# AMBER MEETS IRIS

## The importance of remote sensing from Sentinel missions for monitoring and managing our river systems

**24th September 2018**

**Aula Castigliano, Politecnico di Milano**
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Rivers rank among some of the most threatened ecosystems in the world and are the focus of costly restoration and management programmes targeted to improve river conditions and to ensure the essential functions and services that rivers provide to our society. The scope of this workshop is to discuss recent advances in river management and monitoring strategies, by combining results from two projects lead by the Natural Research Management (NRM) group of the Politecnico di Milano: AMBER and IRIS. AMBER (Adaptive Management of Barriers in European Rivers) is a H2020 project which explores adaptive management to the operation of dams and barriers in European rivers. The project aims to achieve a more efficient restoration of stream connectivity, and to address impacts caused by river fragmentation adopting emerging technologies in remote sensing, numerical models and other fields. The IRIS (Italian Research and development Initiative for Spaceborne river monitoring) project aims at developing tools for monitoring medium-large river systems from remote sensing combining drones, traditional field techniques and satellite data from the Sentinel missions of the Copernicus program. IRIS is funded by the Italian Environmental Agency (ISPRA) under the umbrella of the ASI-ISPRA initiative "Habitat Mapping".

*Kirstie Fryirs*, Professor of fluvial geomorphology at the Macquarie University (Sydney, Australia), will open the workshop, bringing us examples of the consolidated experiences she and her research group have developed over the last decade in Australia and New Zealand in the field of fundamental and applied fluvial geomorphology.

## PROGRAMME

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| 10:00-10:10 | **Introduction and welcome**<br>*C.M. Prati (Dipartimento di Elettronica Informazione e Bioingegneria, POLIMI)* |
| **10:10-10:50** | **KEYNOTE TALK - Do we still need a human? Geomorphic analysis and interpretation of river systems in an age of emerging technology and big data**<br>***K. Fryirs (Macquarie University, Australia)*** |
| 10:50-11:10 | Managing river barriers and sediments at the European scale: the H2020 AMBER project and beyond<br>*B. Belletti, S. Bizzi (DEIB - Politecnico di Milano, Italy)* |
| 11:10-11:30 | BREAK |
| 11:30-11:50 | Why IRIS? Opportunities and challenges by RS technology for the implementation of the IDRAIM framework<br>*M. Bussettini (ISPRA, Roma, Italy)* |
| 11:50-12:10 | Italian Research and development Initiative for Spaceborne river monitoring (IRIS) in the framework of the ASI-ISPRA project "Habitat Mapping"<br>*S. Mariani (ISPRA, Roma; Italy)* |
| 12:10-12:30 | Italian National plan for environmental operational services<br>*A. Taramelli (IUSS Pavia; ISPRA, Roma, Italy)* |
| 12:30-12:50 | Assess success of restoration measures by means of Remote sensing techniques<br>*F. Comiti (Libera Università di Bolzano, Italy)* |
| 12:50-13:20 | ROUND TABLE |
| 14:45-17.30 | The Fluvial System afternoon: contributions from young Italian river scientists (program soon available) |

**KEYNOTE TALK**

**Do we still need a human? Geomorphic analysis and interpretation of river systems in an age of emerging technology and big data.**

*Professor Kirstie Fryirs - Department of Environmental Sciences, Macquarie University, Sydney, Australia*

Emerging technologies and big data open up opportunities for landscape and river analysis like never before. With the emergence of new technologies that can generate big data, and the use of that data to make environmental management decisions, it is timely to reflect on whether a human is still need to undertake such analyses? The answer is yes!
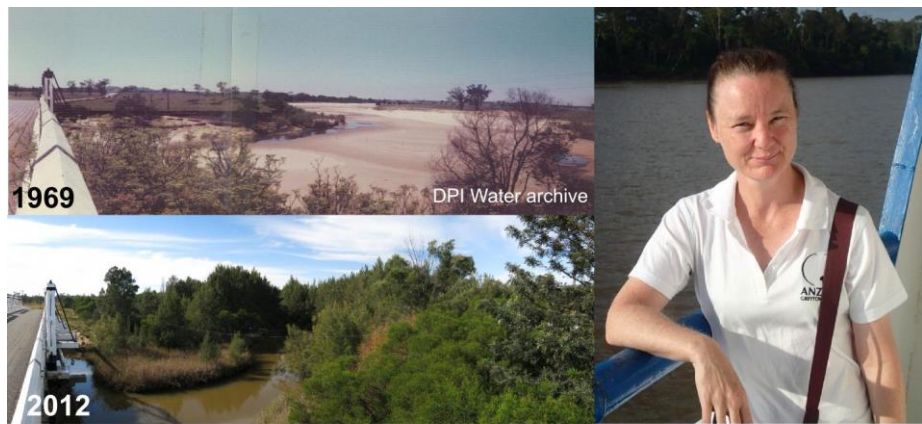
We still need humans to:

1) have the conceptual grounding and training to ask questions of scientific and management significance,

2) select the right tool for the job,

3) collect the right data using the technology available (or decide to use traditional methods where needed),

4) interrogate and interpret the output,

5) verify the output in the field (make sure it's real), and

6) make well-informed river management decisions that are place-based.

In this presentation I will use the case study of the River Styles Framework as a coherent, scaffolded geomorphic approach to analysis of river types, condition and recovery potential, and discuss where opportunities lie for emerging technology and tools to be 'plugged in' to the process. I will also discuss where the technology is not yet good enough to replace the human! I will use the roll-out and application of the Framework across NSW, Australia (2.7 x the area of Italy) to demonstrate how geomorphic analysis of river systems is used in river management planning and prioritisation.

**Biography**

**Kirstie's** research focuses on fluvial geomorphology, in particular river evolution, sediment budgets and landscape (dis)connectivity, and human disturbance to rivers. She has developed frameworks for assessing the physical condition and recovery potential of river systems. She is co-developer of the River Styles Framework and a portfolio of professional development short courses. She works closely with federal and state government and industry on river management planning, policy and decision-making, and the use of geomorphology in the process. She has also undertaken research on heavy metal contamination at Casey and Wilkes stations in Antarctica. She is the author of over 100 scientific papers and has co-written or edited three books titled "Geomorphology and River Management", "River Futures" and "Geomorphic Analysis of River Systems: An Approach to Reading the landscape". Kirstie is the winner of the Gordon Warwick medal for excellence in research.