

Water and agricultural landscapes (2 units)

Integration module (Stream no.2: Water, land and people)

Course description

This unit will commence with a world perspective on water, population growth and food security within the context of water redistribution in landscapes of different climatic regions. Meeting future needs for food requires highly efficient systems in both irrigated and dryland agriculture, which are demonstrated to be part of an integrated catchment management issue and at the same time consider the associated water footprint and ecosystem services.

As agriculture is just one of many land uses for catchments, the interdependence to other land uses and their combined impact on ecosystem functionality will be addressed in this unit. Interactive models will be used to assess the impacts of management decisions on water quality and farm productivity within a catchment or river basin context.

Key topics include: population growth, food demand, role of agriculture, agriculture in a catchment context, water and agriculture, agriculture and ecosystems functions.

Course introduction

Students will develop an understanding of how land use relates to the water cycle with case studies on agricultural systems and principles of sustainable management from farm to catchment scales. They will be able to converse with agriculturalists as informed water managers. Principles of efficient irrigation water use and conservation of water in dryland systems will be emphasised. Intensification of land use has led to degradation of affected ecosystems, and this unit will introduce students to remediation techniques to counter land and water degradation through better management. An understanding of agricultural water management and methods of environmental protection will prepare students for problem-based learning (PBL) exercises in catchment management. Interactive models will be used to assess the impacts of management decisions on water quality and farm productivity within a catchment context.





IWC Graduates receive a co-badged degree from four leading Australian universities, ranked amongst the top 1% of the best universities in the world for teaching and research. (QS Global Ranking)

Risk-based decision making of water management will be embedded into the module with an emphasis on linking management to governance mechanisms. Alternative water use and peri-urban encroachment on agricultural land use will be examined.

Course delivery

- **Full-time** (on-campus) students, including international students, will be required to attend a two-week, Perth-based teaching block in 2012, including four days of field work.
- **Part-time** (external) students will be required to take this course as a summer semester elective to be taken either at the end of their first or second year of coursework.

Assumed background

The following modules are pre-requisites for this course: WATR7000, WATR7001, WATR7002 and WATR7003.

Learning objectives

After successfully completing this course students should be able to:

- have an understanding of global trends for population growth, climate change, water demand and food security;
- understand key directions in water management to support sustainable agriculture;
- understand the different models of agricultural production in rainfed and irrigated systems and their impacts on water, water-dependent ecosystems and society;
- have an overview of innovative solutions for efficient and effective use of water and land resources for different agricultural systems;
- understand the context of water redistribution in landscapes of different climate regions and its impact on agricultural practices;
- achieve a comprehensive view of the harmonisation of economic, social and ecological dimensions of agriculture.

Teaching staff

Course Coordinator: [Dr Steven Pratt](#) (The University of Queensland)

Lead Lecturer: [Prof Neil Coles](#) (The University of Western Australia)

Lecturer: [Prof Jeff Camkin](#) (The University of Western Australia)

Problem-Based Learning (PBL) projects

Parallel PBL projects and field trips will run through the semester, comprising roughly 50% of the total contact time and assessment weight for the Integration semester. These enable students to develop skills that complement the content delivered in the four co-requisite courses: WATR7100, WATR7200, WATR7300, WATR7400. Please see other co-requisite course profiles to cross-reference.

The PBL stream for the Integration semester comprises an individual project and a group project conducted in multidisciplinary teams:

- **PBL3:** Development of an implementation plan for increasing water recycling in the lower Great Southern (Group project)
- **PBL4:** Critical assessment of Australian integrated water management learnings and application in a developing country context (Individual project)

Field trips

Students begin the Integration semester with a two-week field trip to [The University of Western Australia's Centre of Excellence in Natural Resource Management in Albany](#), south Western Australia. The cost of the trip is covered in course fees.

As part of this module (Water and agricultural landscapes), students also undertake either:

- a four-day field trip to rural areas of Western Australia (for full-time students)
- a two-day field trip to rural areas of Western Australia (for part-time students)

For a complete list of field trips that students undertake during the program, please refer back to "Field trips" on page 4 of this syllabus or visit [IWC website](#).

