

Study manual Water Management in the Netherlands

Course code: AB_450085

Oktober 2020

ECTS: 6

Teachers:

- Dr. Toon Haer (Course coordinator, toon.haer@vu.nl)
- Dr. Sanne Muis (sanne.muis@vu.nl)
- Guest lecturer Dr. Jouke Velstra (Acacia Water)
- Guest lecturer Femke Schasfoort (Deltares)

Content:

- Online lectures and interactive assignments
- Self-study of reading material and assignments
- Homework
- Poster research, poster design, poster presentations

Exam material:

- Articles, books, reports
- Lectures and assignments
- Posters

Examination:

- Poster + poster presentation (35%)
- Canvas examination, proctoring via zoom, open and closed question (35%), essay question(s) (30%)

1. Aim of the course

The aim of the course is to: learn about the main characteristics of the hydrological system in the Netherlands, how water management and socio-economic activities have shaped the hydrological system, and how current water management and practices, climate change, and land use influence changes in the system. By the end of the course, students are able to:

1. Describe key characteristics of the Dutch hydrological system, and explain which physical and societal factors influence the hydrological system, both historically and in the future.
2. Evaluate and explain the impact of climate change on the Dutch hydrological system.
3. Explain the main principles of the Dutch water management, and its key topics and issues, but also to critically reflect upon the chosen strategies.
4. Reproduce the different components of the Delta Programme, and critically reflect upon the rationale behind the adaptation strategies and the trade-offs between adaptation decisions.
5. Review the scientific literature in order to investigate a key issue related to water management in the Netherlands, and present the main findings in a poster presentation.

During the lectures different topics will be discussed by the teachers and by guest lectures. Using Canvas, the students will form groups of three persons for group assignments. These groups assignment include (1) interactive assessments during the lectures, where each group will investigate how the topic of the lecture applies to a selected waterboard and (2) a poster assignment, where each group will design a poster on a self-chosen subject regarding Water Management in the Netherlands. The poster subject needs to be approved before the 12th of November by the teachers, for which a discussion board will be opened on Canvas. On the 4th of December, there is a poster session where each group will present their poster to their fellow students.

Activities

This is a 6 EC course which is equal to 168 hours of study. The next page shows the timetable for this course, including the involved teachers, and the subject. It also shows which activities should be done in preparation for each lecture. The content discussed during the lectures and assignments are part of the exam material, and attendance is therefore highly recommended. The scheme also shows the required time spend in (~35 hours) and outside of class (~98 hours of study, ~35 hours on the poster).

Activities during class

Activities before class

		<ul style="list-style-type: none"> - Read the course manual (~30 minutes) - Read Chapter 5 of Vos (2015) <i>Origin of the Dutch Coastal Landscape: synthesis</i> (~1.5 hours) - Read Chapter 1 <i>The development of water management in the Netherlands</i> of RWS (2019) <i>Watermanagement in the Netherlands</i>: (~30 minutes) - Think on what you expect to learn during the course, we will discuss this during the first lecture. (~30 minutes)
Session 1: Introduction and history of water management Tuesday 27-10, 13:30 – 17:30, online <ul style="list-style-type: none"> • Lecture: Introduction to the course (~30 minutes) • Lecture: History of water management (~45 minutes) • Interactive assignment, breakout rooms (~30 minutes) • Assignment discussion (~15 minutes) 	Toon Haer	
		<ul style="list-style-type: none"> - Read Chapter 2 and Chapter 3 (3.1 to 3.5) of Water in the Netherlands and contribute to the Discussion Page (~2 hours) - Explore potential topics for the poster (~1 hours)
Session 2: Water system – Climate and Hydrology Thursday 29-10, 13:00 – 15:30, online <ul style="list-style-type: none"> • Lecture: Climate and hydrology (~60 minutes) • Interactive assignment, breakout rooms (~30 minutes) • Assignment discussion (~15 minutes) 	Sanne Muis	
		<ul style="list-style-type: none"> - Read KNMI (2014): KNMI'14: Climate Change scenarios for the 21st Century – A Netherlands perspective (~2 hours); - Contribute to the discussion page and make a water balance for the Netherlands (~2 hours) - Explore potential topics for the poster (~1 hours)
Session 3: Water system – Hydrological impact of climate change Tuesday 3-11, 13:30 – 17:30, online <ul style="list-style-type: none"> • Lecture: Hydrological impact of climate change (~60 minutes) • Interactive assignment, breakout rooms (~30 minutes) • Assignment discussion (~15 minutes) 	Sanne Muis	
		<ul style="list-style-type: none"> - Read Chapter 2 <i>water systems and their function</i> of RWS (2019)

		<p><i>Watermanagement in the Netherlands</i> (~20 minutes)</p> <ul style="list-style-type: none"> - De Vries, J.J. (2007). Groundwater, Geology of the Netherlands. KNAW and contribute to the discussion page and calculate groundwater flow (~2 hr) - Explore potential topics for the poster (~1 hours)
<p>Session 4: Water system – Main hydrological processes Thursday 5-11, 13:00 – 15:30, online</p> <ul style="list-style-type: none"> • Lecture: Main hydrological processes (~60 minutes) • Interactive assignment, breakout rooms (~30 minutes) • Assignment discussion (~15 minutes) 	Sanne Muis	
		<ul style="list-style-type: none"> - Read chapter 3 <i>water safety</i> of RWS (2019) <i>Watermanagement in the Netherlands</i> (~20 minutes) - Read Chapter 3 Bergsma (2017) <i>From flood safety to risk management - The political genealogy of the Zuiderzee Works: The establishment of a safety discourse</i> (~2 hours) - Read Van Alphen (2020) <i>Room for the River: Innovation, or Tradition? The Case of the Noordwaard</i> (~1 hour) - Prepare for class with the assignment on Canvas (~40 minutes) - Submit the first idea for your poster topic! (~4 hours)
<p>Session 5: Water safety Tuesday 10-11, 13:30 – 17:30, online</p> <ul style="list-style-type: none"> • Lecture: Water safety (~60 minutes) • Interactive assignment, breakout rooms (~30 minutes) • Assignment discussion (~15 minutes) 	Toon Haer	
		<ul style="list-style-type: none"> - Read chapter 6 <i>Salinization</i> of RWS (2019) <i>Watermanagement in the Netherlands: water salinization</i> (~20 minutes) - Go to the website www.spaarwater.com and based on the information on the website post discussion questions for Jouke Velstra on canvas. (~2 hours) - Contribute to the discussion page on canvas with questions for Jouke Velstra (~40 minutes) - Adjust your idea for your poster topic based on feedback (~4 hours)
<p>Session 6: Salinization Thursday 12-11, 13:00 – 15:30, online</p> <ul style="list-style-type: none"> • Guest lecture: Salinization (~60 minutes) • Interactive assignment, breakout rooms (~30 minutes) 	Jouke Velstra	

• Assignment discussion (~15 minutes)		
		- Work on poster (~3 hours)
Session 7: excursion is cancelled. Alternative to be determined Tuesday 17-11, 9:00-17:00	Toon Haer, Sanne Muis	
		<ul style="list-style-type: none"> - Read chapter 7 <i>Water quality</i> of RWS (2019) <i>Watermanagement in the Netherlands</i> (~20 minutes) - Read <i>River basin management plans 2016-2021 of the Netherlands</i> (~2 hours) - Read Puijenbroek et al. (2014) <i>Dutch metrics waterframework directive</i> (~1 hour) - Prepare for class with the assignment on Canvas (~ 40 minutes) - Work on poster (~4 hours)
Session 8: Water quality Thursday 19-11, 13:00 – 15:30, online <ul style="list-style-type: none"> • Lecture: Water quality (~60 minutes) • Interactive assignment, breakout rooms (~30 minutes) • Assignment discussion (~15 minutes) 	Toon Haer	
		<ul style="list-style-type: none"> - Read page 14-45 of Havekes et al. (2017) <i>Water governance – Dutch water authority model</i> (~2.5 hours) - Prepare for class with the assignment on Canvas (~30 minutes) - Work on poster (~4 hours)
Session 9: Water governance Tuesday 24-11, 14:00-15:45, online <ul style="list-style-type: none"> • Lecture: <i>Water governance and waterboards</i> (~60 minutes) 	Toon Haer	
		<ul style="list-style-type: none"> - Read chapter 8 <i>Future developments</i> of RWS (2019) <i>Watermanagement in the Netherlands</i> (~20 minutes) - Read chapter 9 <i>Towards a water-management policy that can address climate change</i> of RWS (2019) <i>Watermanagement in the Netherlands</i> (~20 minutes) - Read Deltaprogramme 2015, pages 1-41 (~3 hours) - Prepare for class with the assignment on Canvas (~20 minutes) - Work on poster (~4 hours)
Session 10: Deltaprogramme (DP) – history and water safety Thursday 26-11, 13:00 – 15:30, online <ul style="list-style-type: none"> • Lecture: History of the deltaprogramme (~30 minutes) 	Toon Haer	

<ul style="list-style-type: none"> Lecture: DP water safety (~30 minutes) Interactive assignment, breakout rooms (~30 minutes) Assignment discussion (~15 minutes) 		
		<ul style="list-style-type: none"> Read Deltaprogramme 2021, page 15-83 but not paragraph 3.5, 4.5 and 5.5 (~3.5 hours) Prepare for class with the assignment on Canvas (~30 minutes) Work on poster (~4 hours)
Session 11: Deltaprogramme (DP) – freshwater and adaptation Thursday 3-12, 13:00 – 15:30, online <ul style="list-style-type: none"> Lecture: DP freshwater (~30 minutes) Lecture: DP spatial adaptation (~30 minutes) Interactive assignment, breakout rooms (~30 minutes) Assignment discussion (~15 minutes) 	Toon Haer	
		<ul style="list-style-type: none"> Submit poster
Session 12: Poster session Friday 4-12, 9:00-17:00	Toon Haer, Sanne Muis	
		<ul style="list-style-type: none"> Read chapter 5 <i>Water shortages and droughts</i> of RWS (2019) <i>Watermanagement in the Netherlands</i> (~20 minutes) Read van Duinen et al. (2015) Coping with drought risk: empirical analysis of farmers' drought adaptation in the south-west Netherlands (~2 hours) Prepare for class with the assignment on Canvas (~40 minutes)
Session 13: Drought Thursday 10-12, 13:00 – 15:30, online <ul style="list-style-type: none"> Lecture: drought - general (~15 minutes) Guest lecture: drought application in practice (~60 minutes) Interactive assignment, breakout rooms (~60 minutes) Assignment discussion (~15 minutes) 	Femke Schasfoort	
		<ul style="list-style-type: none"> Prepare for exam
Exam Thursday 17-12, 8:30 – 11:30, online <ul style="list-style-type: none"> Open & closed questions and essay questions Detailed instructions on the exam will be posted on Canvas 		

2. Literature

The table below shows the mandatory literature for this course. This literature is part of the exam material. All literature will be provided on Canvas. The lecture slides provide additional information and are also part of the exam material. Slides will be available on Canvas.

Subject	Mandatory reading
General	<ul style="list-style-type: none">• Chapters 1-9 of 'Watermanagement in the Netherlands'• Page 14-45 Havekes et al. (2017) Water governance – Dutch water authority model
History of water management	<ul style="list-style-type: none">• Chapter 5 synthesis of Vos (2015) Origin of the Dutch Coastal Landschape
Climate and hydrology, and impact of climate change	<ul style="list-style-type: none">• KNMI Report '14• Chapter 2 and 3 (3.1 to 3.5) in Water in the Netherlands (1998), NHV.
Main hydrological processes	<ul style="list-style-type: none">• De Vries, J.J. (2007). Groundwater, Geology of the Netherlands. KNAW.
Water safety	<ul style="list-style-type: none">• Chapter 3 Bergsma (2017) From flood safety to risk management - The political genealogy of the Zuiderzee Works: The establishment of a safety discourse• Van Alphen (2020) Room for the River: Innovation, or Tradition? The Case of the Noordwaard
Salinization	<ul style="list-style-type: none">• Chapter 6 <i>Watermanagement in the Netherlands: water salinization</i>
Water quality	<ul style="list-style-type: none">• Puijenbroek et al. (2014) <i>Dutch metrics waterframework directive</i>• River basin management plans 2016-2021 of the Netherland
Deltaprogramme	<ul style="list-style-type: none">• Deltaprogramme 2015, pages 1-41• Deltaprogramme 2021, page 15-83 but not paragraph 3.5, 4.5 and 5.5
Drought	<ul style="list-style-type: none">• Van Duinen et al. (2015) Coping with drought risk: empirical analysis of farmers' drought adaptation in the south-west Netherlands

3. Examination

The final grade is based on the poster research, poster design and poster presentation (35%), and an online examination via Canvas and Zoom with one part open and closed questions (35%) and one part essay questions (30%). To pass the course, you need minimum grade of 5.5 for the poster. The posters will be graded by both the teachers and the fellow students. The exam needs to be 5.5 on average with a minimum grade of 5 for each part. It is possible to do a resit for the individual parts. Note that students are required to have a functioning camera, otherwise it is not possible to participate in the exam. More detailed instructions on the exam will follow during class and on Canvas.

4. Grading rubric for the poster presentation

The poster will be graded based on several aspects. The table below provides a description of the criteria of the grading of each aspect. The rubric will be used to grade the poster research, poster design and the presentation. We recommend using the rubric when preparing for the poster session.

Grading criteria for the poster

Criteria \ grade	>7.5	7.5-5.5	5.5>
<i>Content of poster and presentation</i>	Goes beyond replicating available information. New connections are made between different sources. There are 5 sources, of which at least 3 scientific papers.	New knowledge is presented, but insufficiently based on good-quality sources.	The presented research is insufficient for a 3th year course. The content does not show that the student has deep knowledge of the subject, and/or the research is based on a single report or paper.
	The problem statement, main research question, and methods are clear and concise, the conclusion is clear without much further explanation.	The problem statement, main research question, and methods are mostly clear and concise, but require further explanation and/or the conclusions are not completely clear without further explanation.	The problem statement, main research question, and methods are mostly unclear, not well presented and/or the conclusions are unclear.
	There is a clear motivation for the subject and presented research, and the content is accurate.	The motivation for the subject is unclear, and/or the content contains small errors.	There is no motivation for the choice of subject, and the contain contains major errors.
	There is a good balance between text and figures, tables, maps. The figures, tables, and maps are useful and referenced from the text.	There is slight misbalance between text and figures, tables, maps. The figures, tables, and maps are useful and referenced from the text.	There either too much text or too much figures, tables, maps. Not all figures, tables, and maps are useful and/or referenced in the text.
<i>Presentation style</i>	The information on the poster and during presentation is clear and understandable for peers. The presentation is presented attractively and convincingly.	The information on the poster and during the presentation is mostly clear and understandable for peers. ,but it contains too complex information or too simple information, and/or the presentation is not convincing and/or attractive.	The information on the poster and during the presentation is either too simple or too complex, and it is not presentation is unconvincing.
<i>Answering questions</i>	The questions are well-interpreted, and the answers are short, concise, correct, and complete.	Most questions are well-interpreted, and most answers are complete.	Most questions were not understood, and the answers were incomplete or incorrect.
<i>Cleanness and attractiveness of the poster</i>	All information on the poster is readable during the online presentation, for instance by zooming in.	Most information on the poster was readable during the online presentation.	The information was not readable during the online presentation.
	All figures, tables, and maps are readable and can be interpreted stand-alone from the text. Sources are referenced.	Most figures, tables, and maps are readable and can be interpreted stand-alone from the text. Sources are referenced.	Most figures, tables and maps are unclear and cannot be interpreted by themselves. Sources are missing.
	The poster attracts positive attention through the design, title, layout, and figures	The poster is might attract your attention through the design, title, layout, and figures.	The poster does <u>not</u> attract positive attention through the design, title, layout, and figures.