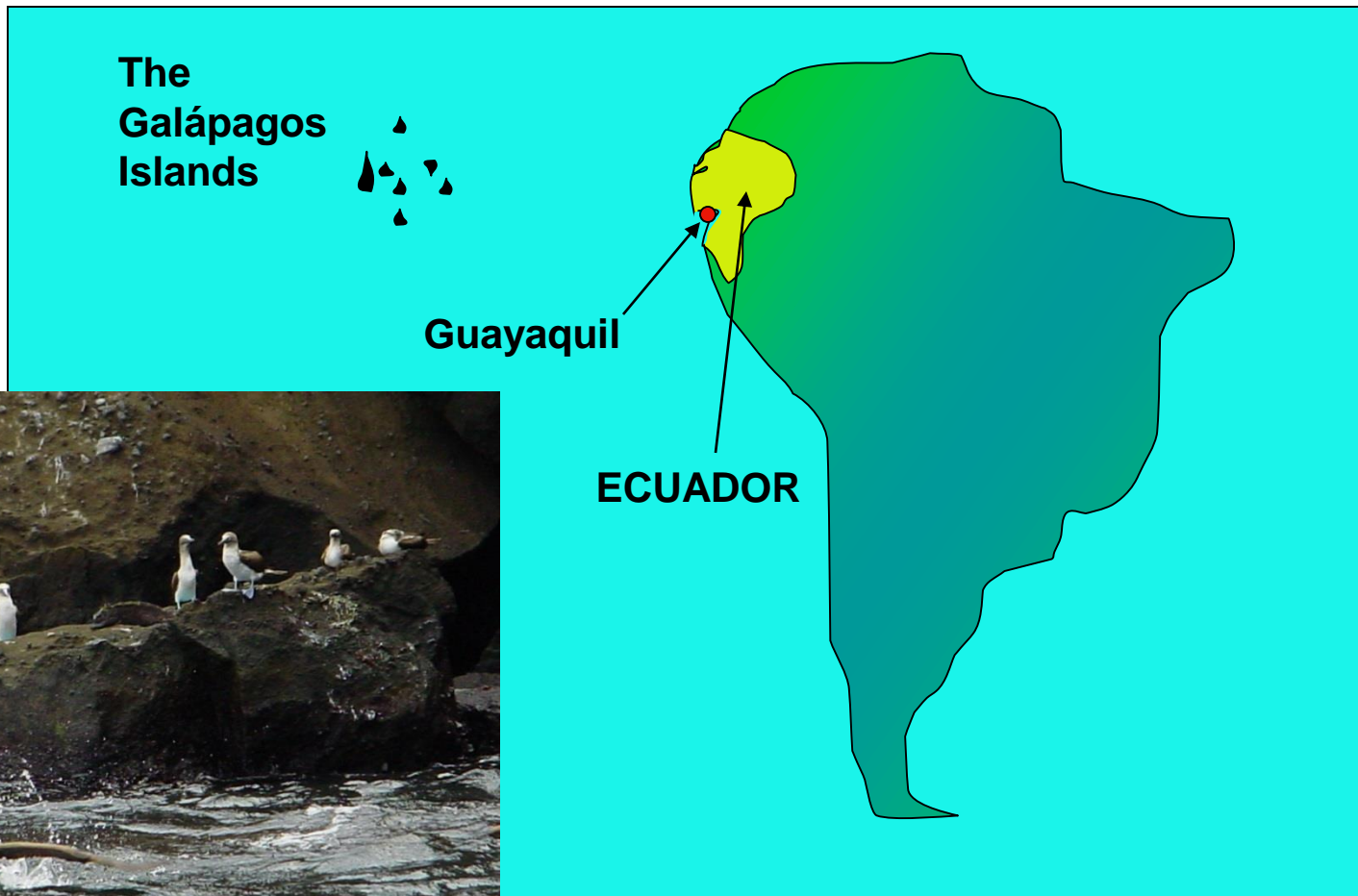




Biological monitoring activities related to the VLIR Ecuador Network



Ecuador and the Galápagos Islands



Flemish network partners

Institution	Name	Role
Ghent University	Peter Goethals	Coordinator
	Martin Valcke	Education
UAntwerp	Wim Vanden Berghe	Biodiscovery
VUB	Willy Bauwens	Water Resources Management
UHasselt	Ziv Zhkedy	Statistics
KULeuven	Guido Wyseure	IUC link
HOGent	Christine Van der heyden	Lab safety and quality

General Activities

1. **Design, implementation and operation of two masters programs in Bio-discovery and Water Resources Management (cf slide 6)**
2. Implementation of Educational Support Strategies and tools in order to promote innovations both in classes and in other learning environments
3. Education support oriented research
4. **Integrated network activities (cf slide 6)**
5. Short trainings in Belgium
6. Workshops, trainings and conferences

Two Master programmes

- Co-operation among four universities
- Research based education concept
- Both programmes accepted by local government and started this year: about 20 students in each programme



Integrated network activities

- Starting from research and policy questions
- Research design
- Monitoring and lab analysis
- Communication skills
- Involvement of stakeholders



International cooperation

Skill development, knowledge exchange,
more valuable datasets

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PLOS ONE

Comparison of the Abiotic Preferences of Macroinvertebrates in Tropical River Basins



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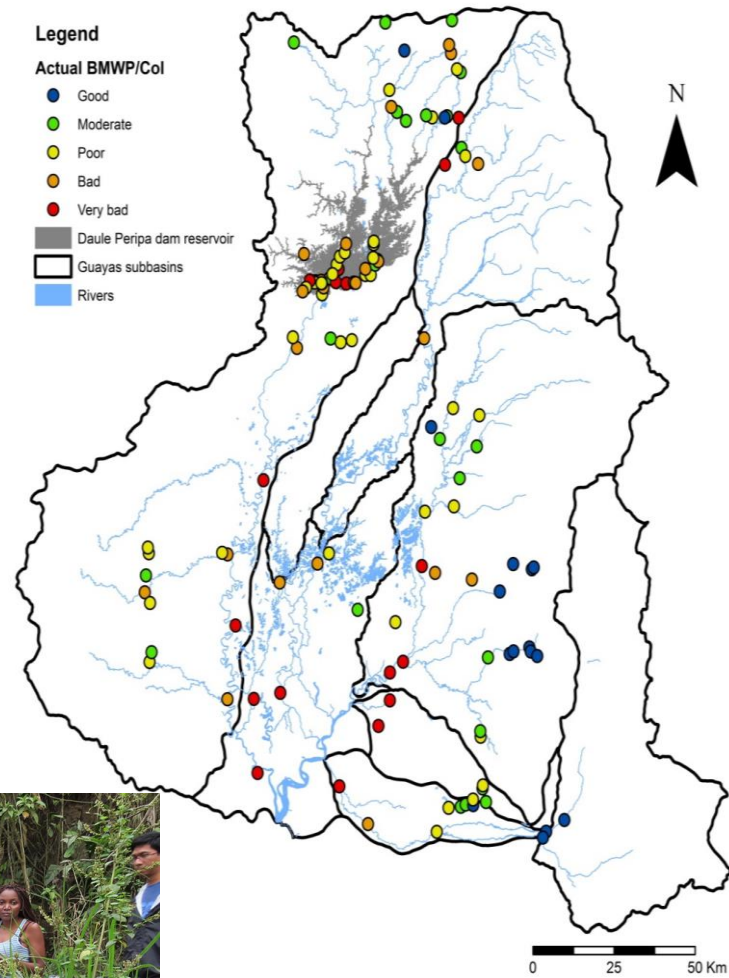
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Abstract

We assessed and compared abiotic preferences of aquatic macroinvertebrates in three river basins located in Ecuador, Ethiopia and Vietnam. Upon using logistic regression models we analyzed the relationship between the probability of occurrence of five macroinvertebrate families, ranging from pollution tolerant to pollution sensitive, (Chironomidae, Baetidae, Hydroptilidae, Libellulidae and Leptophlebiidae) and physical-chemical water quality conditions. Within the investigated physical-chemical ranges, nine out of twenty-five interaction effects were significant. Our analyses suggested river basin dependent associations between the macroinvertebrate families and the corresponding physical-chemical conditions. It was found that pollution tolerant families showed no clear abiotic preference and occurred at most sampling locations, i.e. Chironomidae were present in 91%, 84% and 93% of the samples taken in Ecuador, Ethiopia and Vietnam. Pollution sensitive families were strongly associated with dissolved oxygen and stream velocity, e.g. Leptophlebiidae were only present in 48%, 2% and 18% of the samples in Ecuador, Ethiopia and Vietnam. Despite some limitations in the study design, we concluded that associations between macroinvertebrates and abiotic conditions can be river basin-specific and hence are not automatically transferable across river basins in the tropics.

Some pictures made during
integrated case studies

Guayas river basin: hydropower and agriculture



Antisana (Volcano with lake serving as major source of drinking water for Quito)



Amazon (including oil spillage)



Ibarra (lake research)



Some research results



- Relationship between the occurrence of invasive water hyacinth and water quality properties & macroinvertebrates diversity is assessed at Daule-Peripa reservoir, Ecuador
- ↑ hyacinth cover ↓ turbidity
- Water hyacinth positively affects diversity of macroinvertebrates



Some research results

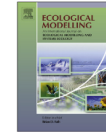
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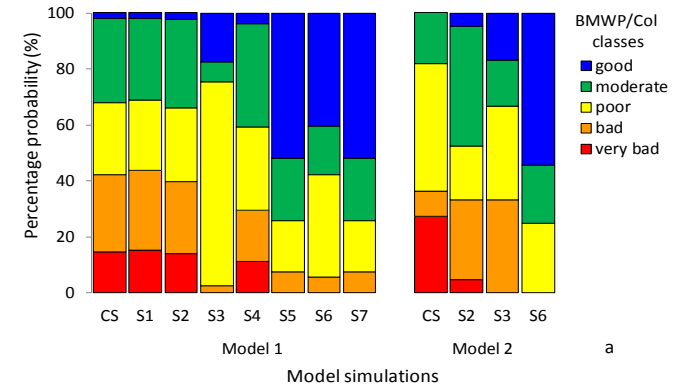


Bayesian belief network models to analyse and predict ecological water quality in rivers



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Thi Hanh Tien Nguyen^{a,d}, Minar Naomi Damanik Ambarita^a, Peace Liz Sasha Musonge^a,
Pieter Boets^a, Gert Everaert^a, Luis Dominguez-Granda^c, Peter L.M. Goethals^a

- Chemical, physical, hydromorphological, biological (macroinvertebrates) variables were collected at Guayas River basin
- BBN models were developed to analyse and predict ecological water quality
- Flow velocity is the major variable influencing ecological water quality.



Scenario	COD reduction	Chlorophyll reduction	Reconstruction of natural water velocity
S1	x		
S2		x	
S3			x
S4	x	x	
S5	x		x
S6		x	x
S7	x	x	x

**Thank you for
your attention**