5th international conference on
Soil, Bio- and Eco-Engineering

Conference venue:
Museum of natural history
Bernastrasse 15, 3005 Bern, Switzerland

Hosts:
Bern University of Applied Sciences, EcorisQ

For more info and registration
www.ecorisqevents.com
**Congress SBEE2021**

As in the preceding SBEE conference series, we will bring together researchers, practitioners, geotechnical and civil engineers, biologists, ecologists, geomorphologists and foresters to discuss current problems in soil-resource sustainability, soil-erosion and slope-stability research, and how to address these problems using soil, bio- and eco-engineering techniques.

**Conference topics include**

- Root-soil interactions and distribution
- Root reinforcement
- Soil erosion and conservation
- Riverbank and coastline protection measures
- Slope stability modelling
- Effects of vegetation on hillslope hydrology
- Bioengineering, ecology and biodiversity
- Eco-DRR measures, protection forests, and soil bioengineering
- Risk management and decision support systems
- Benefits and liabilities in slope and erosion control

**Conference schedule (19th-25th June)**

<table>
<thead>
<tr>
<th>Time</th>
<th>21th Mon</th>
<th>22nd Tue</th>
<th>23rd Wed</th>
<th>24th Thu</th>
<th>25th Fri</th>
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<tbody>
<tr>
<td>8.30 a.m. - 10 a.m.</td>
<td>Keynote S1</td>
<td>Keynote S4</td>
<td>Keynote S8</td>
<td>Excursion</td>
<td>Pratical courses</td>
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<tr>
<td>10.30 a.m. - 12 a.m.</td>
<td>Keynote S5</td>
<td>Excursion</td>
<td>Pratical courses</td>
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<tr>
<td>1.30 p.m. - 3 p.m.</td>
<td>Keynote S2</td>
<td>Keynote S6</td>
<td>Keynote S9</td>
<td>Excursion</td>
<td>Pratical courses</td>
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<td>3.30 p.m. - 5 p.m.</td>
<td>Keynote S3</td>
<td>Keynote S7</td>
<td>Keynote S10</td>
<td>Excursion</td>
<td>Pratical courses</td>
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<td>5.30 p.m. - 7 p.m.</td>
<td>Posters Apero</td>
<td>Vineyard Apero</td>
<td>Excursion</td>
<td>EcorisQ GA</td>
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<tr>
<td>Evening</td>
<td>-</td>
<td>Dinner</td>
<td>-</td>
<td>Excursion</td>
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Scientific sessions (at Museum of natural history, Bern)

MONDAY - June 21st

8.30 Morning Coffee
8.45 Welcome Speech

S1_ROOT DISTRIBUTION AND REINFORCEMENT MODELING AND MEASUREMENT (Chair: Stokes A.)

9:00 TALK Root distribution modelling of tree species in different environmental conditions (Perona P.)
9:15 VIDEO A three-dimensional analytical model for the mobilisation of root-reinforcement in direct shear conditions (Meijer G.)
9:30 TALK Exploiting a root topological model based on Leonardo’s Rule to estimate additional root cohesion (Arnone E.)
9:40 Discussion Board
9:55 Coffee Break

10:20 TALK Keynote: Methods for the quantification of root reinforcement (Giadrossich F.)
10:50 VIDEO Root failure location during tensile testing is driven by tissue age (Loades K.)
11:00 VIDEO Power-law strength-diameter relation enhanced by drying in grass roots (Ekeoma E.)
11:10 Discussion Board
11:30 Coffee Break

11:45 VIDEO Root reinforcement on quarry deposits: a study case from the Carrara Marble extraction site (Mauriello C.)
11:55 VIDEO The influence of forest structure on root reinforcement modelling: a study in the Northeastern Italian Alps (Cislaghi A.)
12:05 Discussion Board
12:15 Lunch Break

S2_SURFACE EROSION AND VEGETATION
(Chair: Burgos S.)

13:45 TALK ONLINE Keynote: Influence of vegetation on soil erosion processes (Poesen J.)
14:15 TALK Wood logs biomechanics at the laboratory scale (Bau V., Perona P.)
14:25 TALK A case study: the assessment of erosion processes related to service road networks in a steep-slope banana cultivation in southern Brazil (Hoerbinger S.)
14:35 Discussion Board
14:55 Coffee Break

S3_SHALLOW LANDSLIDES AND VEGETATION ON HILLSLOPE SCALE (Chair: Giadrossich F.)

15:15 VIDEO Keynote: Review on methods to quantify the effect of root reinforcement on shallow landslides (Mao Z.)
15:45 VIDEO Applying the SOSlope model to evaluate apparent root cohesion estimates for the monitored CB1 landslide in the Oregon Coast Range, USA (Schmidt K.)
15:55 Discussion Board

Poster Apero starting at 16:10
### Scientific sessions (at Museum of natural history, Bern)

#### **TUESDAY - June 22nd**

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<thead>
<tr>
<th>Time</th>
<th>Session Details</th>
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<tr>
<td>8:30</td>
<td>Morning Coffee</td>
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<tr>
<td>9:00</td>
<td><strong>S4. SHALLOW LANDSLIDES AND VEGETATION ON CATCHMENT SCALE</strong> (Chair: Phillips C.)</td>
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<td>9:00</td>
<td><strong>TALK ONLINE.</strong> Keynote: Vegetation effects on shallow landslide processes at catchment scale (Hales T.)</td>
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<td>9:30</td>
<td><strong>VIDEO.</strong> Characteristics of bedload transport in forest-damaged areas, Republic of Korea (Junpyo S.)</td>
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<td>9:45</td>
<td>Discussion Board</td>
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<td>10:00</td>
<td>Coffee Break</td>
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<tr>
<td>10:15</td>
<td><strong>VIDEO.</strong> A case study on the hydraulic control of the rhizosphere on rainfall-induced shallow landslides (Balzano B., Tarantino A.)</td>
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<td>10:25</td>
<td><strong>VIDEO.</strong> Triaxial shear behaviour of root-reinforced soil (Karimzadeh A.)</td>
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<td><strong>S5. HYDROPEDOLOGY AND VEGETATION</strong> (Chair: Rauch H.P.)</td>
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<td><strong>VIDEO.</strong> Plant-soil interactions can enhance climate adaptation control technologies for urban spaces (Boldrin D.)</td>
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<td><strong>VIDEO.</strong> The turning resistance of trees in highly moist soil conditions (Fan C. C.)</td>
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<td><strong>VIDEO.</strong> Development of shrubby willows on a test levee and their impact on the seepage (Sokopp M.)</td>
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<td>13:45</td>
<td><strong>TALK.</strong> Keynote: The role of vegetation in fluvial system dynamics (Perona P.)</td>
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<td><strong>VIDEO.</strong> Bioengineering measures of bank protection along Federal Waterways: the ecological potential for riverbank vegetation (Bornemann V.)</td>
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<td><strong>TALK.</strong> Nature-based engineering solution for sustainable invasive alien plants control and ecosystem restoration (Hoerbinger S.)</td>
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<td><strong>TALK.</strong> Soil bioengineering for riverbank protection, what benefits for biodiversity? (Evette A.)</td>
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<td><strong>TALK.</strong> River bio-engineering for bank protection in urban context: measured and perceived ecosystem services (François A.)</td>
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<td><strong>S7. PROTECTION FOREST MANAGEMENT</strong> (Chair: Berger F.)</td>
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<td><strong>VIDEO.</strong> Keynote: Prospectives of protective forest management in the Alps (Vacchiano G.)</td>
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<td><strong>VIDEO.</strong> Large trees protect small trees from the dislodging stress of landslides (Song M.)</td>
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<td><strong>VIDEO.</strong> Slow recovery from soil disturbance increases susceptibility of high elevation forests to landslides (Hongxi L.)</td>
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<td>16:35</td>
<td>Discussion Board</td>
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<td>18:00</td>
<td>Conference Dinner (at HAFL - Länggasse 85, 3052 Zollikofen)</td>
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**S5. HYDROPEDOLOGY AND VEGETATION (Chair: Rauch H.P.)**

- **11:10** **VIDEO.** Plant-soil interactions can enhance climate adaptation control technologies for urban spaces (Boldrin D.)
- **11:10** **VIDEO.** Is Soil-Water Bioengineering a Nature-Based Solution? A comparison of terms and definitions (Preti F.)
- **11:20** Discussion Board
- **11:30** Coffee Break
- **11:45** **VIDEO.** The turning resistance of trees in highly moist soil conditions (Fan C. C.)
- **11:55** **VIDEO.** Development of shrubby willows on a test levee and their impact on the seepage (Sokopp M.)

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**S6. RIVERBANK STABILITY AND VEGETATION (Chair: May D.)**

- **13:45** **TALK.** Keynote: The role of vegetation in fluvial system dynamics (Perona P.)
- **14:15** **VIDEO.** Bioengineering measures of bank protection along Federal Waterways: the ecological potential for riverbank vegetation (Bornemann V.)
- **14:30** **TALK.** Nature-based engineering solution for sustainable invasive alien plants control and ecosystem restoration (Hoerbinger S.)
- **14:40** Discussion Board
- **15:00** Coffee Break
- **15:15** **TALK.** Soil bioengineering for riverbank protection, what benefits for biodiversity? (Evette A.)
- **15:25** **TALK.** River bio-engineering for bank protection in urban context: measured and perceived ecosystem services (François A.)
- **15:35** Discussion Board
- **15:45** Coffee Break

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**S7. PROTECTION FOREST MANAGEMENT (Chair: Berger F.)**

- **16:00** **VIDEO.** Keynote: Prospectives of protective forest management in the Alps (Vacchiano G.)
- **16:15** **VIDEO.** Large trees protect small trees from the dislodging stress of landslides (Song M.)
- **16:25** **VIDEO.** Slow recovery from soil disturbance increases susceptibility of high elevation forests to landslides (Hongxi L.)
- **16:35** Discussion Board
- **18:00** Conference Dinner (at HAFL - Länggasse 85, 3052 Zollikofen)
**S8** _SOIL BIOENGINEERING AND TEMPORAL TECHNICAL CONSTRUCTION IN SLOPE STABILITY_  
(Chair: Bischetti G.B.)

- **9:00** **TALK** _Keynote:_ Design and temporal issues in Soil Bioengineering structures for the stabilisation of shallow soil movements (De Cesare G.)
- **9:30** **VIDEO** _Using forest trees as a bio-shield for debris flow mitigation: physical modelling (Himanshu K.)
- **9:40** **TALK** _A case study: Application of soil bioengineering techniques for gully stabilization in Jvarboseli / Tusheti National Park / Georgia (Rauch H.P.)
- **9:50** **TALK** _Overview of the degradation processes and causes of 223 soil bioengineering structures for riverbank protection (Leblois S.)

**10:00** Discussion Board

**10:25** Coffee Break

**S9** _SOIL BIOENGINEERING AND TEMPORAL TECHNICAL CONSTRUCTION IN RIVERBANK STABILITY_  
(Chair: Rauch H.P.)

- **10:40** **VIDEO** _Keynote:_ Soil Bioengineering and temporal technical construction in riverbank stability (Raymond P.)
- **11:10** **VIDEO** _Long-term riverbank soil bioengineering effectiveness monitoring in Calgary, Alberta Canada (Gallant M.)
- **11:25** Discussion Board

**11:35** Coffee Break

- **11:45** **TALK** _A database about river bioengineering techniques: building online map and first analyses (Jaymond D.)

- **11:55** **VIDEO** _Mechanical filtration stability of willow brush mattresses (Sokopp M.)

**12:05** Discussion Board

**12:15** Lunch Break

**13:45** **VIDEO** _Fluvial bioengineering in the Baztan-Arraioz river within the H2O Gurea project framework and the water bioengineering guidelines presentation (Sangalli P.)

**13:55** **VIDEO** _“Proteger”: a sustainable soil bioengineering project for riverbank protection in the Caribbean (Mira E.)

**14:05** Discussion Board

**14:15** Coffee Break

**S10** _BIO-ECONOMICS AND THE ROLE OF VEGETATION IN DISASTER RISK REDUCTION_  
(Chair: Dorren L.)

- **14:30** **VIDEO** _Keynote:_ Bioeconomic modeling: applications towards sustainable land use (Castro M.)

- **15:00** **VIDEO** _Specialization for the Soil and Water Bioengineering sector in the Mediterranean environment ECOMED Project (Sangalli P.)

**15:10** Discussion Board

**15:25** Coffee Break

- **15:40** **TALK** _Keynote:_ Towards quantitative evidence of Eco-DRR in mountains: a concise review (Moos C.)

- **16:10** **TALK** _Cost-benefit analysis of rockfall and landslide protection of railways by forests (Kühne K.)

**16:20** **VIDEO** _FAT: a decision support tool for risk management in the Alpine Space (Teich M.)

**16:30** Discussion Board

from 16:50 Vineyard Apero
Post-conference courses on model applications
(at BFH HAFL, Zollikofen)

25th JUNE

Post-conference courses are the moment where science meet practice! Choosing one of the courses, scientists and practitioners have the opportunity to discuss in detail the application of methods or tools for issues related to bioengineering measures:

- **SOSlope (D. Cohen)**, slope stability and vegetation (hillslope scale): SOSlope is a hydro-mechanical model of slope stability (depth< 2 m) that computes the factor of safety considering the mechanical forces due to roots and soil at the hillslope scale (Cohen and Schwarz, 2017).

- **Rockyfor3D (L. Dorren)**, rockfall and vegetation: Rockyfor3D is an application that explicitly and realistically integrates the barrier effect of trees on falling rocks.

Excursions

24th JUNE

Bioengineering and Torrent control measures: Canton of Fribourg and Bern (Schwarz M. & May D.)
Further information

New: The option to participate online in the scientific sessions (Monday to Wednesday) is introduced

Conference fee
Three day Conference: CHF 500 (late registration: 650) | Conference dinner: CHF 60 | Excursions: CHF 150 | Post-conference courses: CHF 250 (late registration: 350)

Online conference fee
CHF 250 (late registration: 350)

Registration
Please register at: www.ecorisgevents.com
(Early-bird registration closes: 30 April 2021)

Directions
Museum of natural history, Bernastrasse 15, 3005 Bern (Switzerland)
www.nmbe.ch/en/planning-your-visit

BFH-HAFL, Länggasse 85, 3052 Zollikofen (Bern, Switzerland)
https://www.bfh.ch/hafl/en/about-hafl/locations-facilities/

Contact
Niels Hollard - niels.hollard@bfh.ch or
Dr. Massimiliano Schwarz - massimiliano.schwarz@bfh.ch

Partner organisations