MesoHABSIM: Habitat model for river restoration planning

Date: June 19-22, 2018 - Location: Hydraulic Laboratory Obernach, TUM, Germany

MesoHABSIM Course Schedule

Day 1: Tuesday, 19 June 2018

Introduction and Data Collection

9:00 - 09:15 Welcome and logistics

9:15 - 10:30 Introduction to physical habitat models & MesoHABSIM
Teacher: Dr. P. Parasiewicz
Objective: Present the place of MesoHABSIM within the framework of habitat simulation models.
Topics:
- Physical habitat models
- MesoHABSIM approach
  * Survey techniques
  * Calculations
  * Results

10:30 – 11:00 Break

11:00 - 11:45 Biophysical templates
Teacher: Parasiewicz,
Objective: Introduction to ecological underpinnings and the concept of biophysical templates
Covered topics:
- Theory of Biophysical templates
- Biological targets and indicators
- Reference fauna
- Existing fish community
- Bioperiods
- Indicators

11:45 – 13:00 Biological filters
Teacher: P. Parasiewicz, P. Vezza
Objective: Demonstrate the process of creating biological filters
Covered topics:
- Literature based
- Empirical data
  - Sampling
  - Multivariate Suitability criteria
  - Random Forest
13:00 - 14:00  Break for lunch

14:00 – 15:00  Instream Habitat Classification
Teacher: Dr. P. Parasiewicz, J. N. Rogers, P.Vezza
Objective: Present the concept and procedures of classification
Covered topics:
- Spatial Delineation of river sites
- Assessment of physical attributes
  - Mapping surveys
  - Applying filters
  - Defining Suitable and Optimal habitat
  - Validation procedures

15:00 - 19:00  Visit to Field Site
Teachers: Dr. P. Parasiewicz, J. N. Rogers, P.Vezza
Objective: Demonstrate standard operating procedures of data collection for MesoHABSIM
Covered topics:
Field data collection (BYO Waders and suits)
Equipment demonstration
Grid Electrofishing
Snorkeling
Invertebrate and mussel sampling
Map hydromorphologic units (HMU),
Map high gradient streams
Measure water depth and velocity
Aerial photography with drones

Day 2: Wednesday, 20 June 2018

Habitat simulation and application
9:00 - 10:30  Lecture: Computation of suitability criteria
Teacher: Dr. P. Parasiewicz, P. Vezza
Objective: Present the procedures for analysis of model training data
Covered topics:
- Logistic regression and random forest model
- Compute logistic regression with or R
- Upscaling
  - Aggregation across the scales
  - Aggregation from species to community habitat
  - Community rating curves
  - Spatial aggregation
  - Temporal aggregation
- Biophysical Templates
  - Habitat deficit analysis
  - Restoration Simulation
10:30 – 11:00  **Break**

11:00 - 13:00  **Lecture: Habitat Time Series**  
**Teacher:** Dr. P. Parasiewicz  
**Objective:** Interpretation and Simulation  
**Covered topics:**  
- UCUT analysis  
- Flow management criteria

13:00 - 14:00  **Break for lunch**

14:00 - 15:00  **Lecture: Interpretation and Management Tools**  
**Teacher:** Dr. P. Parasiewicz  
**Objective:** Discuss Interpretation and Present Application  
**Covered topics:**  
- Identify habitat thresholds and management criteria  
- ACTograms  
- Restoration Scenario comparison  
- Integrative assessment

15:15 - 17:00  **Examples of MesoHABSIM application and SimStream08**  
**Covered topics:**  
- Examples of projects applying MesoHABSIM for river restoration.  
- High gradient streams  
- Regional application  
- Other possibilities

**End of two day course Part 1**

**Day 3: Thursday, 21 June 2018**

**Project Preparation**

9:00 - 10:15  **Project preparation**  
**Teacher:** J. N. Rogers, K. Suska  
**Objective:** Present the methods and procedures creating data foundation for MesoHABSIM analysis  
**Covered topics:**  
- Preparing drone survey  
- Gathering background data and establishing geo-database  
- Spatial delineation to Reaches, Sections and Representative Sites  
- Obtaining templates for mapping and fishing  
- Installing software
10:15 – 11:15  **Starting your Project**  
**Teacher:** J. N. Rogers  
**Objective:** Setting up the framework for your project and practical application of the software  
**Covered topics:**  
- Development of GeoDatabase  
- Adding data to GeoDatabase  
- Begin project  
- Setup basic attributes

11:15 - 11:30  **Break**

11:30 - 13:00  **Entering data into SIM-Stream software (standalone and QGis app)**  
**Teacher:** J. N. Rogers, P.Vezza  
**Covered topics:**  
- Database import  
- Import data from Excel  
- Manual input  
- Associations  
- Data validation

13:00 - 14:00  **Break for lunch**

14:15 - 15:30  **Part 2**  
**Teacher:** J. N. Rogers, P.Vezza  
**Objective:** Data entry and calculations continued  
**Covered topics:**  
- Entering available fish data  
- Import coefficients  
- Input coefficients cut-offs  
- Data QA&QC

15:30 – 15:45  **Break**

15:45 – 17:00  **Lab: Calculations continued**  
**Teacher:** J. N. Rogers  
**Objective:** SimStream calculations continued  
**Covered topics:**  
- Calculate Velocities  
- Calculate Suitabilities  
- Calculate Rating curves  
- Reports
Day 4: Friday, 22 June 2018

9:00 – 10:30  **GIS Lecture**  
  **Teacher:** J. N. Rogers, P. Vezza  
  **Objective:** Tutorial on Geodatabase export and Map production  
  **Covered topics:**  
  - Export Suitabilities to Geodatabase  
  - Create HMU maps  
  - Create Suitability Maps

10:30 – 11:00  **Break**

11:00 – 12:00  **GIS Lecture**  
  **Teacher:** Dr. P. Parasiewicz  
  **Objective:** Practical application of the software by students in analysis of training data  
  **Covered topics:**  
  - Adjusting templates  
  - Simulating Reference Conditions

12:00 – 13:00  **Lab Continued**  
  - Reference Rating curves  
  - Calculate Time series  
  - Calculate UCUTs  
  - Calculate Flows  
  - Flow management criteria

13:00 - 14:00  **Break for lunch**

  **Lab continued - Scenario Comparison**  
  - Simulate river restoration  
  - Compare rating curves  
  - Compare UCUTs  
  - Calculate Stress Days

15:30 - 16:00  **Break**

16:00 – 17:00  **Discussion of Results and Interpretation**  
  **Teacher:** Dr. P. Parasiewicz, J. Rogers, P. Vezza, K. Suska  
  **Objective:** Interactive Discussion  
  **Covered topics:**  
  - Discussion of Results  
  - New Developments

End of course