Water

People

Earth

Water and people in a changing world

WAT-E2090; Autumn 2022

Water & Development
Research Group

Content

Introduction
Thematic lecture
Break 10 min
Group discussion
Practicalities

Break 10-15 min

Hands-on training
Wrap up & intro to home assignment

Personnel

Matti Kummu – associate professor at WAT research group
(*practicalities, grading*)

Miina Porkka, Mika Jalava – postdoc, staff scientist at WAT research group
(*lectures, workshop & coding support*)

Sara Heikonen, et al
– phd candidate at WAT research group
(*hands-on training, coding support, workshops*)

Setting the scene…

Water

People

Earth

Group work: how to mitigate impacts on water and land?

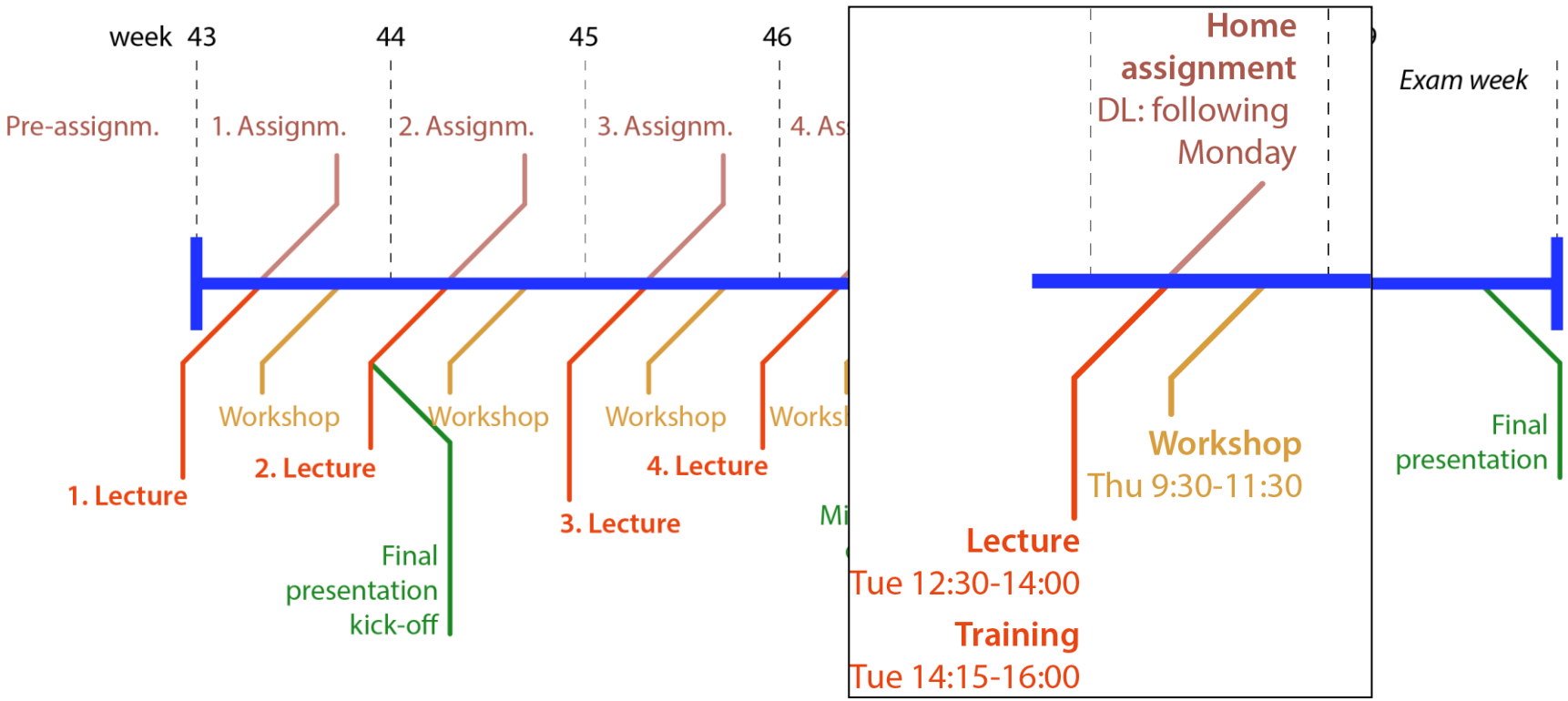
I collected the identified impacts to presemo, please:

1. Vote (individual): presemo.aalto.fi/wp22
2. Then discuss in small groups (3-4 people)
3. Share 2-3 main solutions & opportunities / group in Miro

5 min discussion

Intended learning outcomes

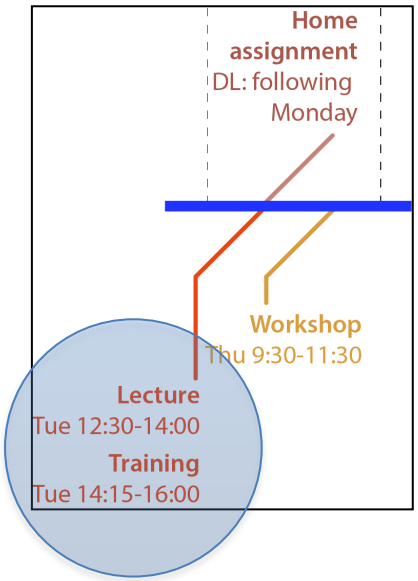
- *analyse and assess* how global water resources are distributed in relation to human population and how this has changed over time
- *recognise* the connection between food production and use of water
- *analyse* the water stress and water scarcity in various scales by using spatial datasets and estimate their impact on human society
- *apply R* on global water challenges
- *use* different kind of spatial datasets as a part of scientific research
- *recognise* the basics of visual scientific communication, and create informative maps and graphs



Course schedule

Water & Development Research Group

Lectures+hands-on

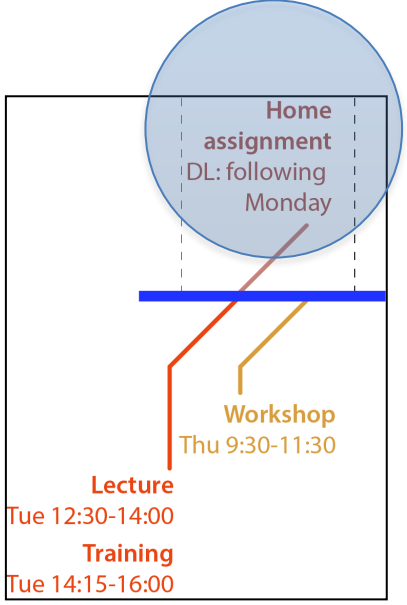


Contains normally following parts:

- Introduction (10 min)
- Discussion of home assignment (10 min)
- Motivation lecture to the theme (40 min)
- Break (5 min)
- Group work (30 min)
- Break (15 min)
- Hands-on research on day's theme (120 min; 10 min break after an hour or so)

Mandatory – to pass the course, you need to be present at least in 5/6 lectures

Optimally very interactive; learning together!



Home assignments

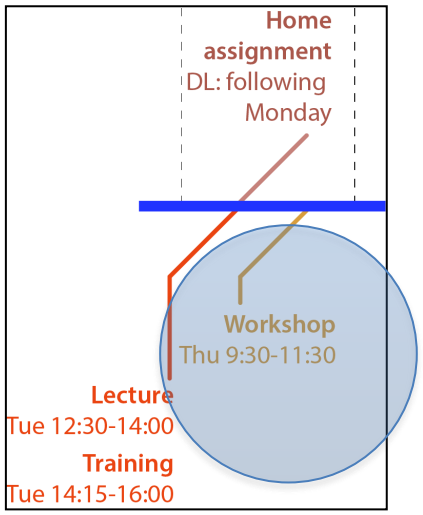
- Based on day's theme
- You have free hands to explore the theme
  - Aim to be research based assignment, i.e. you explore the most interesting parts of the theme for you
  - We'll give some example research questions to foster the work
- You will choose a large river basin in the world on which your home assignments and final presentation will focus
- *Feedback to each assignment on Wed*

Specs for home assignments

- Main emphasis on graphics and illustrations
- BUT do not forget short reflection and interpretation of results
- 1-page (strict!) poster type presentation
- DL Monday evenings – **if delayed, you'll get only 70% of the points** (if delayed over a week, no points at all)

Are you ok to share your home assignment with others after DL?

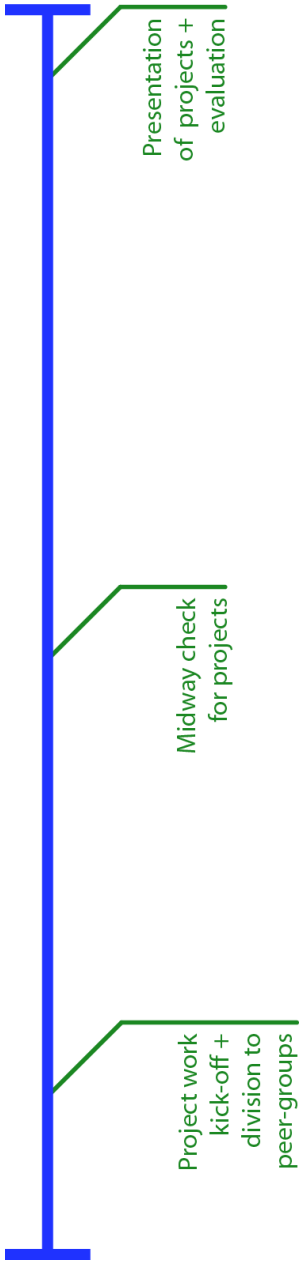
Workshops



- Starts normally with short lecture on Adobe Illustrator
- No fixed structure
- Teachers available for the whole time
- Aim to support your home assignments
- Discuss about the assignments with your peer-learners
- **Optional**, but *potentially very useful*

Monday helpdesks

- Mondays at 13:00 – 15:00 in Teams
- Extra help session for short, last-minute questions
- Teachers available online for the whole time
- **Optional, no attendance points**



Final presentation

- Each student will select a large river basin (*or other geographical area*) and make home assignments for that area
- At the final week, each gives a presentation of the area, related to the themes of the course
- Individual work, but supported by peer-learners
- **Builds on home assignments**
- Need to be presented to a small group at final week

Kick-off in the second week…

Content

Content – themes of each week

W1 Global water resources;
+ *Introduction to the course*

W2 Population dynamics;
+ *Kick-off of the final presentation*

W3 Land cover change and food production

W4 Water use

W5 Water scarcity

W6 Socio-economics of water and food

W7 *Presentations in small groups (~2-3 hrs)*
(*on Wed 7th of Dec*)

Content – methods and tools

- Each week we have specific
  - Thematic contents within the theme
  - Datasets and data types
  - R tools
  - Graph types
- Together these give a good understanding of the global water issues and give you a comprehensive set of spatial tools to work with in the future

Tools

- **R**

  + powerful for raster and vector calculations, easy to run analysis with multiple timesteps, relatively good reporting results, very easy to repeat calculations

  + open source - free

  – coding, take a while to learn the logic and basics

- **Adobe Illustrator**

  + great software to put the final touch on the graphs and maps

  – takes some effort to learn the basics

  – no license to own computer, you need to use over remote connection

  Alternatives for own computer:
  Affinity Designer (~60 eur), Inkscape (free)

Research-based learning

Course is largely based on research based learning, meaning:

- Information is not given ready chewed, but students will construct that themselves based on their findings – with the help of others and supported by teachers
- Close to scientific research –the **passion of discoverin**
- Foster ability
  it is often m
  what is the p

> "*If I had an hour to save the world, I would spend 59 minutes defining the problem and one minute finding solutions*." – Albert Einstein

Practicalities

Workload

Contact teaching (lecture-exercise sessions):	24h (6x4h)
Pre-assignment, orientation to lectures:	24h (6x4h)
Home assignments:	48h (6x8h)
Final presentation:	40h
TOTAL	**136h**

We aim to reduce the workload by:

- Motivating why these themes are important
- Providing 1 to 1 help with flexible hours
- Very applied assignments and final presentation (no need to learn by heart) + own research questions
- Giving supervision and instructions in weekly workshops
- Immediate feedback to each home assignment

Grading

	Criteria	Division of points	Max points
Lectures	Participation to contact teaching (*both lecture & hands-on training; 12:15-16:00*)	2 p / lecture 0.5 p / workshop (extra-points)	12 p (+3 p)
Home assignments	5 p if repeated what done in lecture with some reflection & interpretation of results *+ own research question* *+ innovative analysis* *+ beautiful illustration* *+ good reflection* *– no reflection / interpretation* *– no effort for illustration*	1-10 p / assignment *If submitted late, only 70% of the points will be given. If more than a week late, no points at all.*	60 p
Final presentation	• research questions • findings • illustrations • presentation (logic, structure, etc)	Peer-evaluation (8 p) Self-evaluation (8 p) Teacher evaluation (8 p)	24 p
Total			**96 p (+3 p)**

Grading thresholds:

1-50% of total points (i.e. 48p) **2**-60%(58p) **3**-70%(67p)
4-80%(77p) **5**-90%(86p)

Communication

- MyCourses -page
  - Course practicalities, schedule and links
  - Lecture material available after the lecture
  - Instructions for home assignments
  - Submission of home assignments & grades
  - Additional material
- Communicating
  - *Whole course (e.g. Q&A, etc)*: Teams
  - *Recorded lectures & hands-on training*: Teams
  - *Within the peers:* please work and communicate with your co-learners!

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