Government of South Australia
Department for Housing and Urban Development

Frequently Asked Questions

Flood Hazard Mapping and Assessment Project

Learn about the Flood Hazard Mapping and Assessment Project, including new and enhanced flood studies that informed updates to the mapping and planning rules in the draft State-wide Flood Hazard Code Amendment.

Q – What is the State Planning Commission's Flood Hazard Mapping and Assessment Project?

A – The State Planning Commission, together with the Department for Housing and Urban Development, is undertaking the Flood Hazard Mapping and Assessment Project to highlight the risk of potential flood hazards, while delivering more consistent and contemporary mapping of riverine and surface water flood hazards for the state.

It also aims to help mitigate the impacts of projected climate conditions such as more frequent, extreme weather events and sea level rise.

The project aims to provide greater certainty when undertaking and assessing new developments and also in informing rezoning, regional planning and emergency management. In addition, the data will serve as a valuable asset across several government departments, services and activities.

The first stage involved delivering the Flooding Hazards Mapping Update Code Amendment, which updated the Hazards (Flooding - Evidence Required) Overlay for 13 local government areas and several townships in outback areas of the state.

The second stage involved procuring new, detailed flood studies to update and enhance flood hazard mapping across the state. The flood studies cover a range of flood events (including modelling of a 2050 scenario with projected climate conditions and development growth scenarios).

The new and enhanced flood hazard mapping used improved data and more consistent modelling to better identify flood hazard. The updated data and mapping informed the proposed changes to flood policies and mapping in the draft State-Wide Flood Hazard Code Amendment.

The State-Wide Flood Hazard Code Amendment is the final stage of this project.

The project is funded by a $3 million COVID-19 stimulus grant. Visit the PlanSA website to learn more.

Q – Where can I find out more about the Flooding Hazards Mapping Update Code Amendment?

A – The Flooding Hazards Mapping Update Code Amendment updated the extent of the Hazard (Flooding – Evidence Required) Overlay in the Planning and Design Code in 13 local government areas and several outback areas of the state.

The code amendment was finalised in 2021 and:

- reduced the extent of the Hazards (Flooding - Evidence Required) Overlay for 13 local government and several outback areas, based on more recent flood studies and previously unavailable flood hazard mapping
- applied the Hazards (Flooding – Evidence Required) Overlay to the north-eastern portion of the Port Adelaide Enfield council area, as a precautionary measure, until updated flood hazard mapping could be prepared and implemented into the Planning and Design Code.

This code amendment was the first stage of the Flood Hazard Mapping and Assessment Project.

Further information about the Flood Hazards Mapping Update Code Amendment is available on the PlanSA website.

Q – What detailed flood studies were commissioned as part of stage 2 of the Flood Hazard Mapping and Assessment Project?

A – During stage 2 of the project, the department commissioned 30 new and enhanced flood studies for areas subject to higher flood risk, impacting development assessment, infrastructure delivery and emergency services management.

These studies, carried out in 2022, included:

1. Fleurieu Peninsula Townships
2. Onkaparinga River Lower
3. River Torrens (Lower) and River Torrens (Upper) Townships
4. Sturt River (Lower)
5. Clare Gilbert Valleys
6. Light River
7. Naracoorte
8. Smith Creek
9. Gawler extended Model
10. Adams Creek and Greater Edinburgh Park, Little Para River
11. First to Fifth Creek
12. Marion Holdfast Bay

13. Nuriootpa
14. Port Lincoln
15. West Lakes
16. Goolwa to Port Elliot
17. Balaklava to Wakefield
18. Barker Inlet
19. Bremer River at Langhorne Creek
20. Cobbler Creek
21. Lefevre Peninsula
22. Moonta Area
23. Mount Barker
24. Port River East
25. Port Road
26. Strathalbyn
27. Upper Onkaparinga River Townships
28. Victor Harbor
29. Wallaroo
30. Kadina.

The mapping resulting from these studies is demonstrated in the draft flood hazard overlays released for consultation as part of the State-wide Flood Hazard Code Amendment.

These new and enhanced flood studies will also be used by other South Australian government agencies for other purposes. For example, the Department for Environment and Water will incorporate these studies in updating their Flood Awareness Map, and South Australian State Emergency Service (SES) will use these studies to help guide emergency management planning.

The detailed studies are also available to view as part of the consultation process.

Q – What regional coarse-scale data was commissioned as part of stage 2 of the Flood Hazard Mapping and Assessment Project?

A – During stage 2 of the project, the department purchased regional coarse-scale riverine and surface water data, where no detailed flood study was available to map flood hazard.

Coarse-scale flood data is generalized, low-resolution flood modelling used for regional planning, broad-level risk screening, and emergency management. It covers large areas quickly and inexpensively but does not provide fine-grained information gained through detailed flood studies.

The data was purchased at a 5 metre scale for a 1 in 100-year flood for greater Adelaide and 30 metre scale for a 1 in 200-year flood for far north, regional and remote areas.

Given the scale and accuracy is much broader than for a detailed flood study, the coarse data was used to identify areas that may require a detailed flood study and areas where a detailed flood study was not required.

The flood data covered a 5 metre buffer on each side of watercourses in urban areas and 15 metres each side of watercourses for regional areas. It also covered surface water exceeding 1 metre in depth over an area of 5 metres for urban areas and 30 metres for regional areas. This data was overlapped with flood studies where a clear flood study extent was not available.

This modelling was used to inform the Hazards (Flooding – Evidence Required) Overlay and enabled the extent of this overlay to be significantly reduced.

Q – Were any other flood studies released during the Flood Hazard Mapping and Assessment Project?

A – Additional council flood studies and flood hazard information were made available during the project.

These included flood studies that could not be released when the Planning and Design Code commenced and flood studies used to reduce the Hazards (Flooding – Evidence Required) Overlay in the Flooding Hazards Mapping Update Code Amendment (stage 1).

Council flood studies made available under stage 1 of the project were:

- Burnside Floodplain Mapping 2019 (First to Third Creeks Catchment)
- Auburn Stormwater Management Plan 2019
- Brown Hill Creek Urban Catchment Stormwater Management Plan (2017)
- Dry Creek Stormwater Management Plan 2021 (noted this was draft at stage 1 and completed by stage 2).

Council flood studies and flood hazard data made available under stage 2 of the project included:

- Anderson Avenue
- Barker Inlet Central Stormwater Management Plan 2021
- Dry Creek Stormwater Management Plan 2021
- Combined Longterm Litle Para Helps Road, Adams Creek 2011
- Naracoorte Hazard 2018
- Old Dry Creek 2008
- Sturt Creek Urban Catchment 2017
- Torrens Road Drainage Authority 2015
- Unley Urban Floodplain Mapping 2019.

These flood studies are proposed to be used in the new and enhanced Hazards (Flooding) Overlay and Hazards (Flooding – General) Overlay mapping as part of the State-wide Flood Hazard Code Amendment.

Q – The council has prepared more recent flood studies. Will these studies be included in the draft State-Wide Flood Hazard Code Amendment mapping?

A – No, only the flood studies made available through the Flood Hazard Mapping and Assessment Project and consulted on as part of the draft State-Wide Flood Hazard Code Amendment would be used.

However, the draft code amendment proposes a way to make it faster and easier to update flood hazard mapping as more contemporary studies become available.

Q – What method was used for undertaking new and enhanced flood studies and preparing new flood hazard mapping?

A – During stage 2 of the project, 30 new and enhanced flood studies were commissioned to update the spatial application of the Hazards (Flooding) Overlay and Hazards (Flooding – General) Overlays.

The studies used contemporary hydrological information, consistent methodology, updated Light Detection and Ranging (LiDAR) Digital Elevation Modelling (DEM), and flood modelling to 2022 using current average data, and flood modelling to 2050 with the following projected climate conditions and development assumptions:

- **Rainfall intensity**: ARR 2019 predicted an increase in rainfall (intensity and depth) of 5% per °C of local warming.
- **Sea-level rise:** the Coast Protection Board recommended a sea-level rise of 300 mm – sea-level rise is relevant for watercourses or stormwater infrastructure that flows out to sea.
- **Future development:**
    - Planning policy considerations such as zoning, site area and frontage were used to identify potential for infill development. The likely timeline of infill development was guided by the value of the home and other improvements relative to the land value. A lower ratio generally indicates that the site is a more likely candidate for redevelopment in the short to medium term.
    - For greenfield development it was assumed that land with a land division application proposing lots will be developed. Remaining land was estimated to be developed over time using the following assumptions:
        - privately owned land will be developed at 50% of full potential (allowing for owners that hold onto their land or don't develop to full potential)
        - company owned land will be developed at its full potential
        - other greenfield land (community/government) will not be developed.

The studies quantified flood hazard using the flood hazard classification curves and produced flood hazard mapping for three flood events to better understand flood hazard and align with national guidance[1]. These flood events included 5% AEP (1 in 20-year), 1 in 100-year (1% AEP) and 1 in 500-year (0.2% AEP) flood events for a 2022 scenario and a 2050 scenario.

Maps showing flood depth, velocity, and data for water surface elevation were also prepared to supplement the flood hazard modelling.

The modelling was then used to inform the Hazards (Flooding) Overlay and Hazards (Flooding – General) Overlay mapping.

Q – What are flood hazard classification curves?

A – Flood hazard classification curves are used to determine the level of safety and damage that floodwaters of a particular depth and velocity would have on a community.

Australian Disaster Resilience Guideline 7-3: Flood Hazard (AIDR 2017) identifies thresholds for each hazard classification level, increasing from H1 to H6 as follows:

Hazard classification	Vulnerability
H1	Generally safe for vehicles, people and buildings
H2	Unsafe for small vehicles
H3	Unsafe for vehicles, children and the elderly
H4	Unsafe for vehicles and people
H5	Unsafe for vehicles and people, all building types vulnerable to structural damage, some less robust building types vulnerable to failure
H6	Unsafe for vehicles and people, all building types considered vulnerable to failure

The curves are particularly useful to determine the level of vulnerability in circumstances such as where the flood depth is low but velocity is high, resulting in a higher flood hazard and vulnerability.

[1] Australian Disaster Resilience Guideline 7-3 Flood Hazard published by the Australian Institute for Disaster Resilience dated 2017

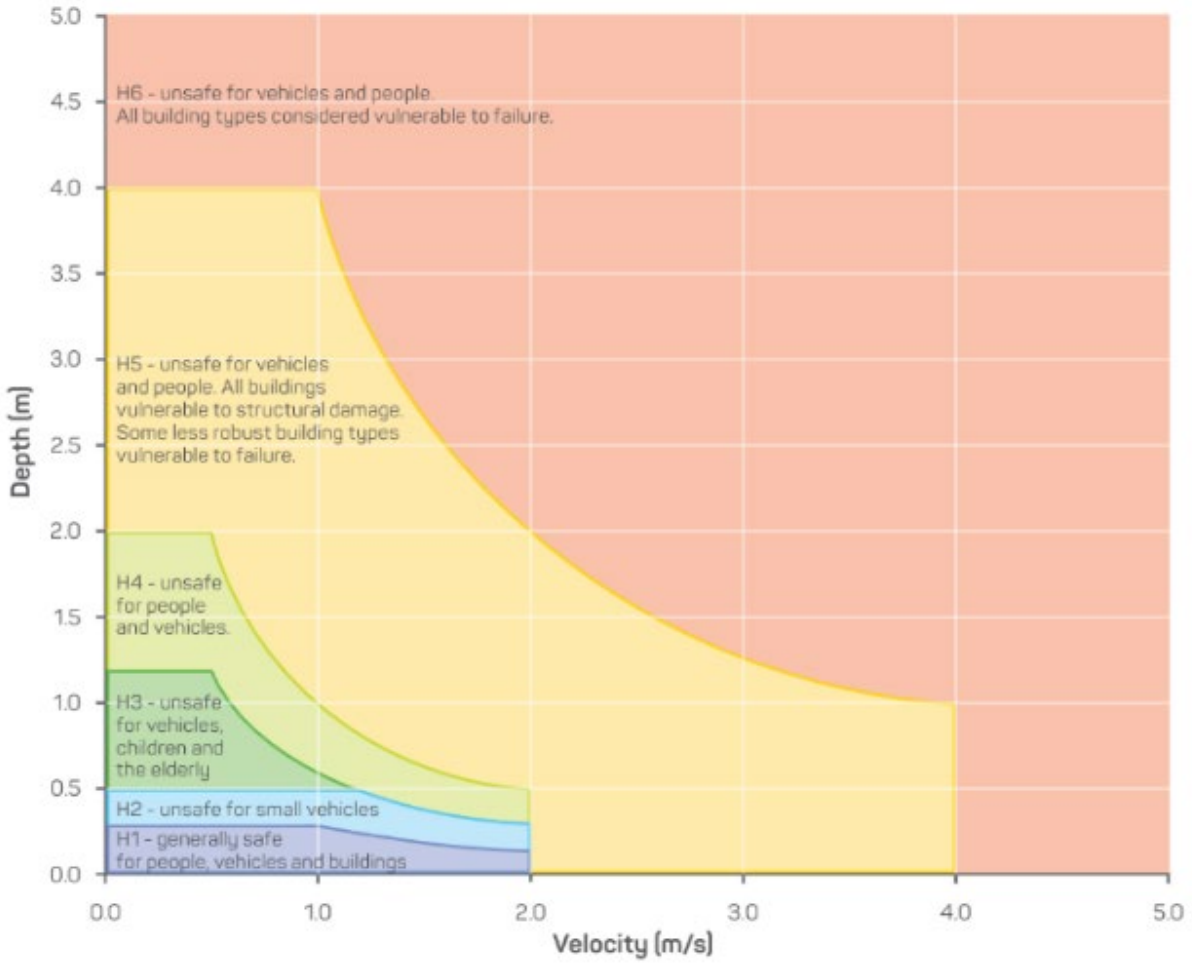


Figure: Australian Disaster Resilience Guideline 7-3 Flood Hazard published by the Australian Institute for Disaster Resilience dated 2017 and referred to the Flood Hazard, Technical Report 2014/07, prepared by Smith GP, Davey EK and Cox RJ at the Water Research Laboratory, University of New South Wales, Sydney dated 2014

Q – How are the flood hazard classification curves used in updating the flood hazard overlays in the State-Wide Flood Hazard Code Amendment?

A – The flood hazard classification curves have played an important role in identifying where the level of flood risk is considered tolerable and where it is considered intolerable.

The 30 new and enhanced flood studies, commissioned by the department to inform the updated mapping and related policies, used flood hazard classification curves to identify the level of flood hazard and vulnerability for an area.

The likelihood of a one in 100-year flood (1% AEP) and one in 20-year flood (5% AEP) to 2050 and the consequence (flood hazard classification levels with vulnerabilities in H1-H6) were put into a matrix to identify potential areas with tolerable or intolerable risk.

This approach was used to inform the new and updated mapping of the Hazards (Flooding – General) Overlay and Hazard (Flooding) Overlay respectively, with the associated policies.

The Hazards (Flooding – General) Overlay has been applied to areas with tolerable flood risk, where actions can be taken to mitigate the risk.

The Hazard (Flooding) Overlay has been applied to areas where there could be an intolerable flood risk and where actions would be required to avoid or reduce the risk.

		Flood hazard classification			
		H1	H2	H3	H4-6
Likelihood	1% AEP				
	5% AEP				

Legend	
	Tolerable flood risk
	Intolerable flood risk