

PROBLEM CARD: 11 FLOODPLAIN MANAGEMENT



You have no doubt seen footage of what can result when flash floods hit our towns and cities. Strong rains and blocked drains can happen anywhere, but towns built in low areas, near seas or near waterways may be more prone to flooding—and the damage from floods in these places can become catastrophic.

Waterways engineers are in charge of understanding flooding in the area and what that means to the protection of buildings, roads and bridges. They have a big job ahead of them as a changing climate is causing flooding patterns to become unpredictable.

WARRNAMBOOL WATERWAY WOES



Warrnambool Victoria is a flood prone area because of its location between the coast and a river. The image above we can see where flooding is likely to occur in the township of Warrnambool. The biggest flood ever recorded was in 1946 – known as the Big Flood when waters rose to over 8 metres.

The Glenelg Hopkins Catchment Management Authority is the government body assigned to looking after waterways in the district and play an important role in preparing for flooding.

Maybe there is a design structure that could protect homes from flooding? Or possibly a material that can make a house stronger? Some developments push water away from infrastructure and into other areas – has this happened here?



Why build near water?

Many towns were settled along waterway in order to provide easily accessible freshwater for residents and livestock as well as fertile land. What early settlers did not realise is that that fertile land was due to repeated flooding events.

Floods happen when water falls as rain somewhere in the catchment, usually in hilly areas. In hilly areas the water flows down creeks and rivers quickly. This quick flowing water does not have the opportunity to fill up the waterway as it is moving fast. It is not until the water reaches areas in the catchment that are flat does flooding become a problem. When neighbouring rivers join during floods aquatic animals get to migrate to different areas and provide valuable new genetic material to other populations.

In addition, the fast-flowing water brings fresh nutrients and soils from other areas in the catchment. This then makes it a great place to grows crops and food.



Floods

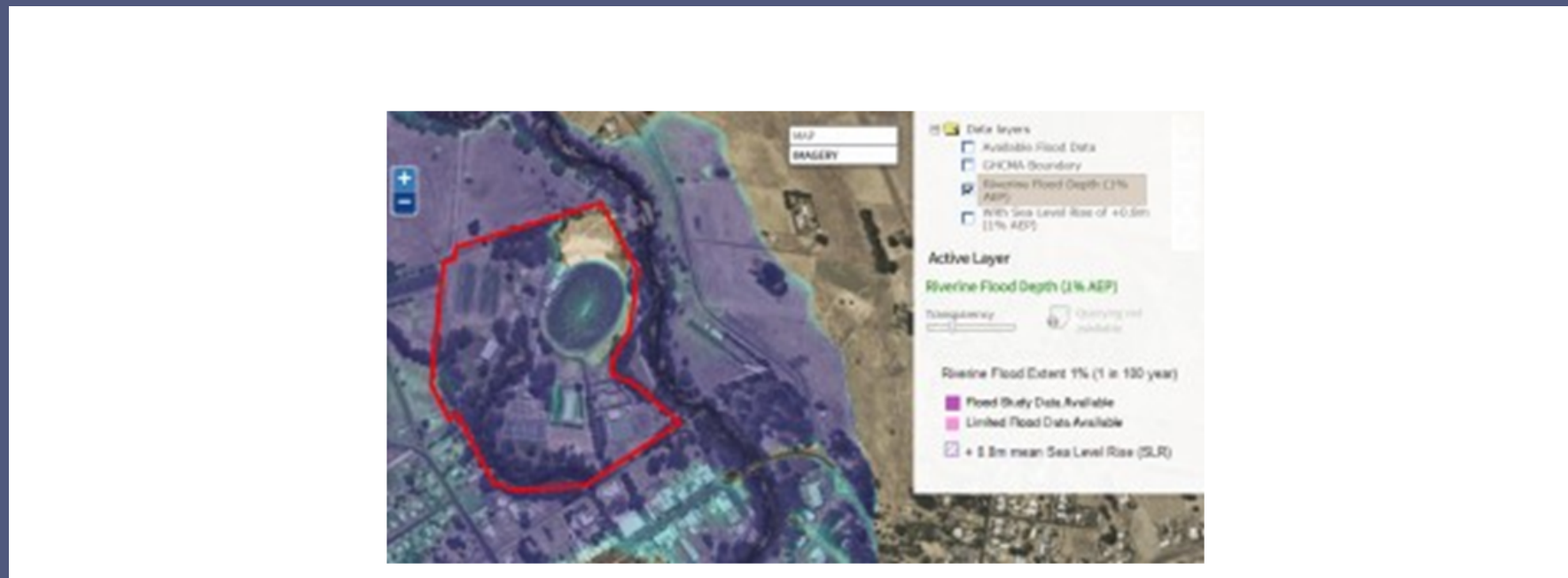


How can models be made that tell us about floodplain management?

Understanding flooding can mean assets such as houses, farms, sheds, schools, roads and bridges can be protected in a flooding event.

How do we know where the water will go? In some circumstances it is not possible to predict where the water will go, but gathering data when there is a flood event gives a good indication of where the water might end up. The most effective flood water data is photographs and marking high water.

When there is data a model can be made that is used to predict future risks in the floodplain such as the one below.



AN EXAMPLE OF A FLOOD PLAIN MODELS WHERE THE RED LINE IS THE PROPERTY AND THE PURPLE IS THE PREDICTED FLOOD EXTENT.

Flooding happens all over the world, what can we learn?

Japan for example has prepared for Typhoons and their associated flooding by building massive storm water tunnels under large cities like Tokyo. In

Denmark cities prepare for flooding by building parks that are designed to flood, therefore concentrating flood water into areas away from houses, roads and other infrastructure. If we know that flooding could get worse there is a chance to prepare.



TOKYO STORM WATER DRAINS – WOW!!



How can we innovate the floodplain management?

What sort of impacts will climate change and flooding have on our society and how can these impacts be minimised?

Is there a way to balance the good and bad aspects of flooding?

How can we educate people about what happens when we develop floodplains?

How can engineers and councils design with natural disasters such as flooding in mind?

If we didn't do anything what would change?

