Biological monitoring activities related to the VLIR Ecuador Network
Ecuador and the Galápagos Islands
# Flemish network partners

<table>
<thead>
<tr>
<th>Institution</th>
<th>Name</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghent University</td>
<td>Peter Goethals</td>
<td>Coordinator</td>
</tr>
<tr>
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<td>Martin Valcke</td>
<td>Education</td>
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<tr>
<td>UAntwerp</td>
<td>Wim Vanden Berghe</td>
<td>Biodiscovery</td>
</tr>
<tr>
<td>VUB</td>
<td>Willy Bauwens</td>
<td>Water Resources Management</td>
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<tr>
<td>UHasselt</td>
<td>Ziv Zhkeddy</td>
<td>Statistics</td>
</tr>
<tr>
<td>KULeuven</td>
<td>Guido Wyseure</td>
<td>IUC link</td>
</tr>
<tr>
<td>HOGent</td>
<td>Christine Van der heyden</td>
<td>Lab safety and quality</td>
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</tbody>
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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

Comparison of the Abiotic Preferences of Macroinvertebrates in Tropical River Basins

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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

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

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- 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.
Thank you for your attention