

GEOMORPHOLOGY OF THE ORD RIVER

On 6 March 2002 Peter Sandercock spoke about the Upper Ord River Catchment and Lisa Cluett spoke about on-going changes to the Lower Ord River. Both speakers are Ph.D researchers in Geography at the University of Western Australia.

Peter, who spoke first, said that there had been many changes to Upper Ord Catchment in the last 120 years. Cattle and donkey grazing had especially affected the rate of erosion, and the construction of the dam has had an impact. The Upper Ord catchment extends to Halls Creek and into the Northern Territory, but most of his work relates to 10,000 sq kilometres of severely eroded land extending upstream from Lake Argyle. In the 1960s much of this land was quite bare of vegetation and extremely erodible. Concern about the threat to the viability of the Dam induced the Government to designate this area a Water Catchment Reserve and remove all people and stock.

The geology of the catchment is diverse, but the main factors leading to changes were:

1. The tropical monsoonal climate
2. The large proportion of the catchment which consists of very erodible lithologies
3. A flashy discharge due to high rates of precipitation

The study area was divided into four zones:

1. Ord - Panton River
2. Ord R Forest
3. Ord - Negri River
4. Ord R - Lake Argyle.

The Aims of his research were:

1. To characterise channel reaches and distribution of major sediment bodies
2. Channel adjustments and changes in sediment storage
3. Develop an understanding of the nature of river channels

Peter then went on to show slides. In the upper reaches the river bed is sandy. This changes to more gravel at the junction with the Panton River. Meanders over the flood plain are controlled by bedrock. The channel bed is slowly degrading with time. Fieldwork is done after big events.

In the eroded zones the alluvial flood plain was devoid of vegetation after the 1950s and 60s. Revegetation was started in the 1970s with varying success. Peter showed some startling pictures of the extent of gully erosion but said that gullies had always been there. Rates of deposition can be used to indicate rates of erosion.

In the Ord – Lake Argyle Zone, backwater from the lake together with increased vegetation causes deposition to occur in the river.

Questions followed. The sediment stored upstream from Lake Argyle is considerable so it doesn't all end up in the lake, which is good news. Sediment depths of up to 14 metres have been measured. Alex Forrest's journals were used to describe the original condition of the catchment.

The President thanked Peter for his presentation. Then it was Lisa's turn. She spoke about the on-going changes to the lower Ord River downstream from the Diversion Weir to the Gulf of Carpentaria, including the important role of plants in the channels.

Changes to the channels since the dam was constructed are not fully understood. There are multiple water users including irrigators, hydro-electric power and tourists.

Her research aims to document channel change and factors that might influence such change.

Factors to be considered are listed under a number of headings:

1. Boundaries - includes
 - Local environment and
 - Historical channel data.
2. Current System - includes
 - Dam construction,
 - Sediment interactions and
 - Flood events.
3. Future change – includes
 - Where and how and
 - Environmental flows.

The study of Sediment interactions includes the effects of unregulated tributaries, cattle grazing, channel bedrock e.g. basalt outcrops, rapids and most importantly, vegetation.

Vegetation changes have been widespread and have been due to the

1. Change in the flow regime
2. Complex interactions with sediments
3. A range of ways plants affect interactions

Photographs illustrated stages of mid channel bar formation and stabilisation depending on vegetation getting a foothold, maturing and expanding and also how the river banks were able to resist erosion with stands of mature vegetation.

Lisa went on to show her model of the ecosystem on an idealised cross section of the Ord channel which she has divided into six vegetation zones. She has mapped these zones onto a plan of the lower Ord. The zones are:

1. Submerged aquatics
2. Floating emergents
3. Anchored emergents
4. Wet riparian
5. Dry riparian and
6. Abandoned i.e. Zone of flood plain no longer subjected to flooding.

When vegetation begins to change this will be documented together with the associated morphological changes to the river. Changes are slow but the vegetation is the indicator to the change.

Finally, in answer to a question, Lisa said weed infestations such as Cumbudgee (Typha) and Salvinia are problems.

Lisa would love to hear from anyone who has historical photos (before 1970) of the lower Ord River to help her determine how and where the River has changed. She can copy any photos and slides you might like to lend and will acknowledge their owners if she uses them in her thesis.

Daphne Choules Edinger & Gilbert Marsh