

River Managers - Research for the Environment – Draft Research topics

(an outline of some possible research topics related to rivers)

The modelling and flood hazard mapping for all the main river systems in the region and nation.

Keeping the techniques used for modelling and mapping the flood hazards in the river systems both up to date (start of the art) and also consistent nationally.

Understanding the past present and future geomorphology and sediment transport in our major river systems.

This is critical to be able to manage the gravel resource where it is being extracted, and also planning works in the river which can be made redundant by significant accretion and degradation. There is a basic planning requirement to know what is likely to happen in a watercourse for a given period of time. Also recognising where watercourses behave or exhibit certain characteristics is essential in the hydraulic engineering design and management of the river systems.

Understanding how the effects of climate change and development will impact on the natural geomorphological and sediments transport behaviour of these river systems.

The effects of the increase in rainfall due to climate change and the implication this will have for the future sedimentation and geomorphology in our river systems.

Understanding the impacts of the vegetative cover and development on run-off characteristics in catchments and these effects on river flows.

This is crucial when looking at the possible future land uses in the catchments, and the effects this has not only on the total river flows and sediment transport but also the implications for behaviour under flood conditions.

Understanding how the change in catchment run-off characteristics have on the geomorphology and sediment transport in the river systems.

This again is crucial, as there is a real need to identify that rivers are integrated systems and that future sedimentation or erosion problems can be managed by identifying the effects of variability in the run-off in the catchment.

Developing a set of stage damage curves for estimating flood damage from depth of inundation for residential properties.

Creating or adopting an appropriate standard set of flood damage curves would enable local and regional authorities to compare and contrast the suitability of flood protection

measures being put in place and also give the ability for central government to identify where funding holes may be located on a national basis.

Looking at the economics being able contrast the impacts of zoning of flood prone land on urban growth and development.

This could form a effective tool when convincing local authorities of the economic benefits from suitable identification and avoidance of hazards. It is often sited that having to accommodate a hazard in a community is a onerous burden on the ability for it to grow and develop

The Impact of the Sea Level Rise on river outlets and dynamics of the coastal section of the river systems which discharge into the sea.

The coastal interfaces of some of our river systems are incredibly important with implications for the future productivity of large areas of land at stake. The dramatic changes in mean sea level predicted for the next 50-100 years are going to completely transform the dynamics of some of these estuaries and river mouths.

Ecological Investigation into habitat requirements for native fish in comparison to the river management techniques.

There has been considerable debate about the effects of some of the river channel management techniques in current use on our native fish species. There is very little qualitative data available to make evaluations of whether this is correct or not

Research into hybrid native plant species to see if we can develop a plant which as useful for erosion protection as the

There can be significant resistance to the use of willows for erosion protection in river systems in New Zealand. It should be noted that willows provide erosion protection of an order of magnitude greater than native plant species. The questions has been raised why can't we develop native species to be as effective as willows.