

<b>WPM 11 Human-Environmental Systems Interaction</b>			Credits: 6	
<b>Objectives</b> The students <ul style="list-style-type: none"> <li>- obtain basic knowledge of concepts, frameworks, theories and methods for conceptualizing and modeling human environmental systems (also called social-ecological systems)</li> <li>- get acquainted with institutions of sustainability</li> <li>- learn about land use modeling at different spatial scales</li> <li>- get a profound understanding of climate impact analysis and adaptation options in agriculture</li> </ul>				
Preconditions: none				
Teaching formats	SWS	Workload	Credits, prerequisite for exam	Contents
LE	2	90 hours	2	<ul style="list-style-type: none"> <li>- What is conceptualization? What is modeling?</li> <li>- Analysis of ecological systems (theories, models)</li> <li>- Resource economic approaches (theories, models)</li> <li>- Social-ecological systems (SES)</li> <li>- Framework for the analysis of sustainability of SES</li> <li>- Vulnerability/Resilience</li> <li>- The SES framework</li> <li>- Institutions of sustainability</li> <li>- Further methodological approaches to the study of SES (empirical field research, system dynamics, agent-based modeling, etc.)</li> <li>- Land use modeling approaches at different spatial scales</li> <li>- Linking economic models and biophysical models</li> <li>- Technological change, land expansion and international trade</li> <li>- Climate impacts and adaptation options in agriculture</li> <li>- Agricultural greenhouse gas emissions and mitigation options</li> <li>- The interaction between agriculture and the energy sector</li> <li>- Water and nutrients</li> </ul>
SE	2	90 hours	4	<ul style="list-style-type: none"> <li>- Presentations of students on selected topics</li> <li>- Practical exercises about the application of different frameworks and methods for the analysis of SES</li> <li>- Practical exercises in mathematical programming with GAMS</li> </ul>
Examination		180 hours	Pass	Oral Exam 30 minutes (50%), Precondition: presentation 20 minutes (50%)
Duration		<input checked="" type="checkbox"/> 1 Semester <input type="checkbox"/> 2 Semester		
Start of module		<input checked="" type="checkbox"/> WS (Block seminar) <input type="checkbox"/> SS		

