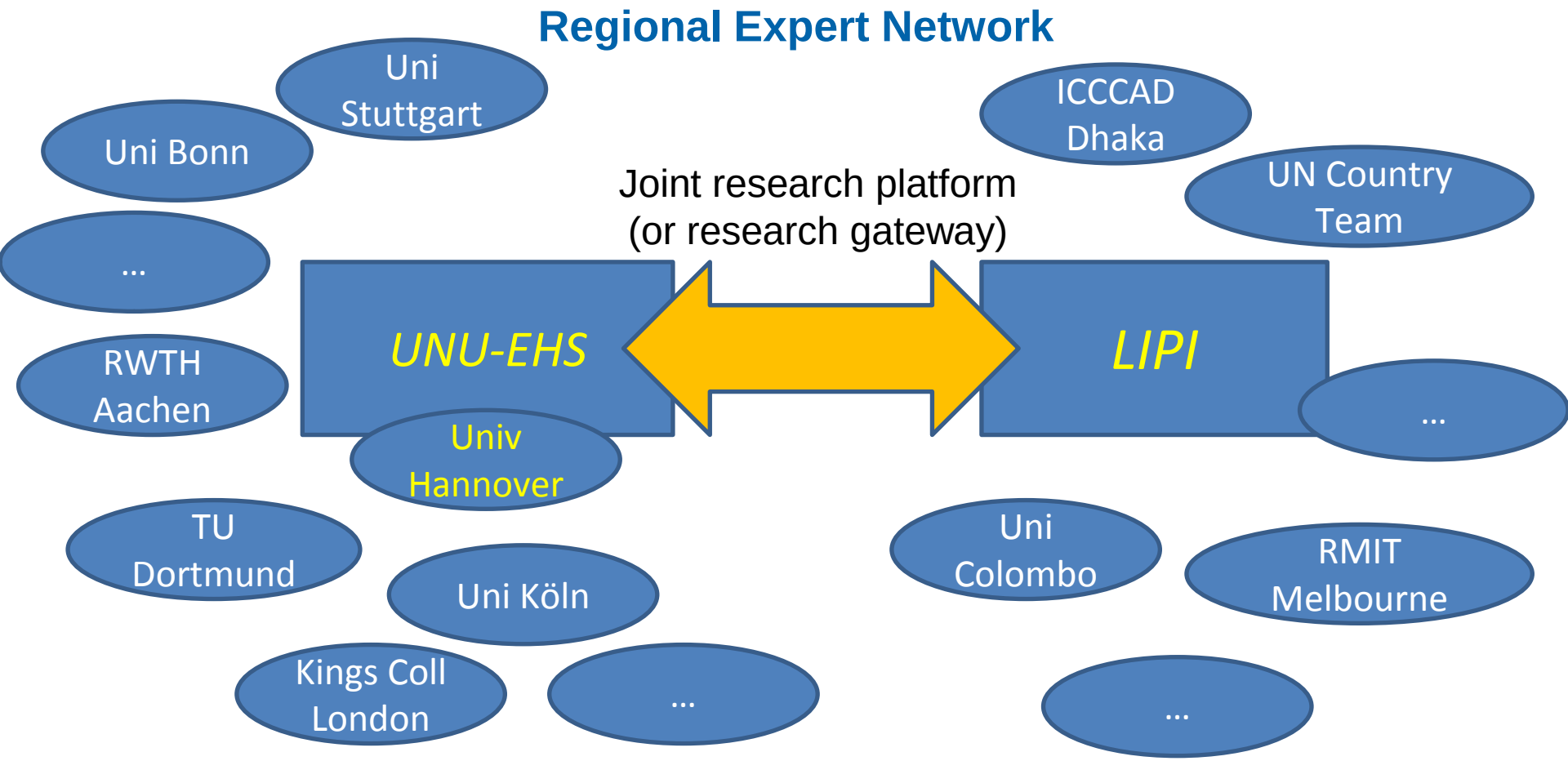
  through technology and research, enhancing multi-hazard early warning systems and by means of enhanced international cooperation

UN World Conference on Disaster Risk Reduction
14-18 March 2015, Sendai, Japan

Framework and objective

- **Project period**:
  - July 2013 to June 2015 (initial phase): Knowledge generation, development of e-learning material and the development of adaption strategies, **assessment of joint research platform**
  - July 2015 to June 2017 (follow-up phase): Joint research, Identification of business cases and orientation towards **implementation of a joint research platform**
- **Partners:** UNU-EHS, LIPI, Univ. Hannover, Expert network (Univ.)

Framework and objective



Research outline and organization

Outreach/ Dissemination

Involvement of policy makers in workshop

Knowledge exchange with e.g. IPCC, GIZ, UNESCO, UNDP, Indonesian ministries

Presentation at International Climate Talks of UNFCCC

Futher distribution through networks of partners

Output

Findings on vulnerability to CC and natural hazards

Findings on risk reduction & adaptation measures

Joint research platform (or research gateway)

eLearning material

Scientific publications

New joint projects

Coordination

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TWIN-SEA network

Research activities & development of a research network

Contribution from network partners through scientific expertise & distribution of research results

Scientific network partners from Universities and Research Institutions

Network Activities

- 1st scientific workshop in Jakarta 2014
  2nd workshop & field trip 23-27 Mar 2015
- Consolidation of working groups and work plan, joint research activities
- Project-affiliated Dr. F. Renaud based in Jakarta (Aug. 2013-Aug 2015) funded by UNU-EHS)
- Expert exchange and collaboration
  - Prof. Yekti (LIPI) to Bonn (6 weeks)
  - G. David (FI) to Indonesia (3 weeks)
  - J. Risandi (MAAF) to Hanover (6 weeks)

Scientific Outcome

- Surtiari, G.A.K.; Garschagen, M.; Birkmann, J.; Setiadi, N.; Maunati, Y (in review): ***Coastal Resilience in Indonesia: From Planning to Implementation.*** In: Greiving, S.; Ubaura, M. & Teslier, J. (eds.): Spatial Planning and Resilience Following Disasters: International and Comparative Perspectives. Policy Press. Bristol.

- Surtiari, G.A.K.; Maunati, Y; Garschagen, M.; Birkmann, J. (2014): ***Flood governance of Jakarta, Indonesia: Identifying societal and political processes in climate change adaptation.*** Oral Presentation. International Conference on Deltas in Times of Climate Change II, 24-26 September 2014, Rotterdam, The Netherlands.

- Maunati, Y; Garschagen, M.; Birkmann, J.; Surtiari, G.A.K. (in preparation): ***Potential Conflicts on implementation of Spatial Master Plan and the Challenges of Law Enforcement: A Case of North Jakarta.*** (to be submitted to an international peer-reviewed journal in spring 2015).

- David, C.G.; Schulz, N.; Schlurmann, T. (2014): **Assessment of performance and durability of ecosystem-based and Low-Regret coastal protection measures in Disaster Risk Reduction.** In: *Partnership for Environment and Disaster Risk Reduction (PEDRR), Editors: Fabrice G. Renaud, Karen Sudmeier-Rieux, Marisol Estrella and Udo Nehren.* (under review)

- Schlurmann, T; David, G; Schulz, N (2014): **Low-regret adaptation measures – The way forward in Coastal Engineering?** *Proc. of the Taiwan-EU Symposium on Ocean Observation and Its Application*, pp. 73-79. College of Engineering, National Cheng Kung University, Tainan, Taiwan

- Schlurmann, T (2015): **„Low-regret“ Anpassungsmaßnahmen im Küsteningenieurwesen Chancen für Forschung und Entwicklung!** *10. FZK – Kolloquium - Klimafolgen & Küstenschutz -Risiken und Anpassungsstrategien;* Fachbeiträge aus Wissenschaft und Praxis, FZK, Hannover

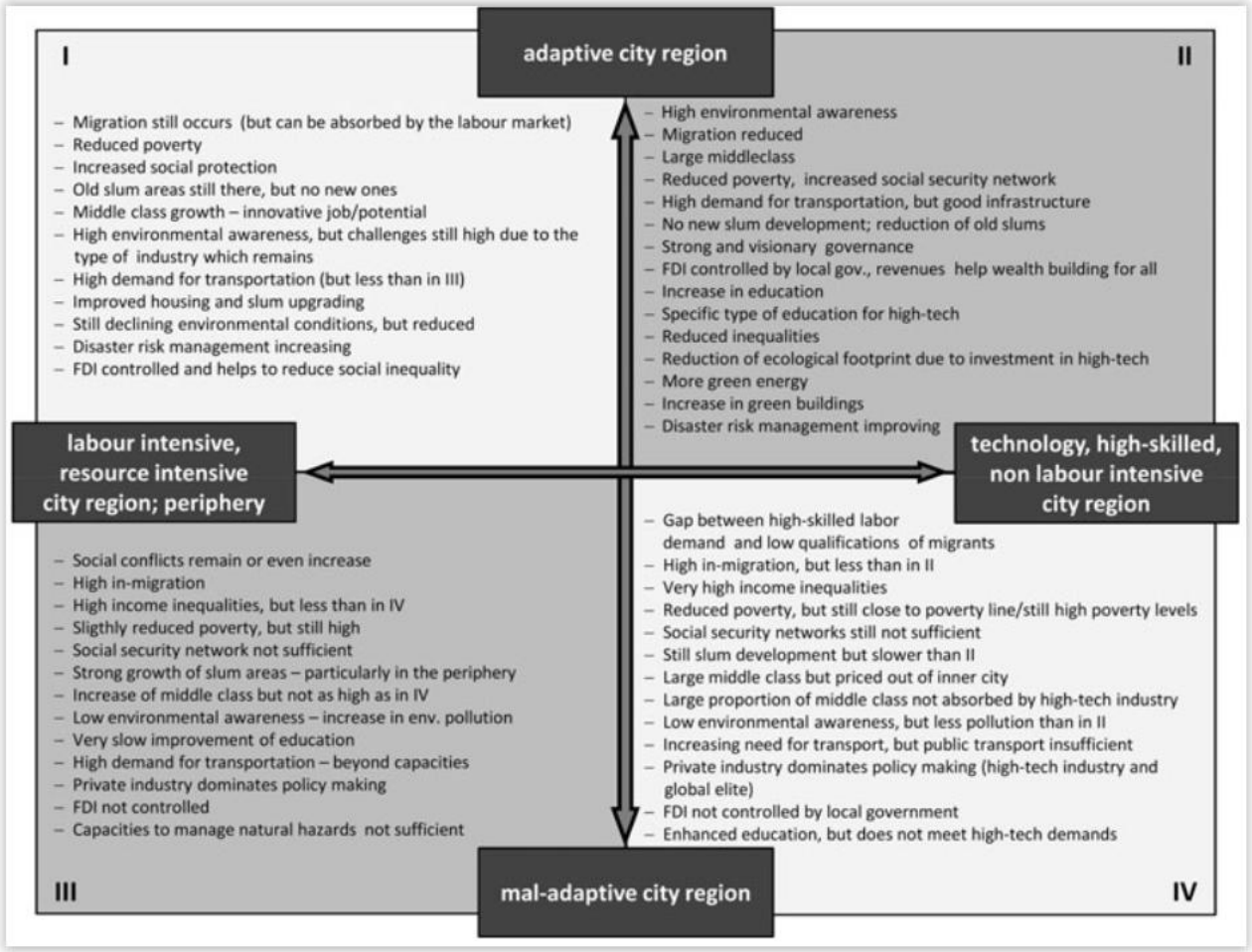
Working Groups

WG1

Coastal management and low-regret adaptation	Role of ecosystem services in coastal hazards, risk and vulnerability assessment	**WG3** Socio-economic vulnerability and risk (including scenarios), development pathways, societal change	**WG4** Role of educational activities (e.g. E-learning) in promoting DRR & CCA
Identification of problems / questions			
State of the art and knowledge gaps			
Shaping of key research questions			
Workplan for collaboration: who (institutions/persons), what (research object), how (methods/data available), where (case studies), timeframe, expected outcomes, other potential collaborators			
Facilitators: Dr. A. Syahailatua, Prof. J. Handmer Prof. T. Schlurmann,	**Facilitators**: Dr. Heru Santoso Dr.F. Renaud,	**Facilitators:** Prof. Robert Delinom, Prof. Yekti Maunati, Dr. M. Garschagen Prof. J. Birkmann,	**Facilitators**: Dr. R. F. Lubis Dr. J Szarzynski, Dr. E. Tambo,

Products: Progress on scenarios for vulnerability

Birkmann et al, 2013. Scenarios for vulnerability: opportunities and constraints in the context of climate change and disaster risk. *Climatic Change*, pp 1-16



Participatory scenario development – case study Jakarta

Products: Vulnerability and Pathways for Adaptation (Jakarta)

- Structural and non-structural measures for **flood response in JakartaCity**

City level	Implementation
Canal construction	Ongoing process (continuing past period program)
Dyke	Along the Northern part of Jakarta – had been done
Giant Sea wall	Still in progress in socio economic assessment (by consultant)-consultation process between consultant and government
Reclamation (it would be for 21 small islands in Northern part of Jakarta)	Ongoing (developer)
Normalization of reservoir areas (lakes that already narrowed because they are occupied for illegal housing)	Ongoing (Jakarta government and local state own company))
Normalization of river (river has been narrowed because the sedimentation and it occupied by illegal building)	Ongoing (Jakarta government within World Bank soft loan)
Early warning system	By public work agency and local disaster and mitigation agency
Relocation (especially for people who living in vulnerable and occupying reservoir and river bank areas)	National Housing and settlement ministry and Housing and settlement agency of Jakarta

Products: Vulnerability and Pathways for Adaptation (Jakarta)

- Informal adaptation measures in Jakarta (**researched in three pilot sites** in N-Jakarta)

Household level	Implementation
Elevating the house	By their own initiative and own financial support
Putting sacks of shells surrounding the house (to protect house from inundation)	Individual initiative
Looking for another job (especially for people who work as traditional fisherman)	Individual initiative
Looking for side job for increasing their income (traditional fisherman have been faced problem regarding the reducing fish production due to the sea pollution from reclamation construction and due to the uncertainty weather).	Individual initiative
Changing water sources (from local wheel to buying clean water)	Individual initiative
Constructing a small reservoir surrounding their areas (to retain over flowing water)	Community initiative
Local early warning system	Information from local mosque
Household member/ Women empowerment (to increase their quality of live in facing uncertainty)	Facilitated by NGO (Indonesian Red Cross)

Products: Working with Nature (WwN)

- Sustainment and reforestation of mangrove belts to allow multi-functional services to coastal environments, i.e. protection, buffering, filtering and breading places

Coastal stabilzation by mangrove reforestation (Test site in North Jakarta)

☞ Presentation by G. David (FI) and J. Risandi (MAAF)
Tuesday afterrnoon (last session)

Products: Working with Nature (WwN)

- Beach revetment by means of ecologically-friendly materials (degradable) and other beneficial characteristics, i.e. availability, experiences, identification, local work forces

Coir fibres (from coconuts)

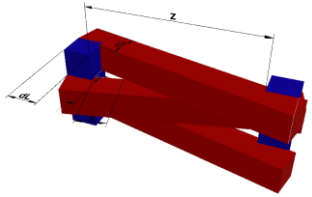
Production process, Yogyakarta, Java

Final revetment product

Products: Working with Nature (WwN)

- Beach revetment by means of ecologically-friendly materials (degradable) and other beneficial characteristics, i.e. availability, experiences, identification, local work forces

Coconut fiber geotextiles as beach revetment

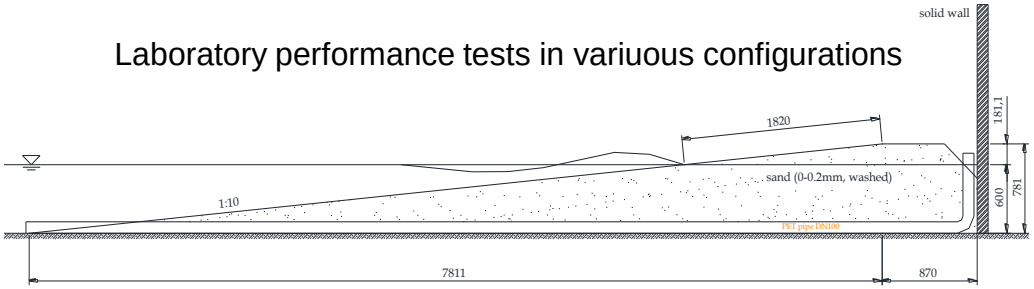


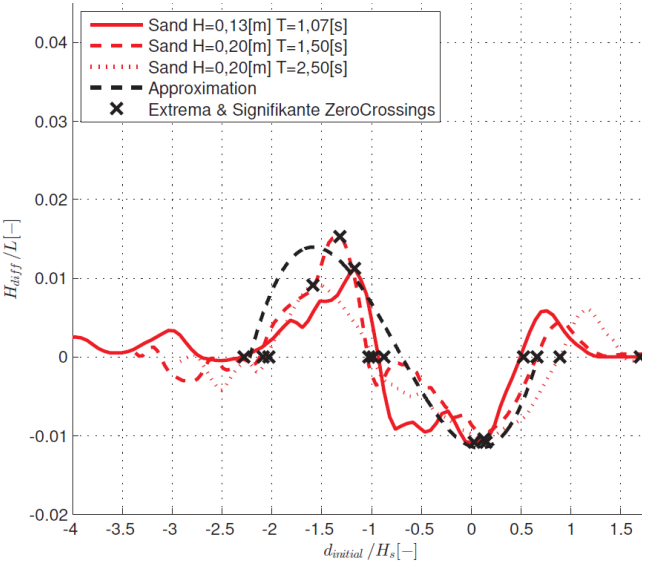
Performance test site, Tabanan, Bali

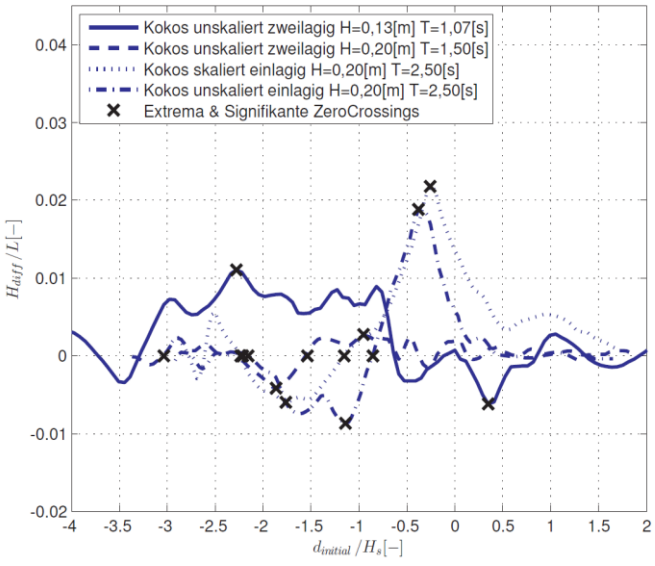
Products: Working with Nature (WwN)

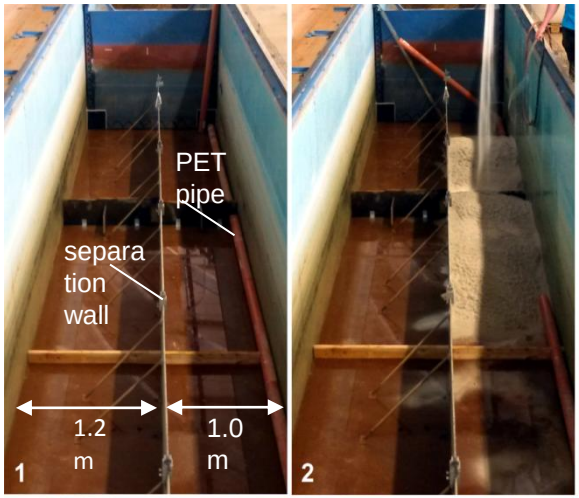
- Beach revetment by means of ecologically-friendly materials (degradable) and other beneficial characteristics, i.e. availability, experiences, identification, local work forces

Laboratory performance tests in variuous configurations



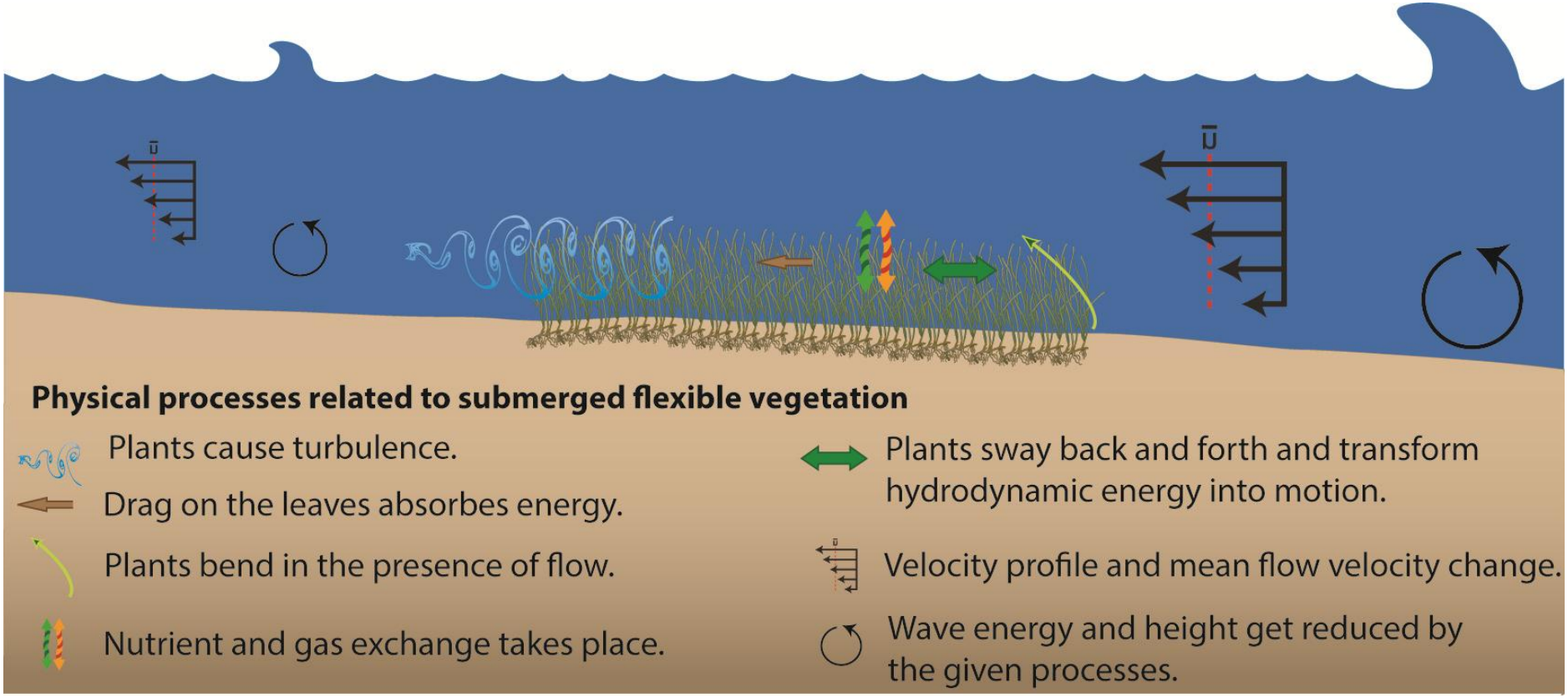






Products: Working with Nature (WwN)

- Wave attenuation over coastal salt marshes within intertidal and tidal areas of variable hydrodynamic forcing under storm surge conditions in full scale (GWK)



Paul, M.; Gillis, L.G. (2015). Marine Ecology Progress Series 523, 57-70, doi: 10.3354/meps11162

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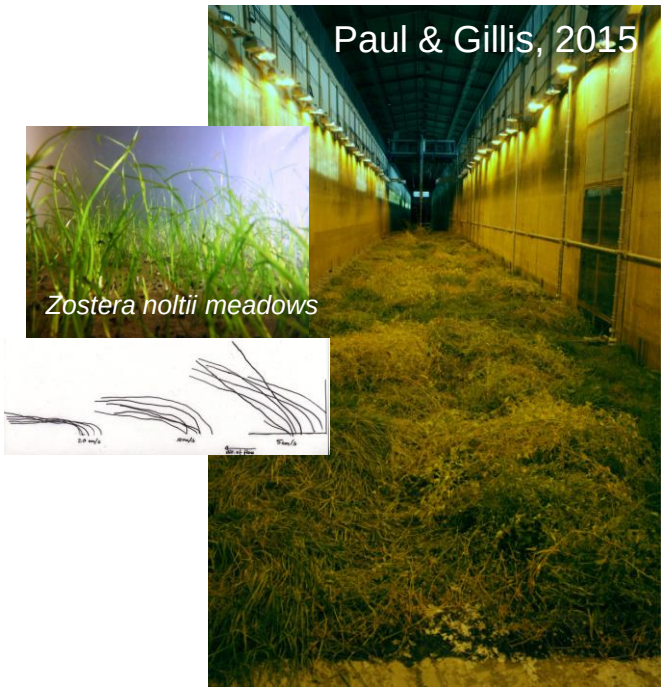
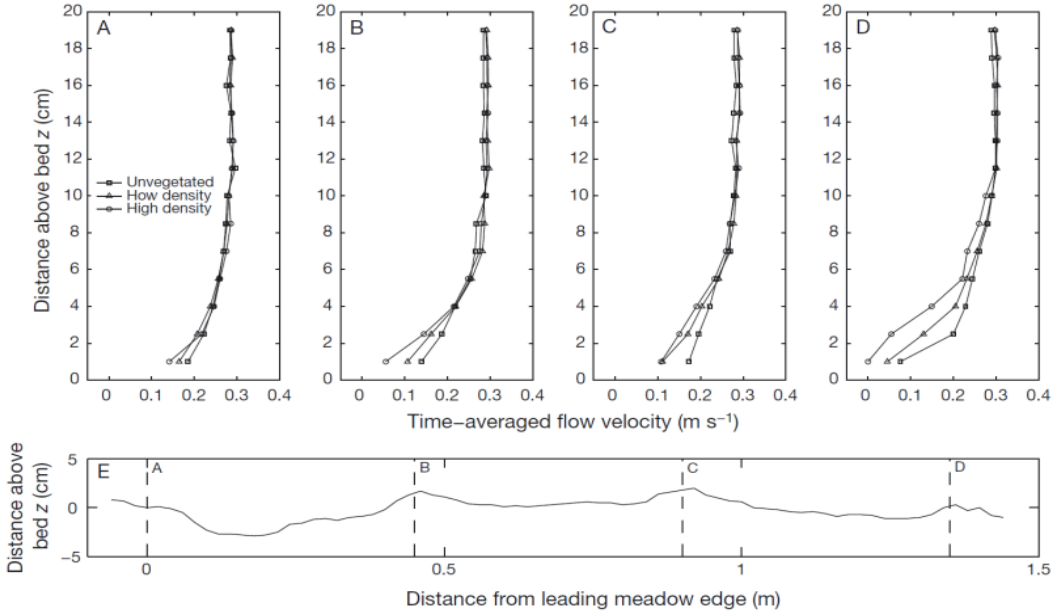


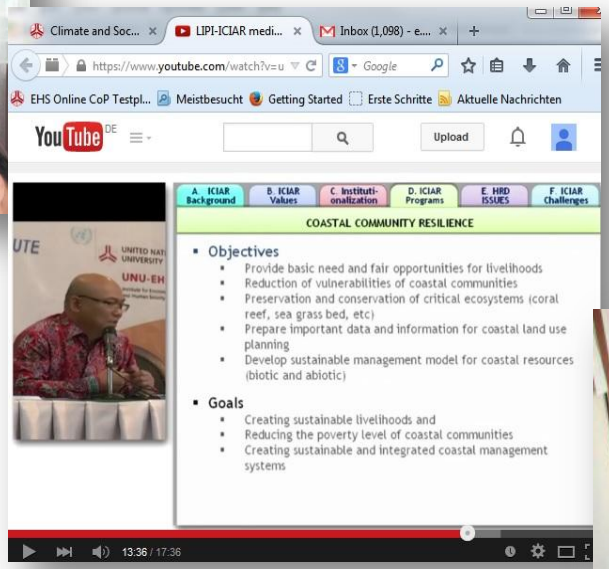
Fig.: Time-averaged velocity *(u) profiles for different Zostera noltii shoot densities at an applied flow velocity of 0.3 m/s*



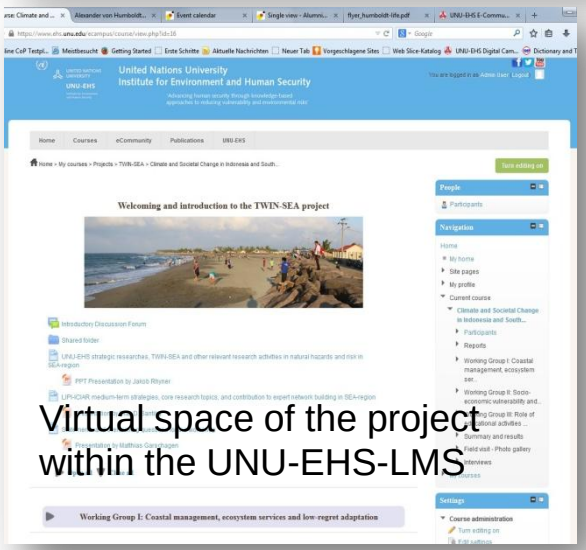
- First results: i) Waves in storm surge conditions can be reduced by 20%, but 60% of this reduction are due to the vegetation biomass; ii) Vegetation breaks off and gets damaged, but the soil surface stays intact and does not erode!

Products: E-Learning materials

Capturing and processing of lectures / presentations



Internet-based TwinSEA lectures



Virtual space of the project within the UNU-EHS-LMS

- E-Learning platform and webinars
- Interviews with high-level experts
- Educational material DVD

Ongoing and planned work in 2015 (Working Groups)

- **<u>Assessment of joint research platform and deliver draft roadmap on how to achieve</u>**

- **Working Group I**
  - Questionnaire on ECO-DRR (…how decision-making on coastal defenses is taken in Indonesia?) by Dr. F. Renaud (Tuesday afternoon session)
  - Ongoing research on soft-protection measures, i.e. other interesting and relevant examples (bamboo breakwater, etc.)
  - Exchange of four MSc students from Hannover to Indonesia in between Apr-Jun 2015

- **Working Group II**
  - Ongoing fieldwork in Jakarta (Mrs. A. Surtiari and Prof. Yekti Maunati)
  - Empirical research in pilot region and exchange of students (Mr. Iker Urdangarin)

- **Working Group III**
  - Organization of webinars
  - Integration of educational materials to course
  - Migration of the virtual environment to a partner in Indonesia
  - Stand-alone e-learning platform

Plan for 2015 and beyond (Network)

- **Strengthening of partner network**
  - TWIN-SEA Workshop 2015 (Jakarta, 23-27 Mar 2015)
  - Continued exchange of German and Indonesian experts; Exchange program for students

- **Collaboration within the scientific scope of the Working Groups**
  - Joint publication and networking
  - **Implementation of joint research platform (or research gateway) in between LIPI and UNU-EHS (Phase 2)**

- **Integration of private sector**
  - Participation of companies and consultants in the workshop
  - Evaluation of feasibility and suitability in progressed joint research approaches
  - Broadening of exchange activities between German and South-East-Asian experts to the private sector (“liaison management” by Twin-SEA)

Thanks for your kind attention!

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