



## Appendix C

WRL (2017) Coastal Hazard Maps



Note 1: Landward movement of the shoreline could be limited by the presence of bedrock.

Note 2: The shoreline could potentially move landward of the hazard lines in the watercourse entrance instability region due to lowering of the beach profile from entrance scouring.

### Maloneys Beach

### Deterministic erosion/recession hazard lines

- 2017
- 2050
- 2065
- 2100



Watercourse instability region

Figure I.1



Note 1: Landward movement of the shoreline could be limited by the presence of bedrock.

Note 2: Areas landward of the bedrock (non-erodible) line could be subject to coastal cliff or slope instability hazards which are beyond the scope of this study.

## Sunshine Bay

### Deterministic erosion/recession hazard lines



Figure I.12



Note 1: Landward movement of the shoreline could be limited by the presence of bedrock.

Note 2: The shoreline could potentially move landward of the hazard lines in the watercourse entrance instability region due to lowering of the beach profile from entrance scouring.

Guerilla Bay (south)

Deterministic erosion/recession hazard lines

- 2017
- 2050
- 2065
- 2100

Watercourse instability region

Figure I.17



Note 1: Landward movement of the shoreline could be limited by the presence of bedrock.

Note 2: The shoreline could potentially move landward of the hazard lines in the watercourse entrance instability region due to lowering of the beach profile from entrance scouring.

Note 3: Hazard lines do not extend to the western end of the beach as this is the limit of available photogrammetry.

### Barlings Beach

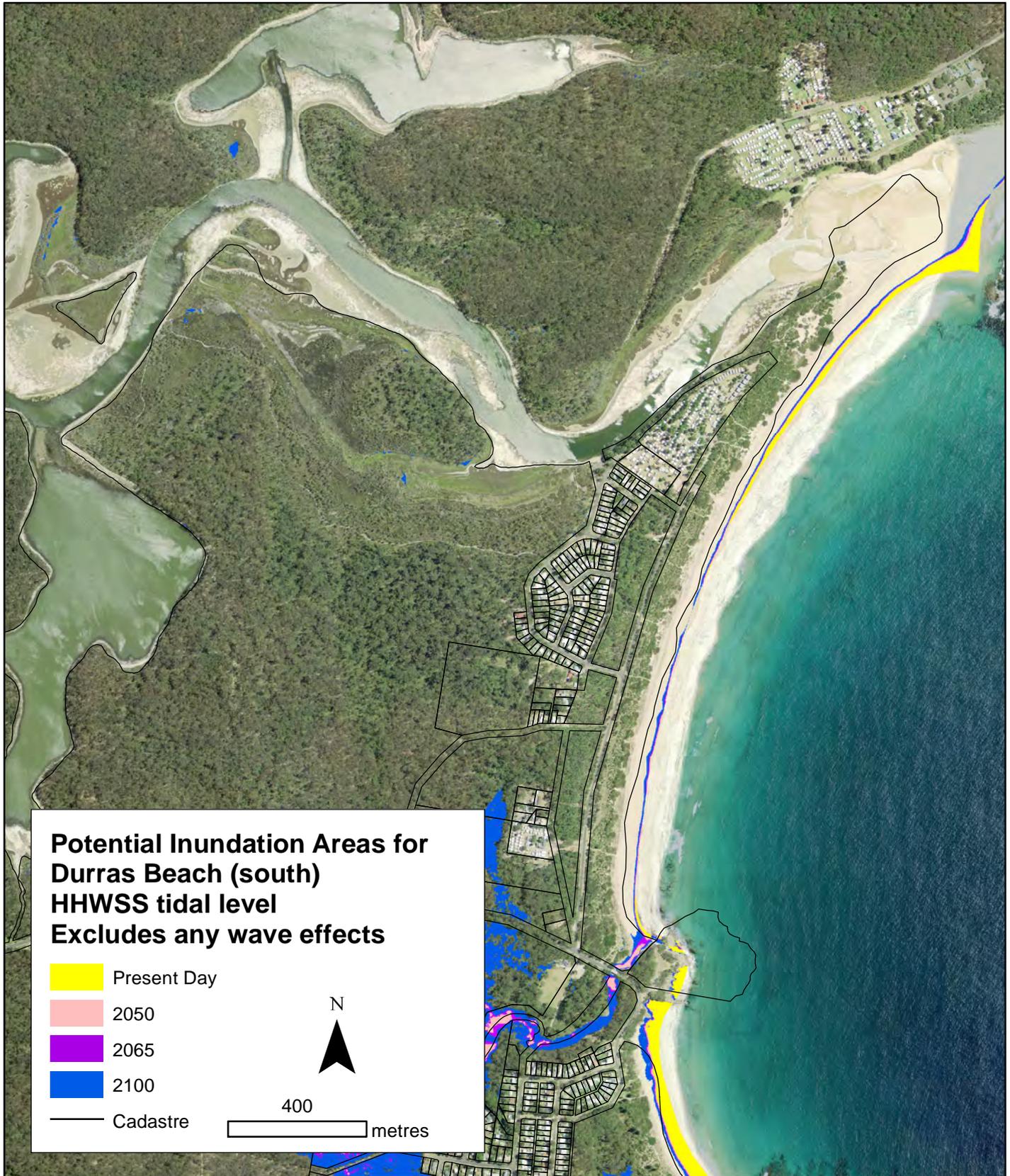
### Deterministic erosion/recession hazard lines

- 2017
- 2050
- 2065
- 2100



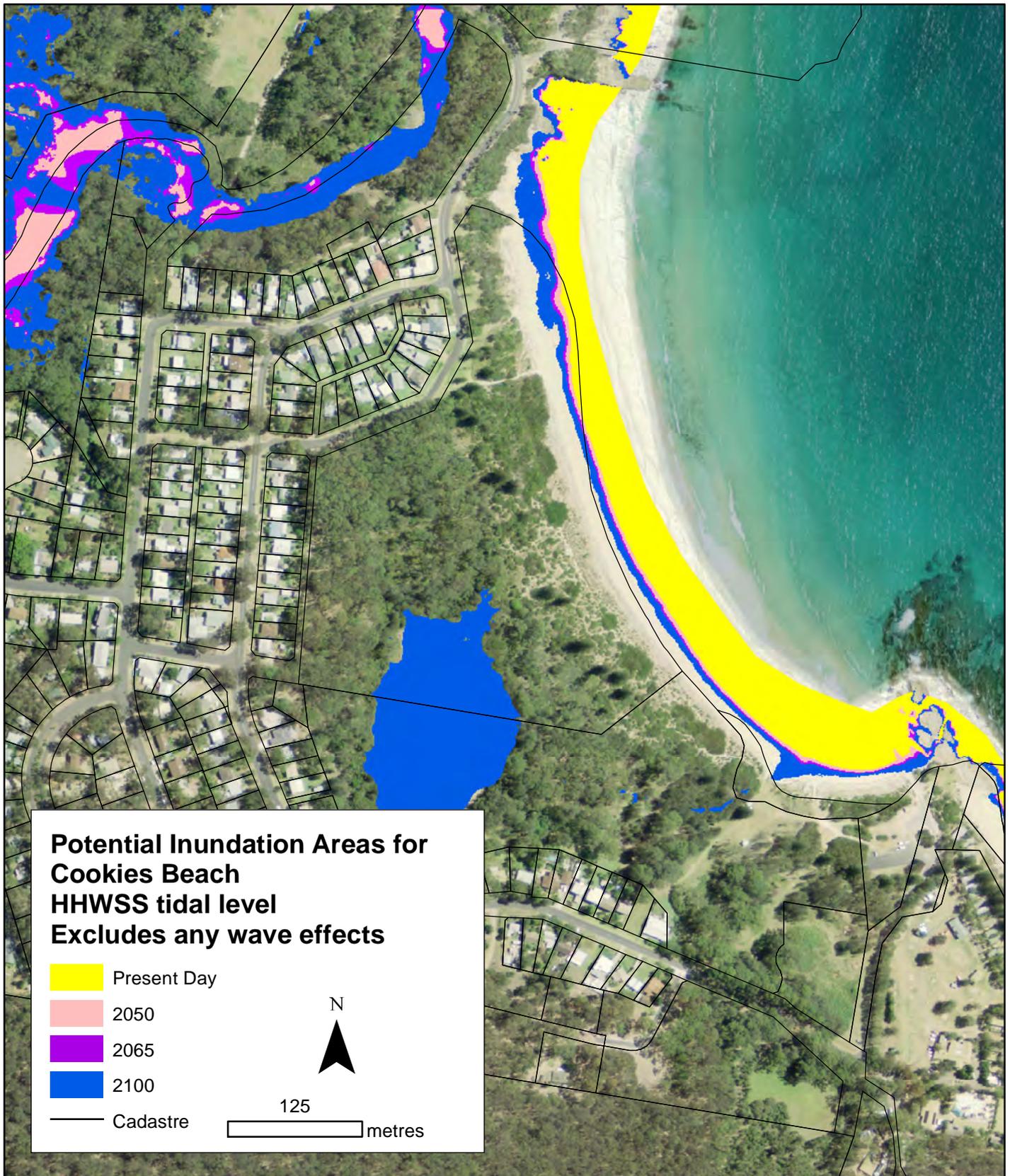
Watercourse instability region

Figure I.18



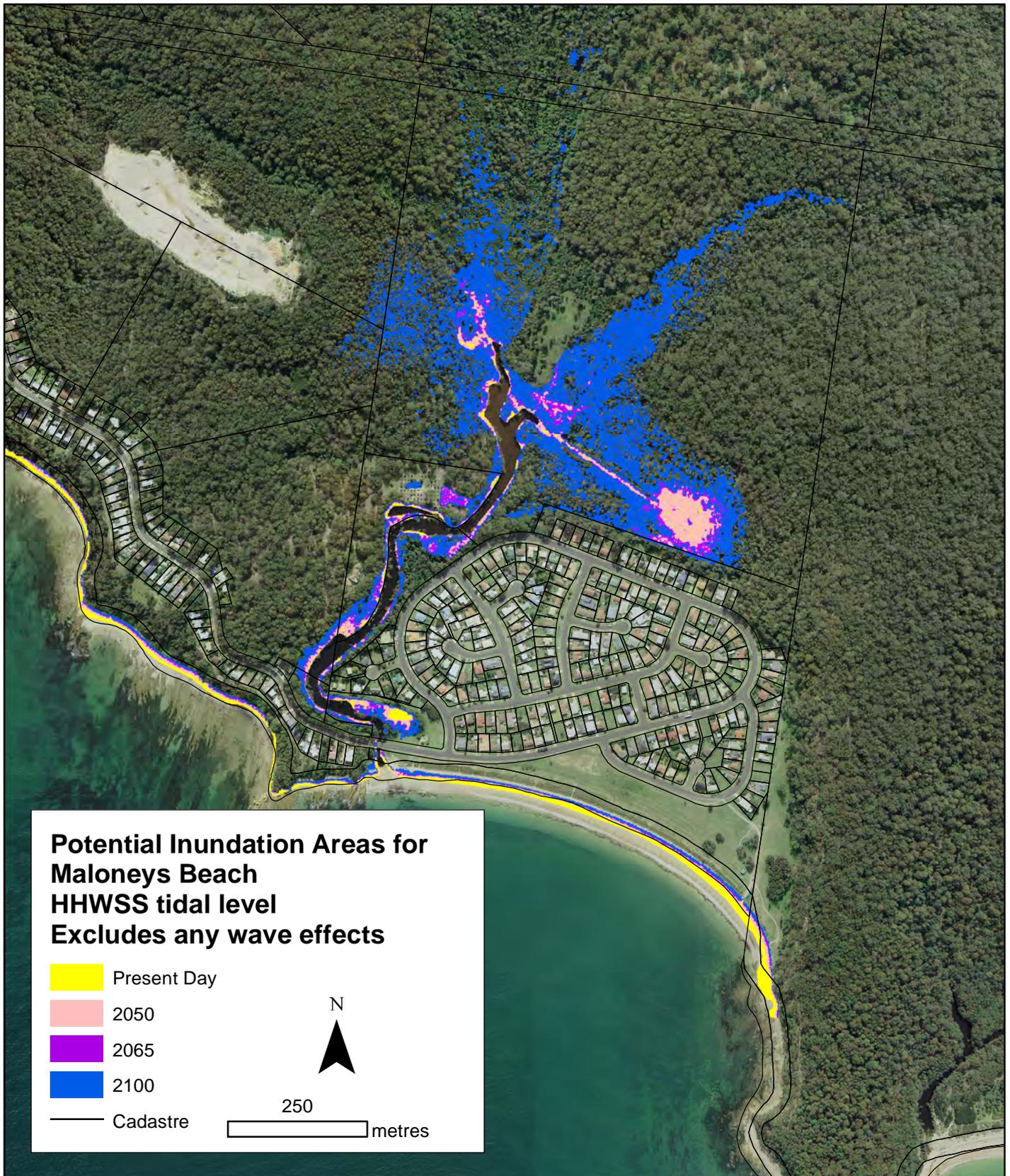
Inundation areas are mapped based on the most recent year of LIDAR data available (2011). The mapping has been based on the ground elevation (the "all ground" LIDAR layer) and does not consider flow paths, flow velocities or loss of flow momentum. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. WRL is not responsible for the accuracy of the LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure K.1**



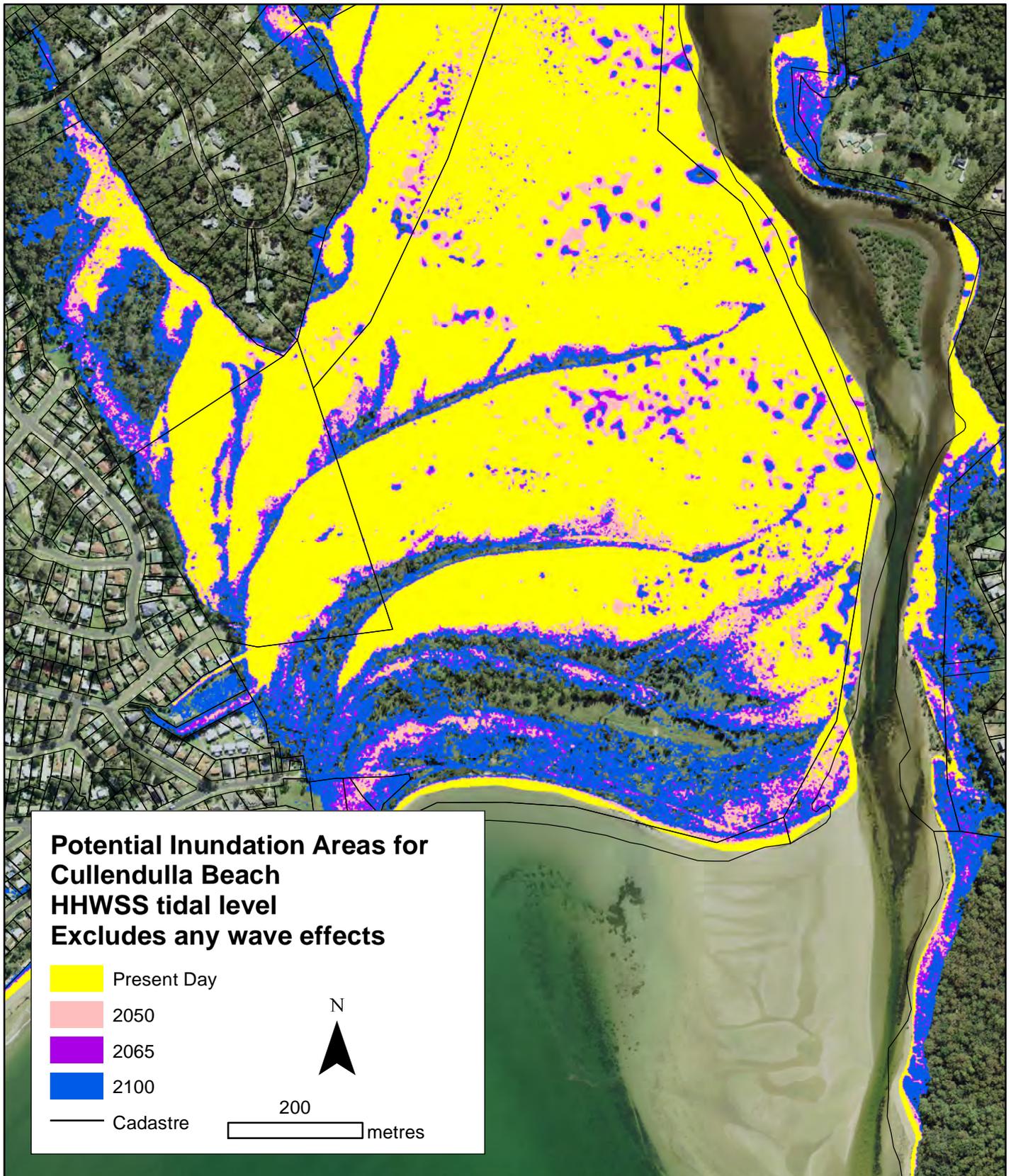
Inundation areas are mapped based on the most recent year of LIDAR data available (2011). The mapping has been based on the ground elevation (the "all ground" LIDAR layer) and does not consider flow paths, flow velocities or loss of flow momentum. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. WRL is not responsible for the accuracy of the LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure K.2**



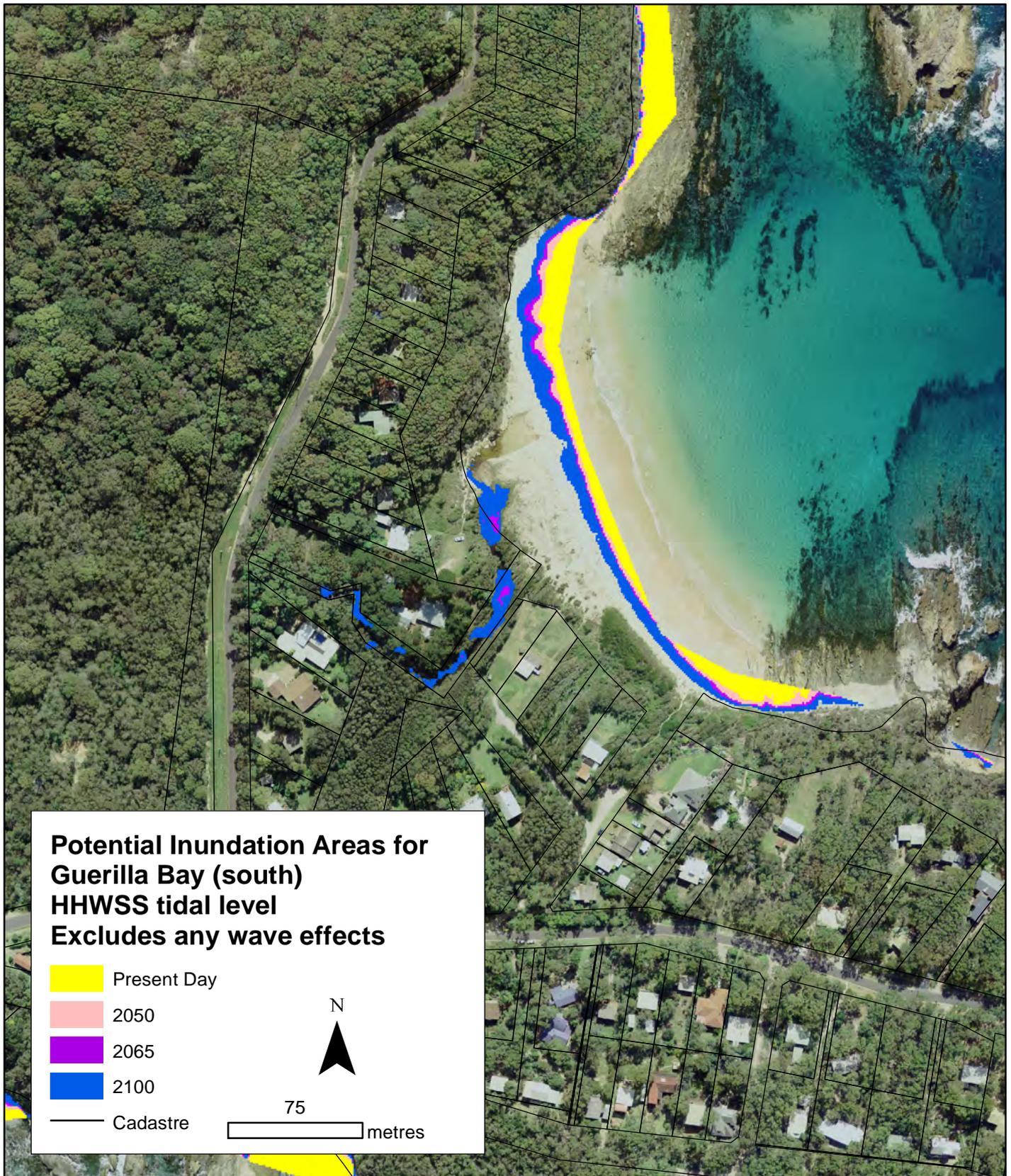
Inundation areas are mapped based on the most recent year of LIDAR data available (2005). The mapping has been based on the ground elevation (the "all ground" LIDAR layer) and does not consider flow paths, flow velocities or loss of flow momentum. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2005 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. WRL is not responsible for the accuracy of the LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure K.3**



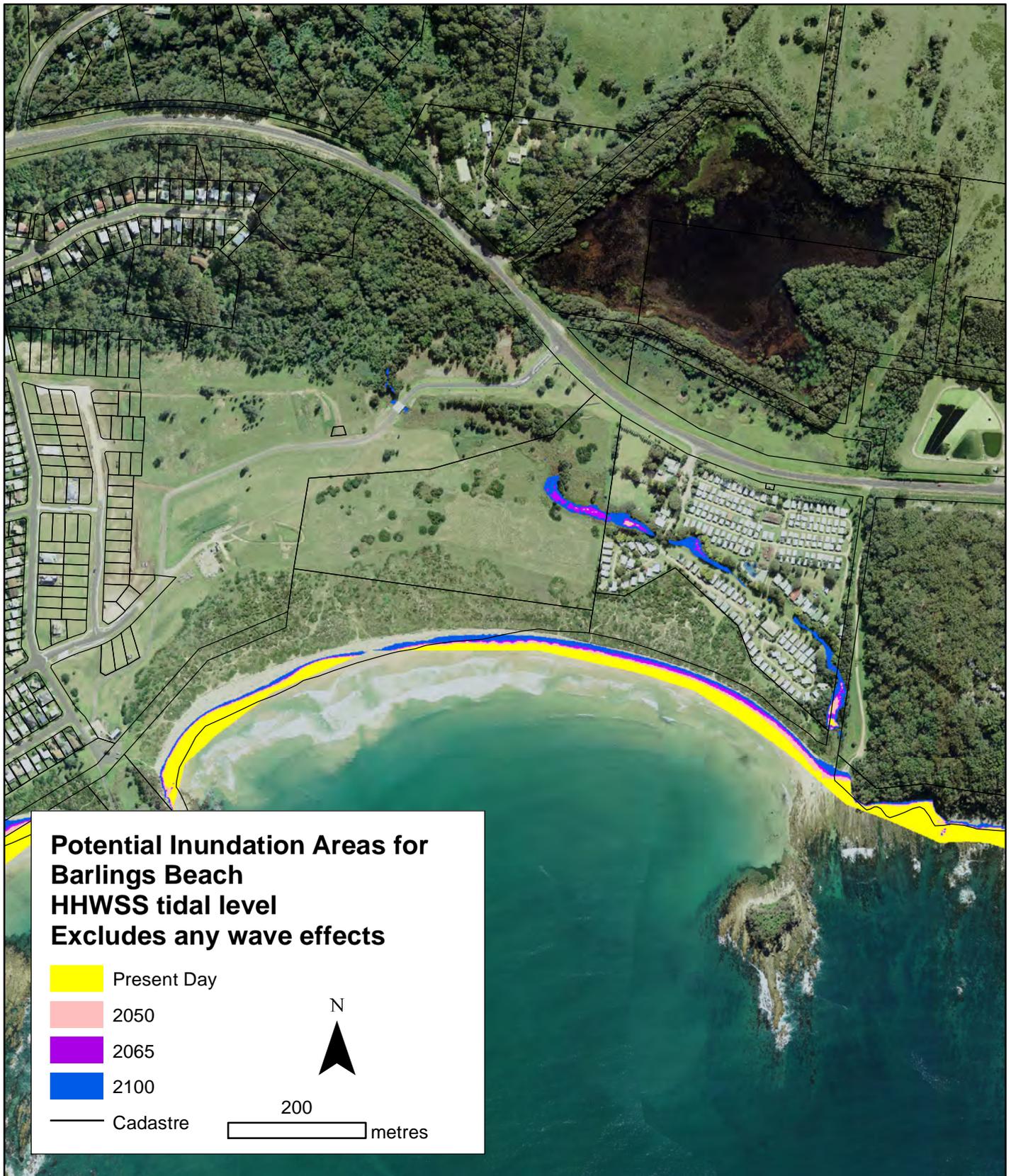
Inundation areas are mapped based on the most recent year of LIDAR data available (2005). The mapping has been based on the ground elevation (the "all ground" LIDAR layer) and does not consider flow paths, flow velocities or loss of flow momentum. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2005 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. WRL is not responsible for the accuracy of the LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure K.7**



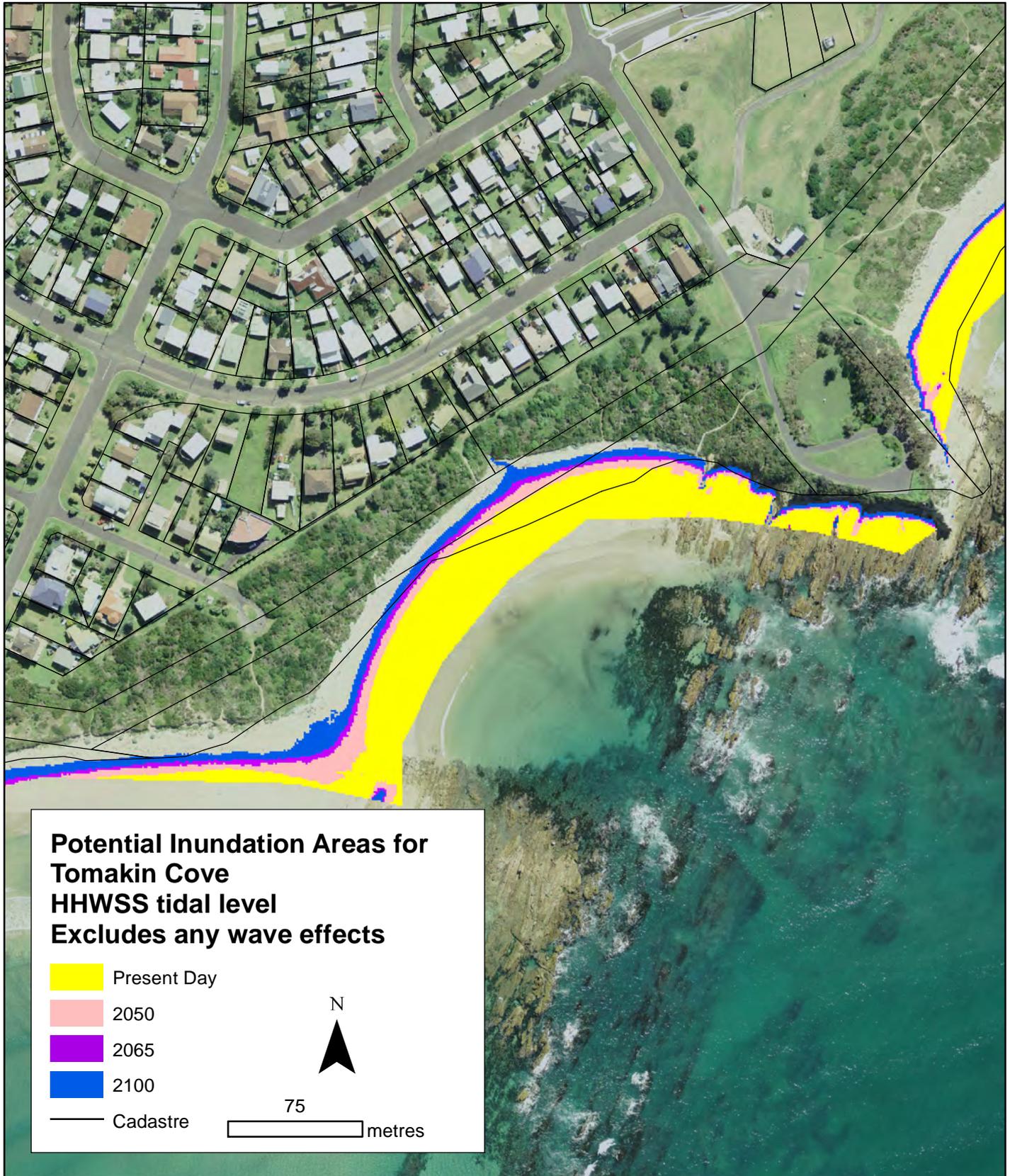
Inundation areas are mapped based on the most recent year of LIDAR data available (2011). The mapping has been based on the ground elevation (the "all ground" LIDAR layer) and does not consider flow paths, flow velocities or loss of flow momentum. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. WRL is not responsible for the accuracy of the LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure K.16**



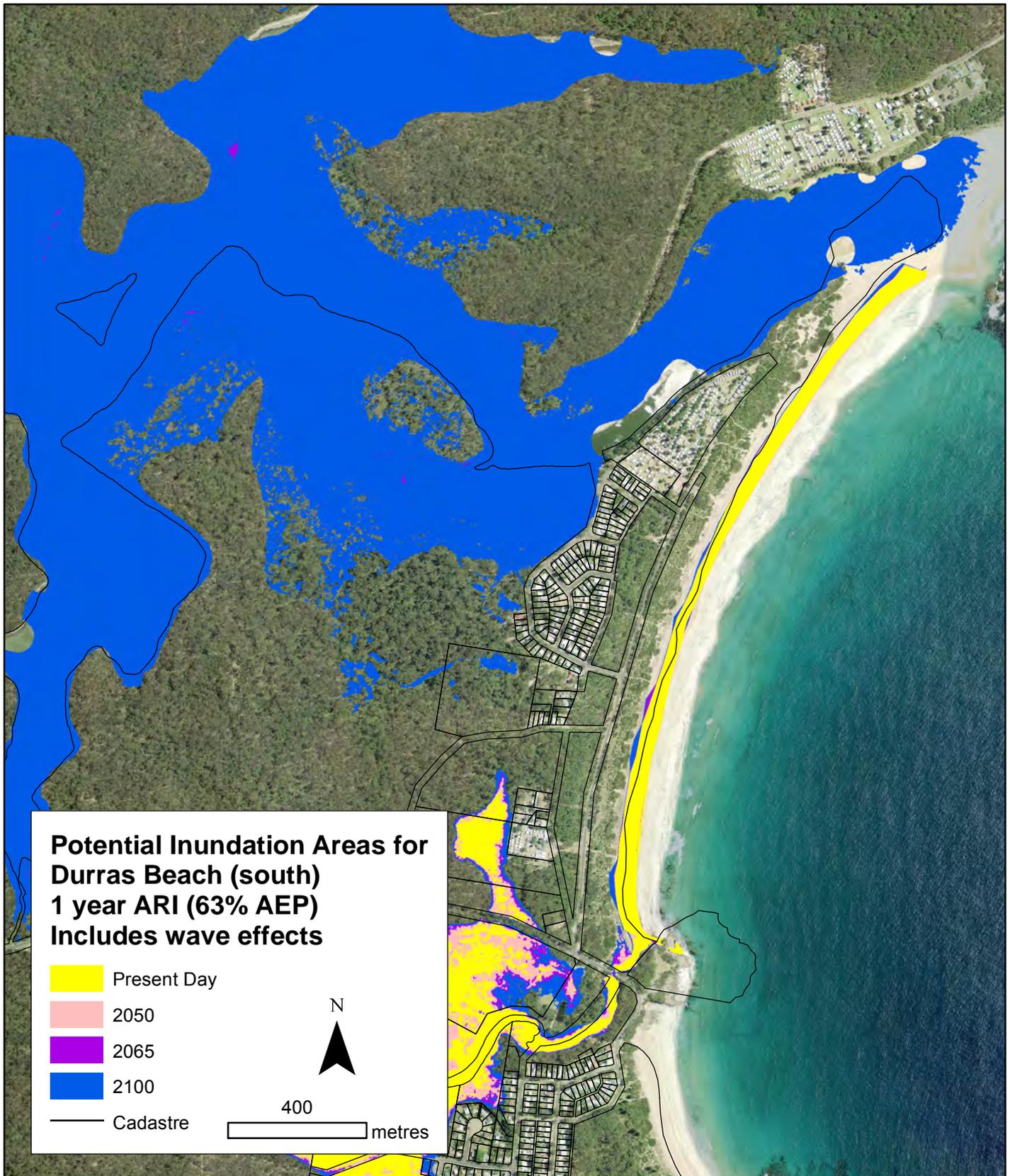
Inundation areas are mapped based on the most recent year of LIDAR data available (2011). The mapping has been based on the ground elevation (the "all ground" LIDAR layer) and does not consider flow paths, flow velocities or loss of flow momentum. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. WRL is not responsible for the accuracy of the LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure K.17**



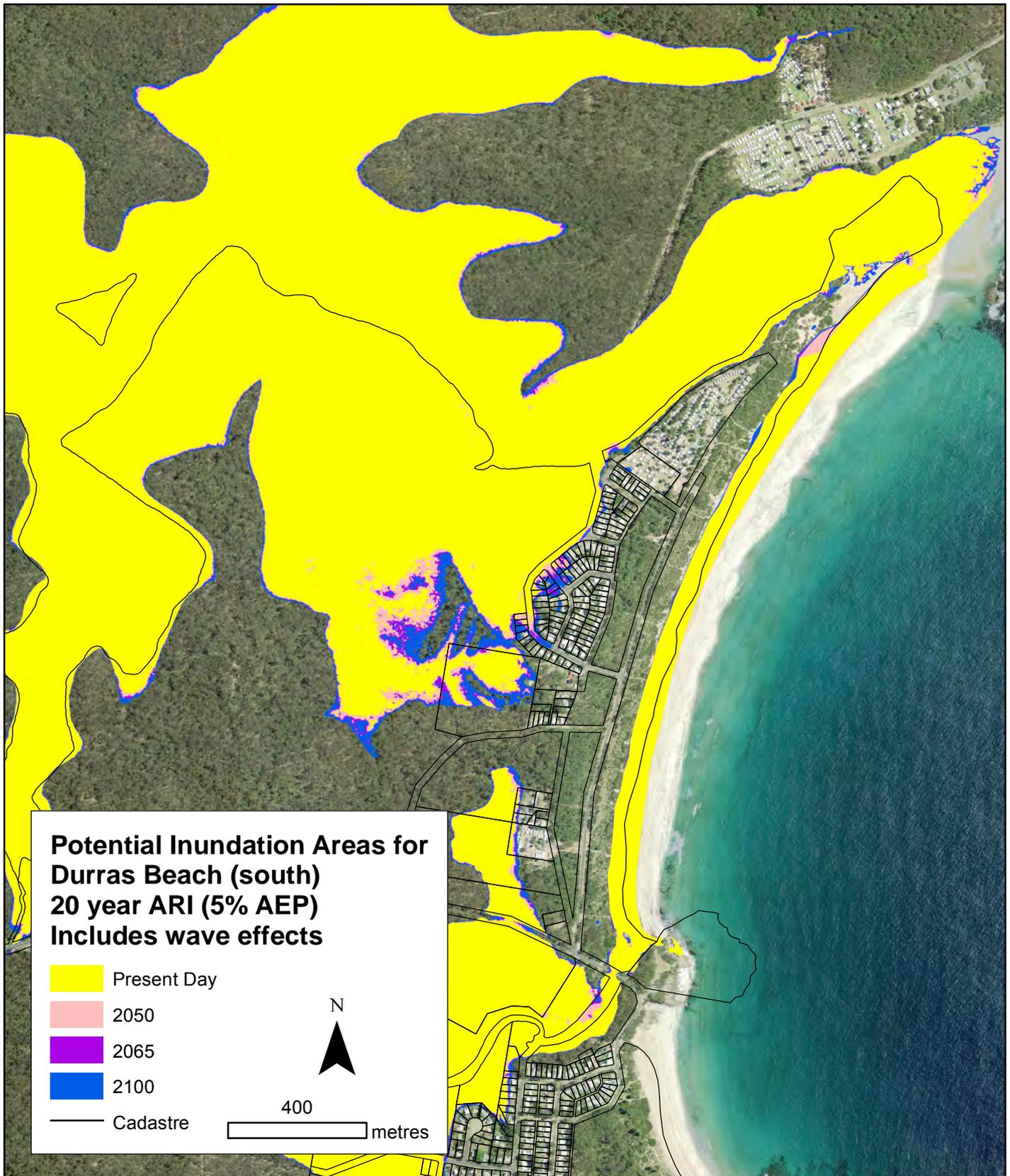
Inundation areas are mapped based on the most recent year of LIDAR data available (2011). The mapping has been based on the ground elevation (the "all ground" LIDAR layer) and does not consider flow paths, flow velocities or loss of flow momentum. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. WRL is not responsible for the accuracy of the LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure K.18**



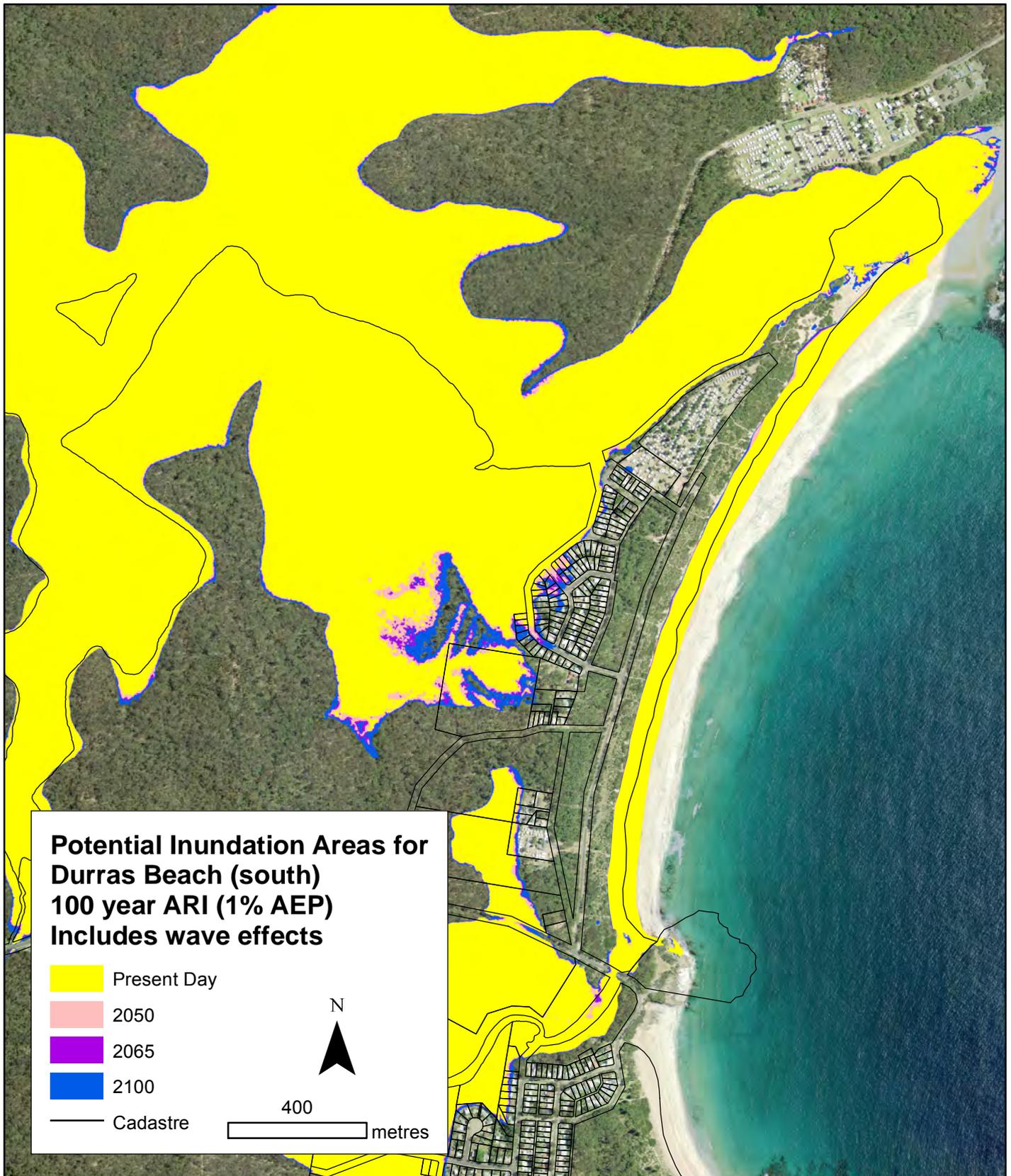
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.1**



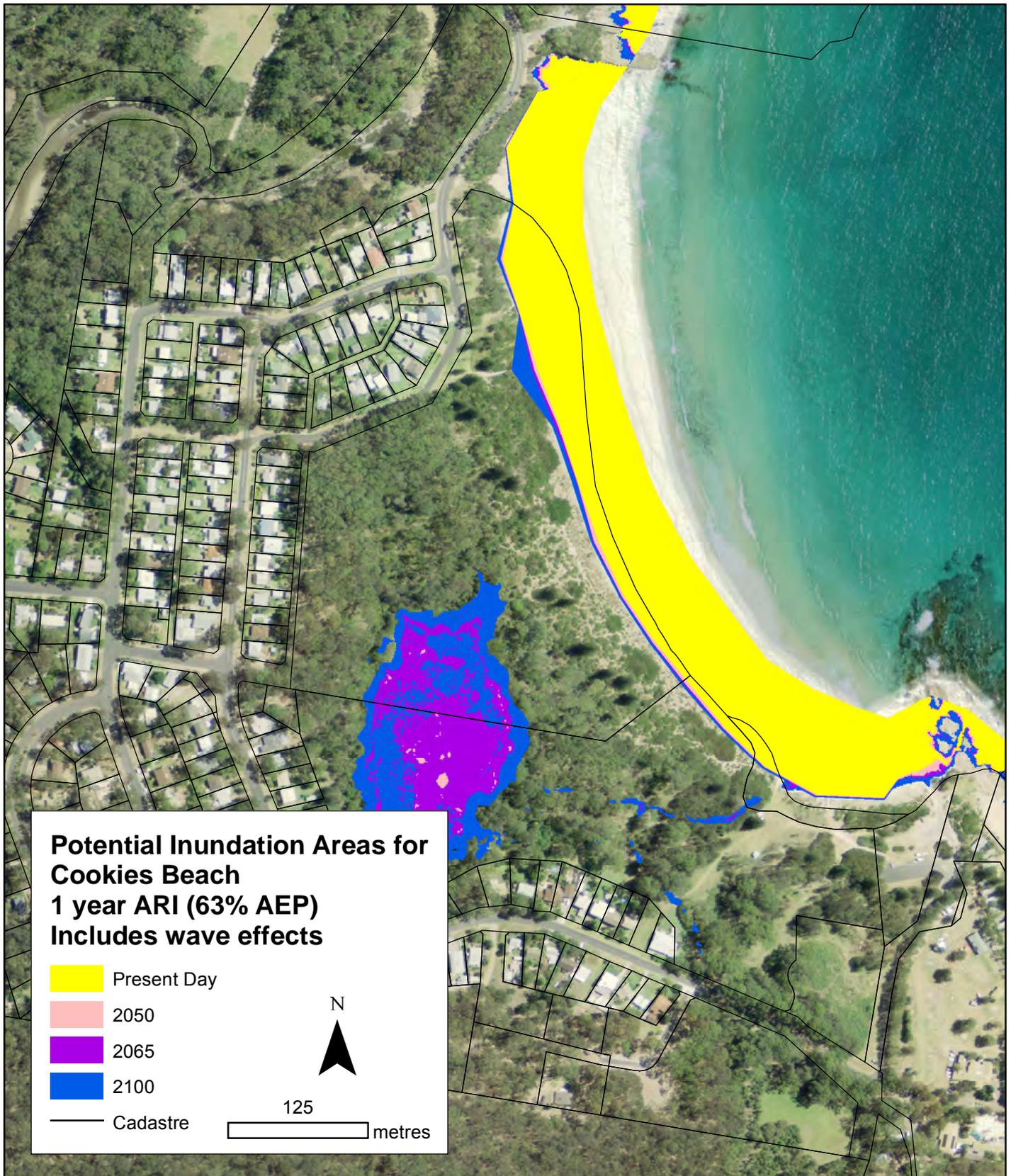
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.2**



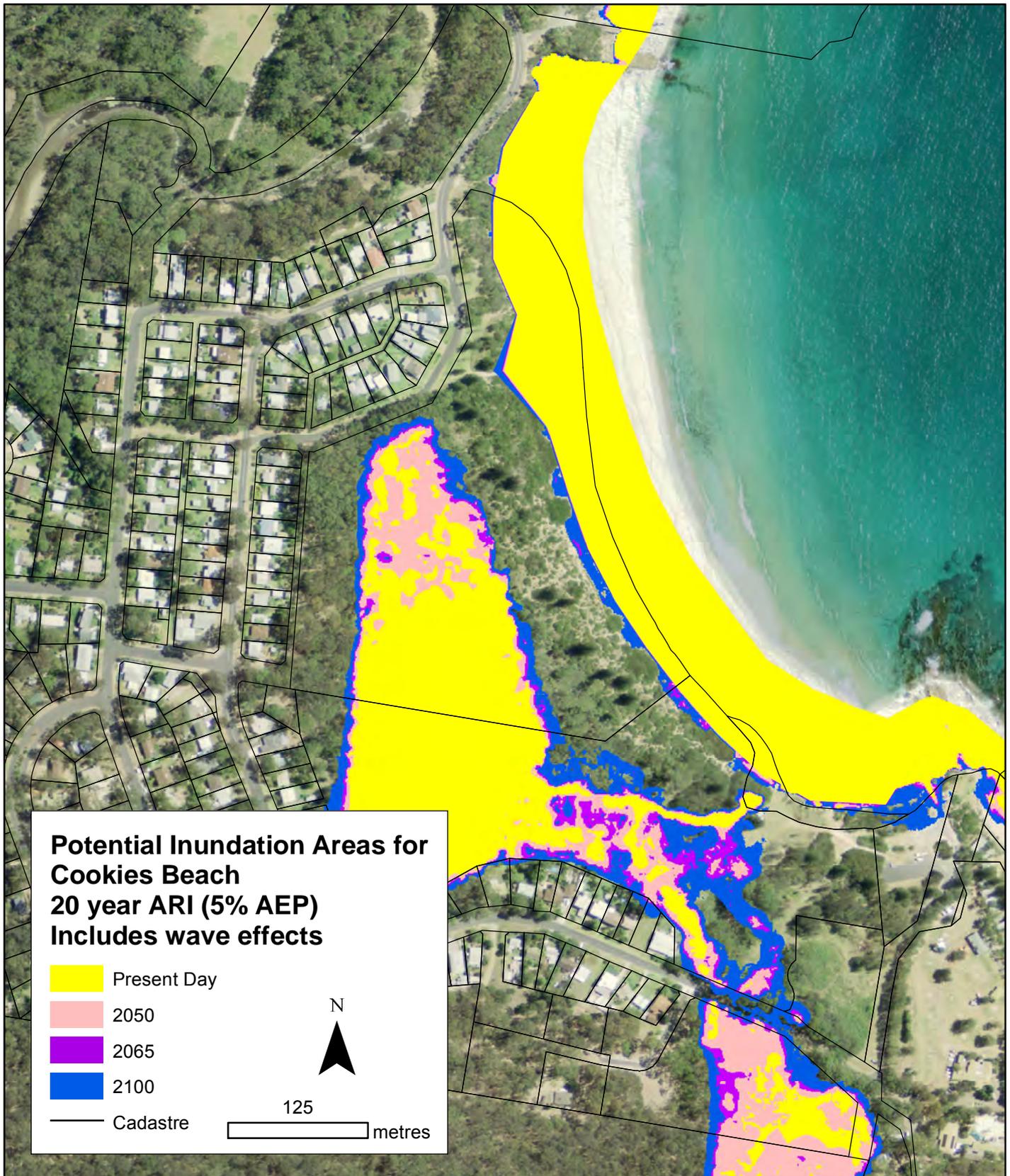
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.3**



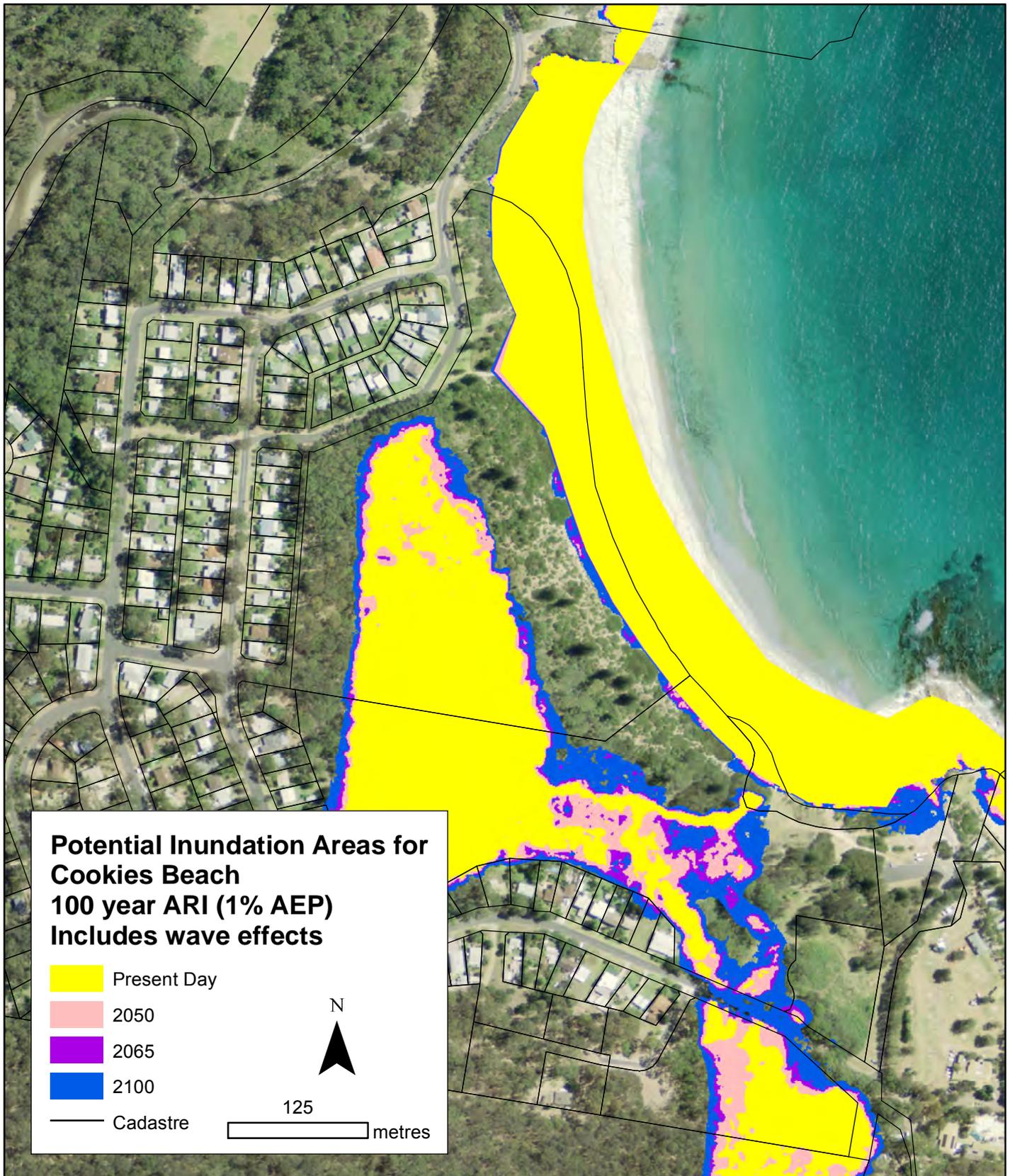
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.4**



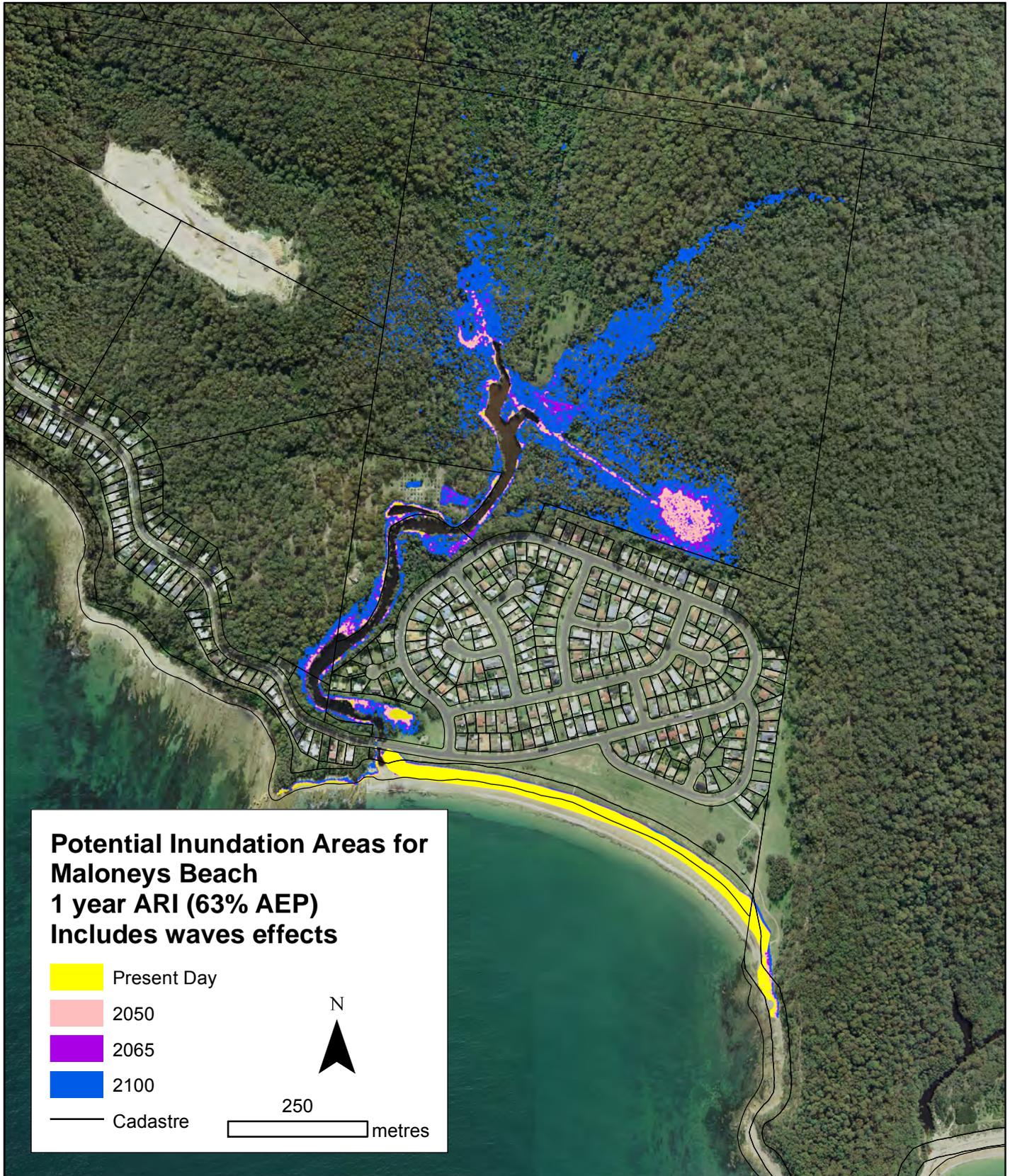
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.5**



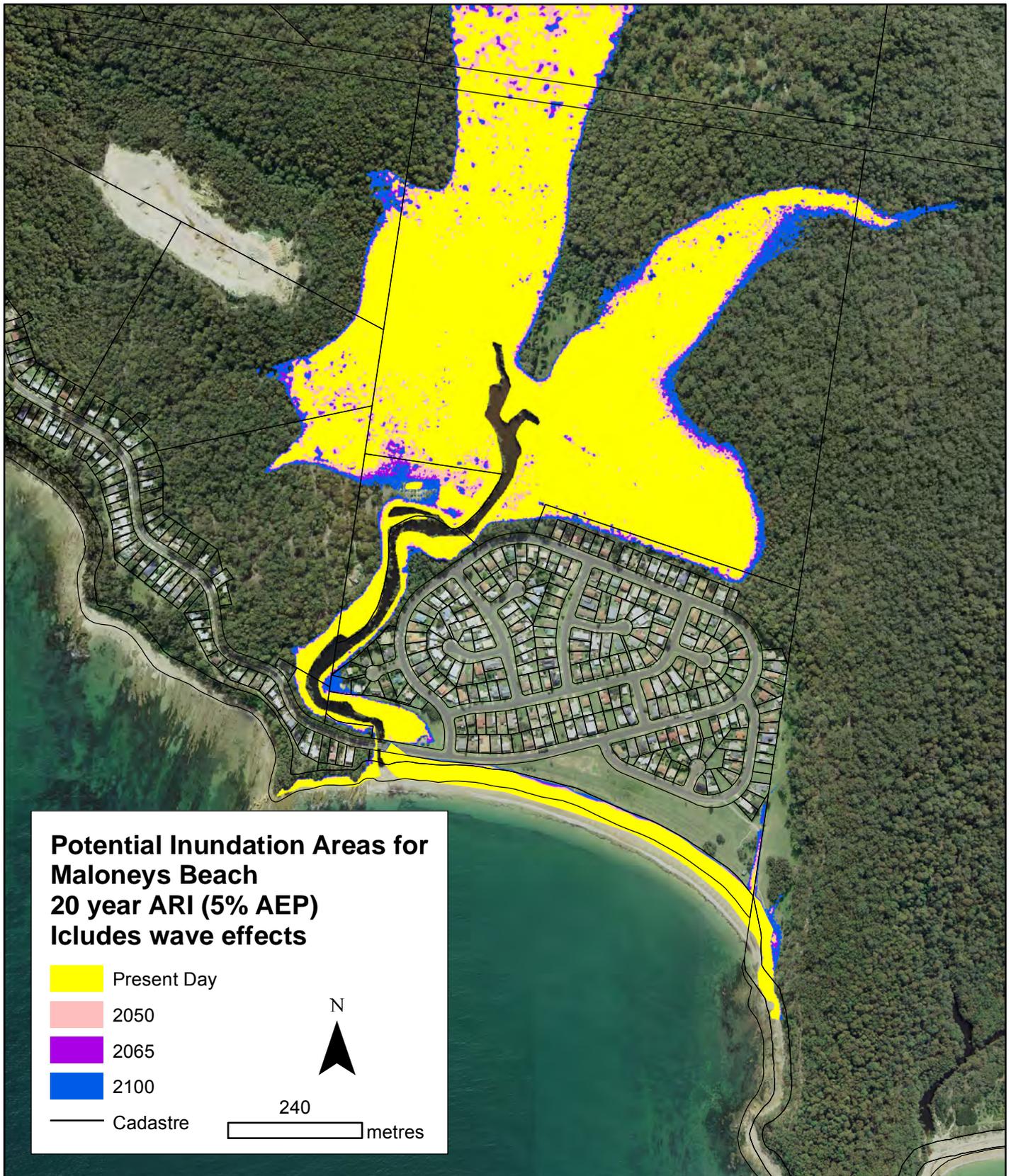
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.6**



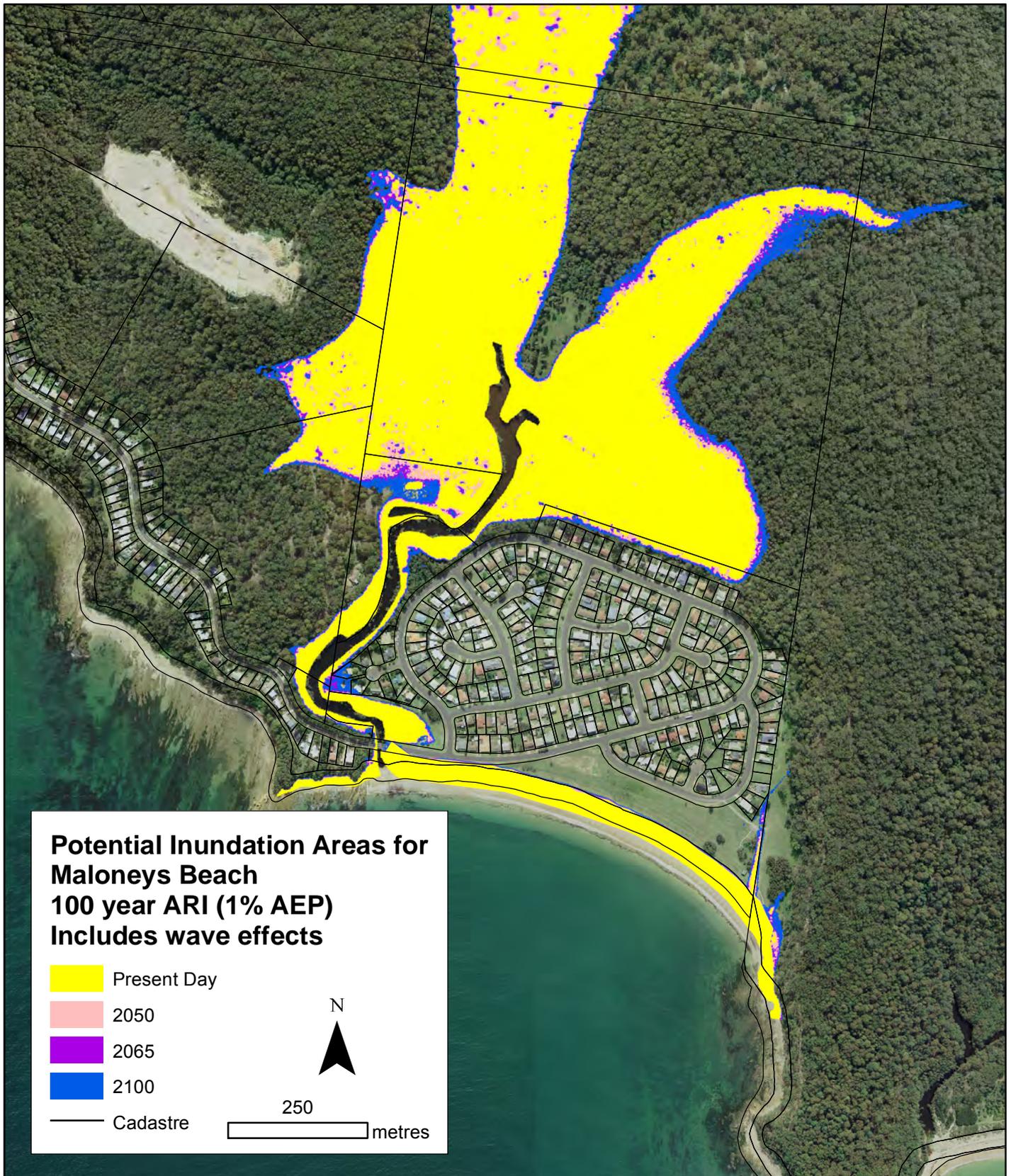
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2014) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2014 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2005). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.7**



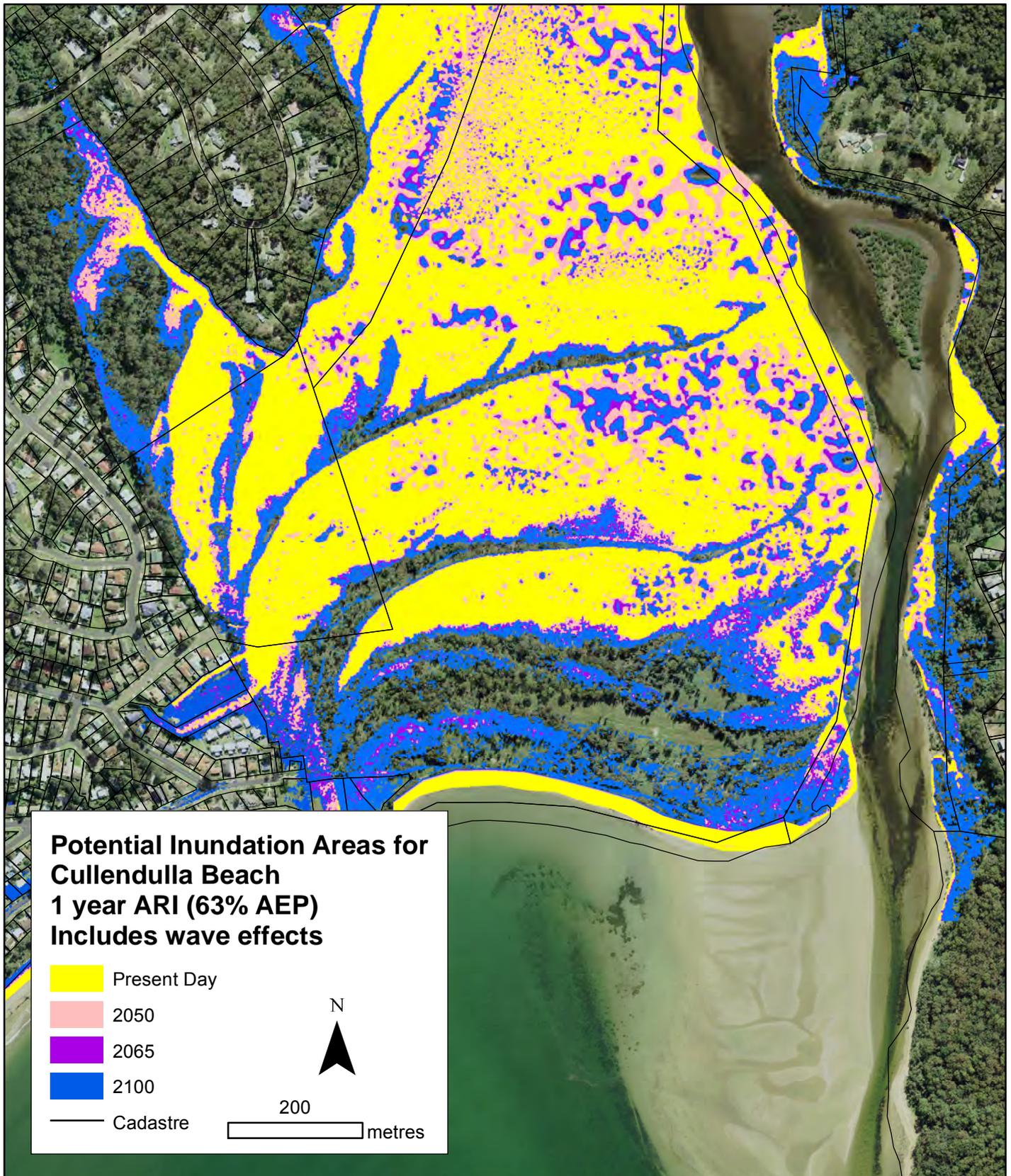
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2014) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2014 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2005). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.8**



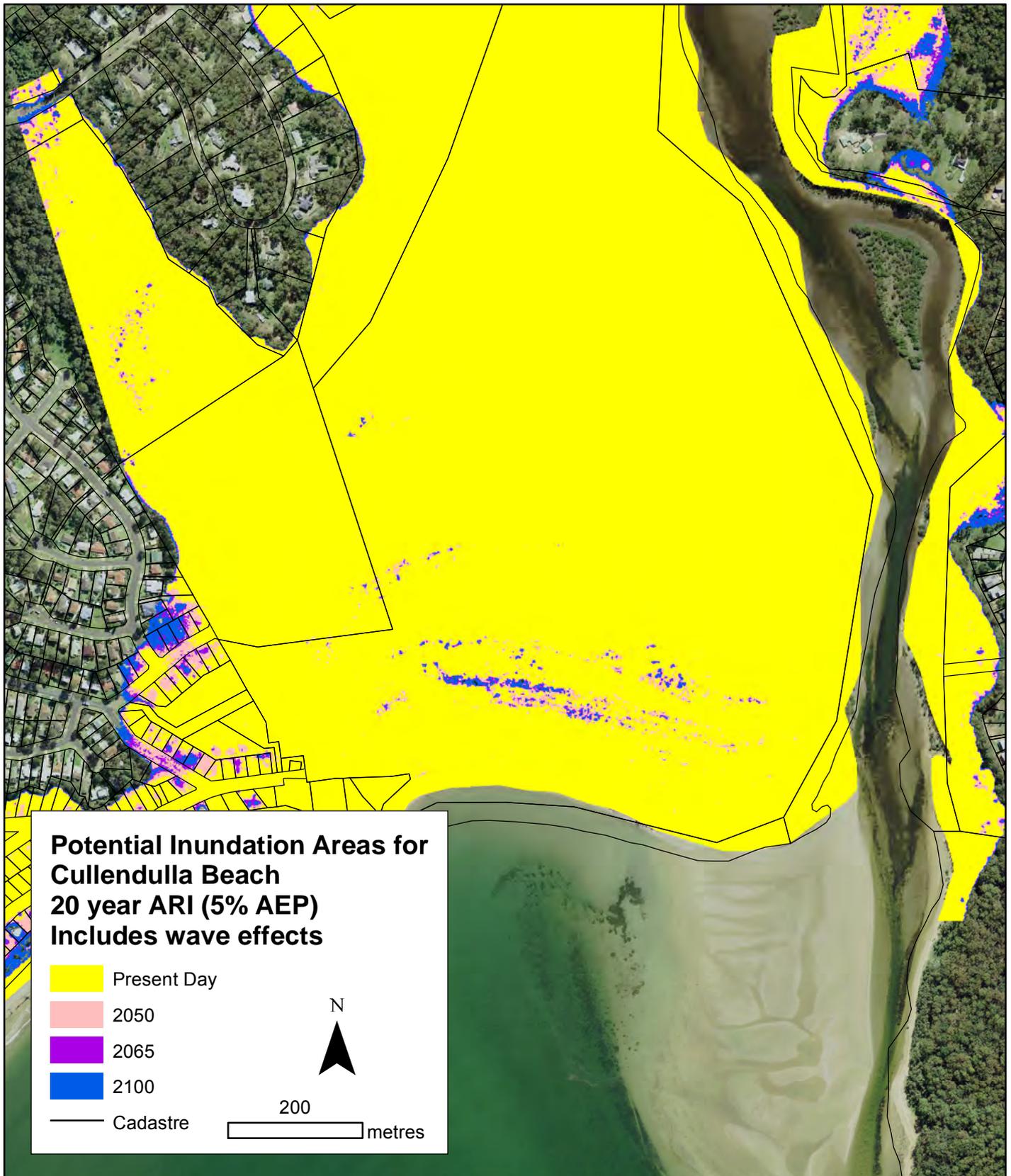
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2014) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2014 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2005). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.9**



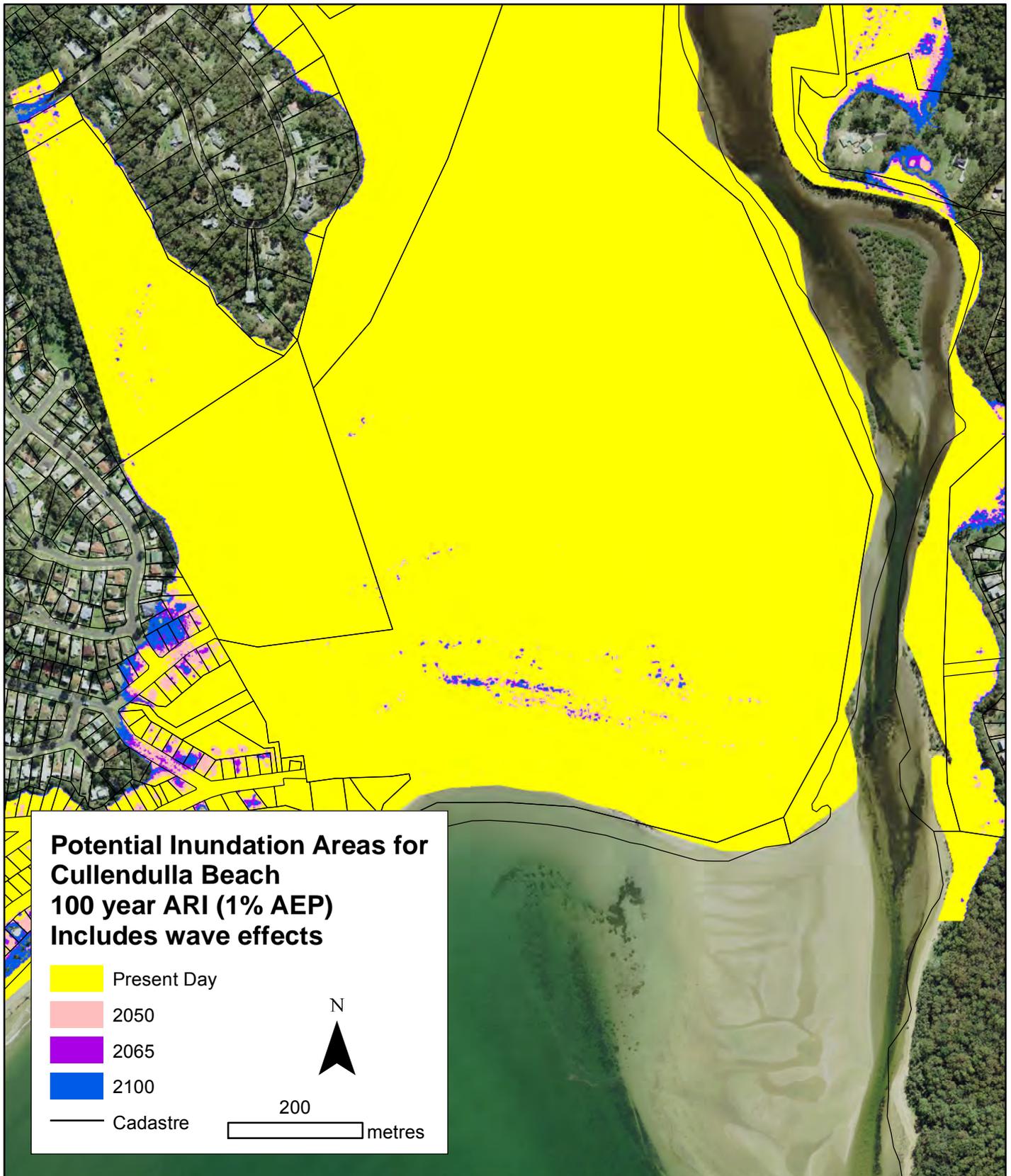
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2005) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2005 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2005). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.19**



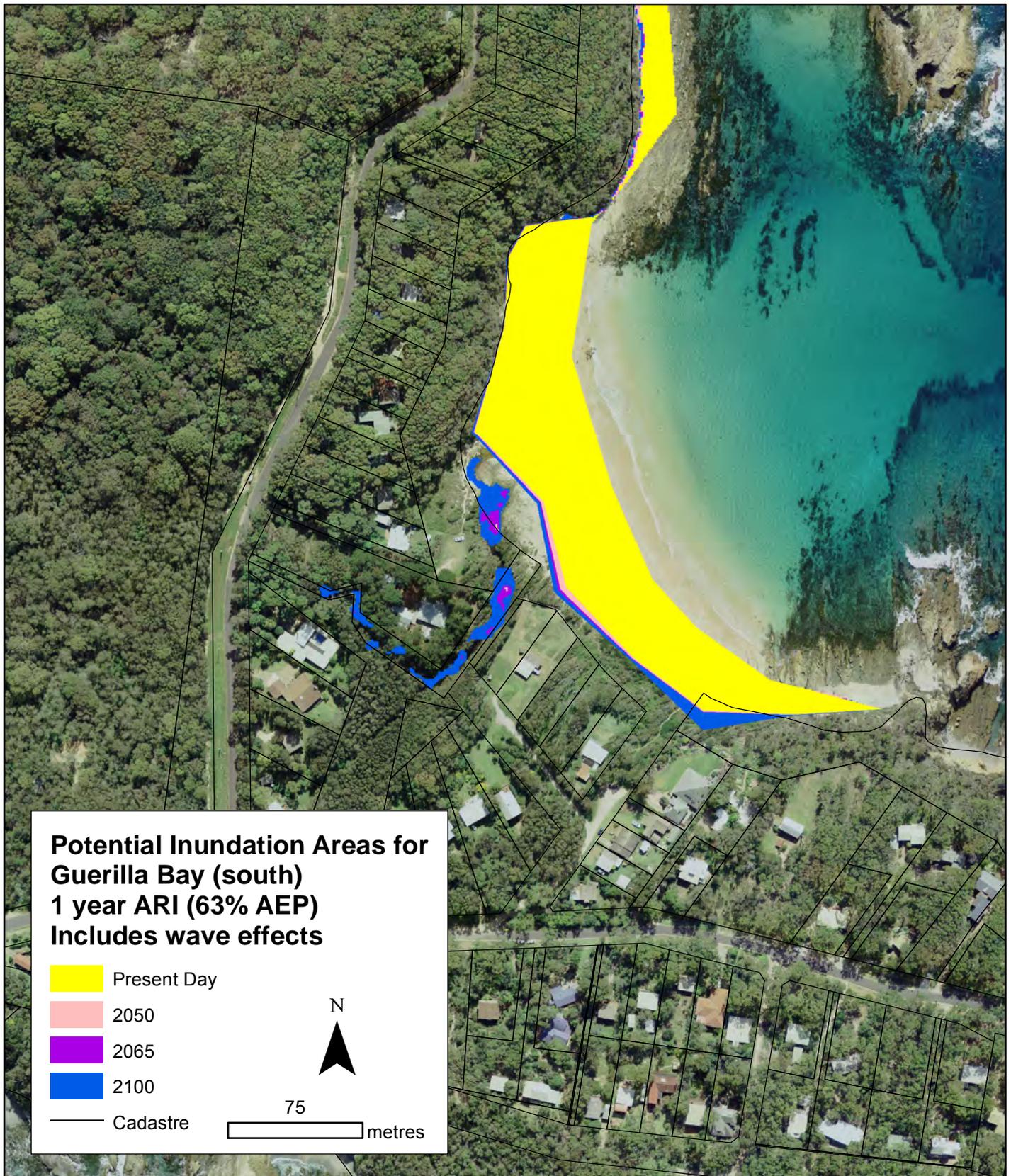
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2005) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2005 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2005). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.20**



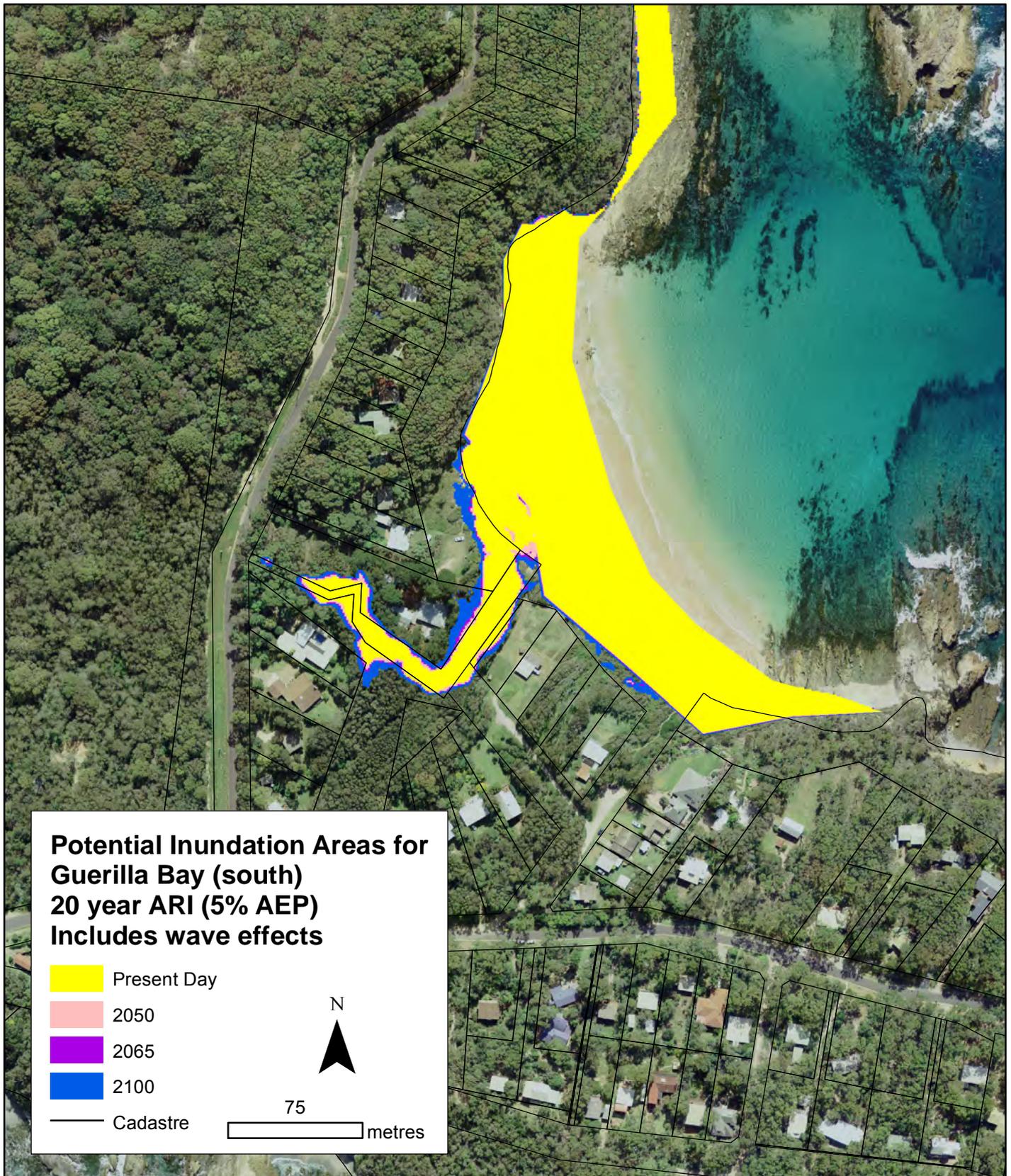
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of LIDAR data available (2005) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2005 LIDAR data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2005). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.21**



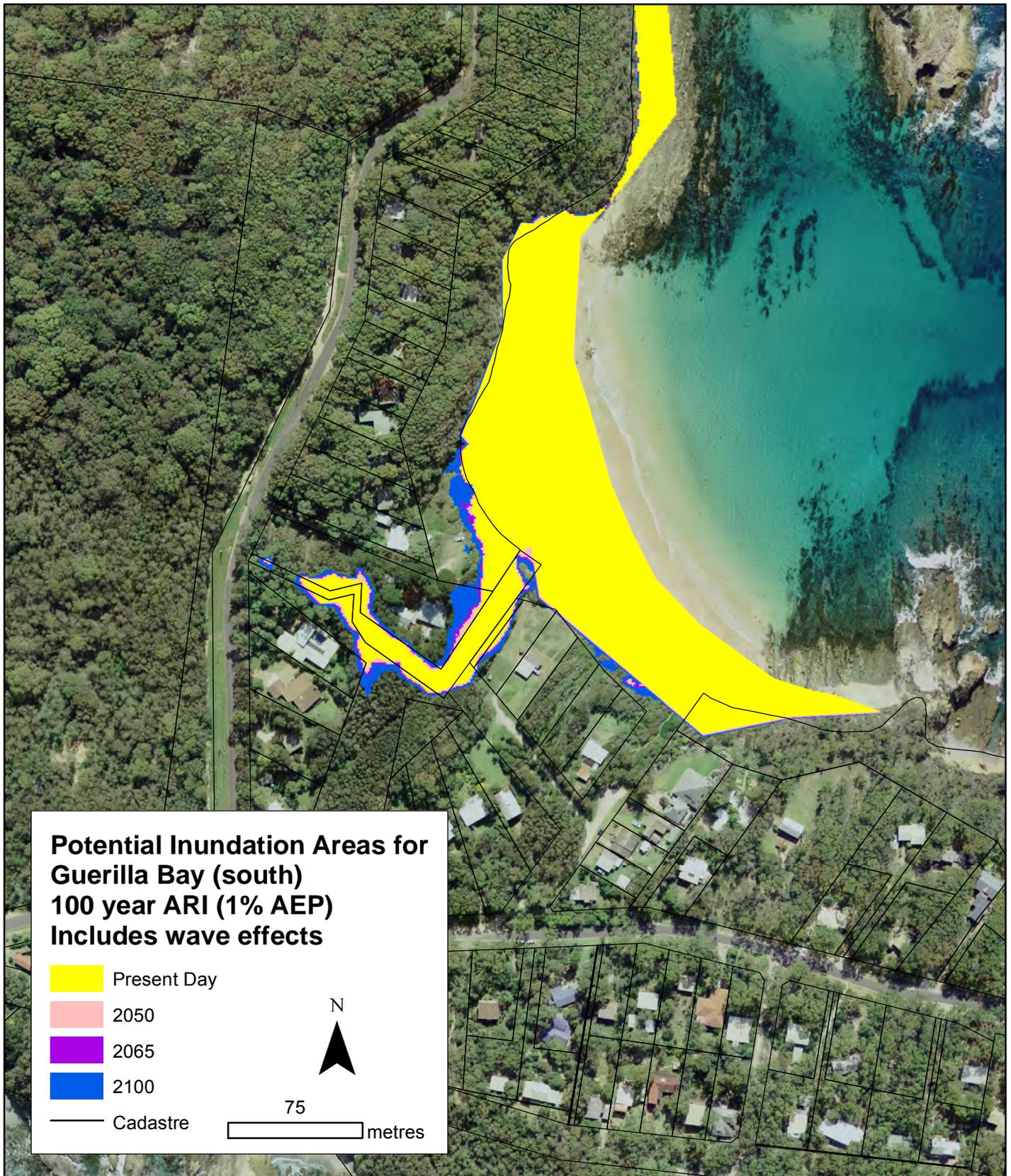
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2014) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2014 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.46**



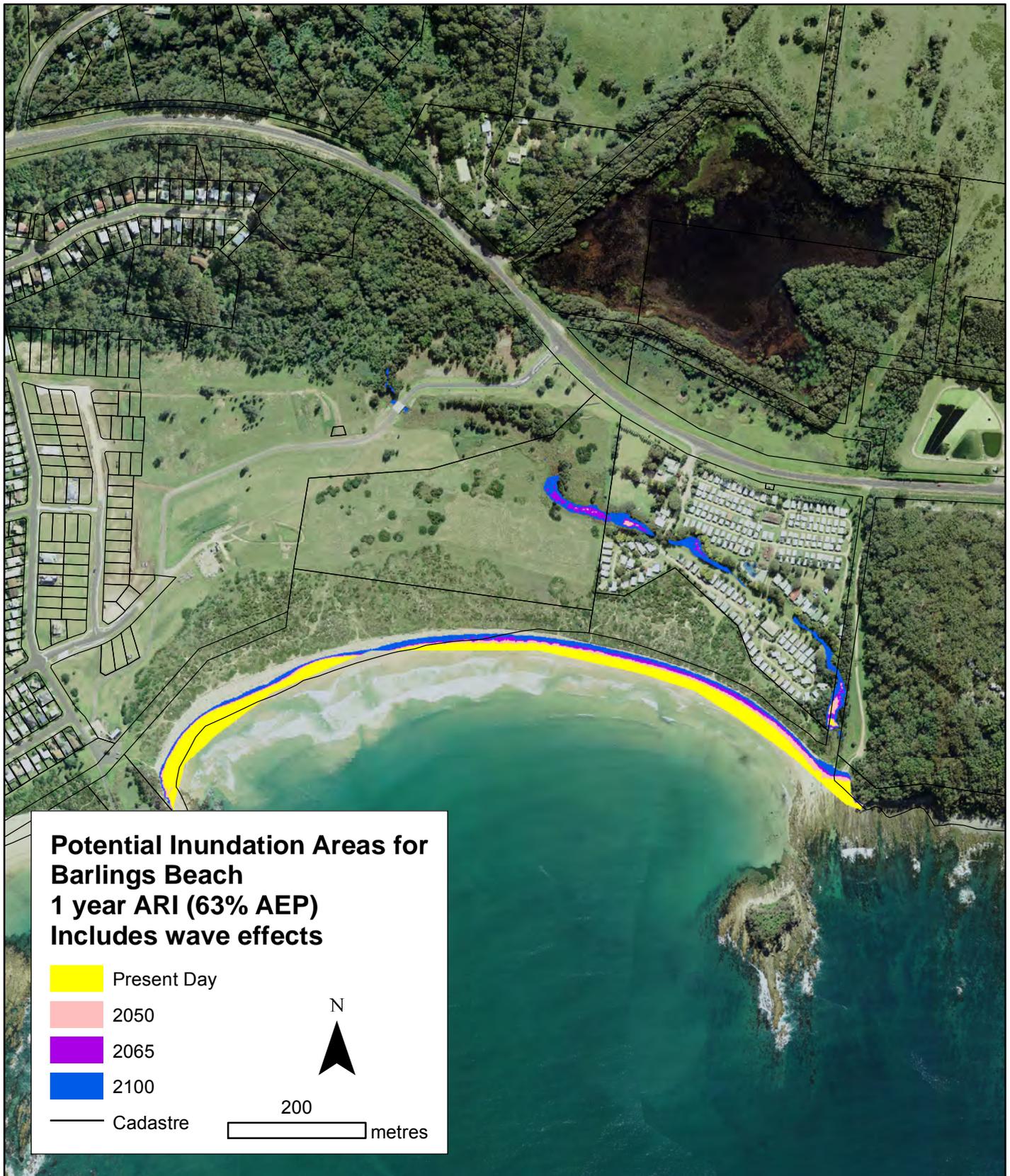
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2014) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2014 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.47**



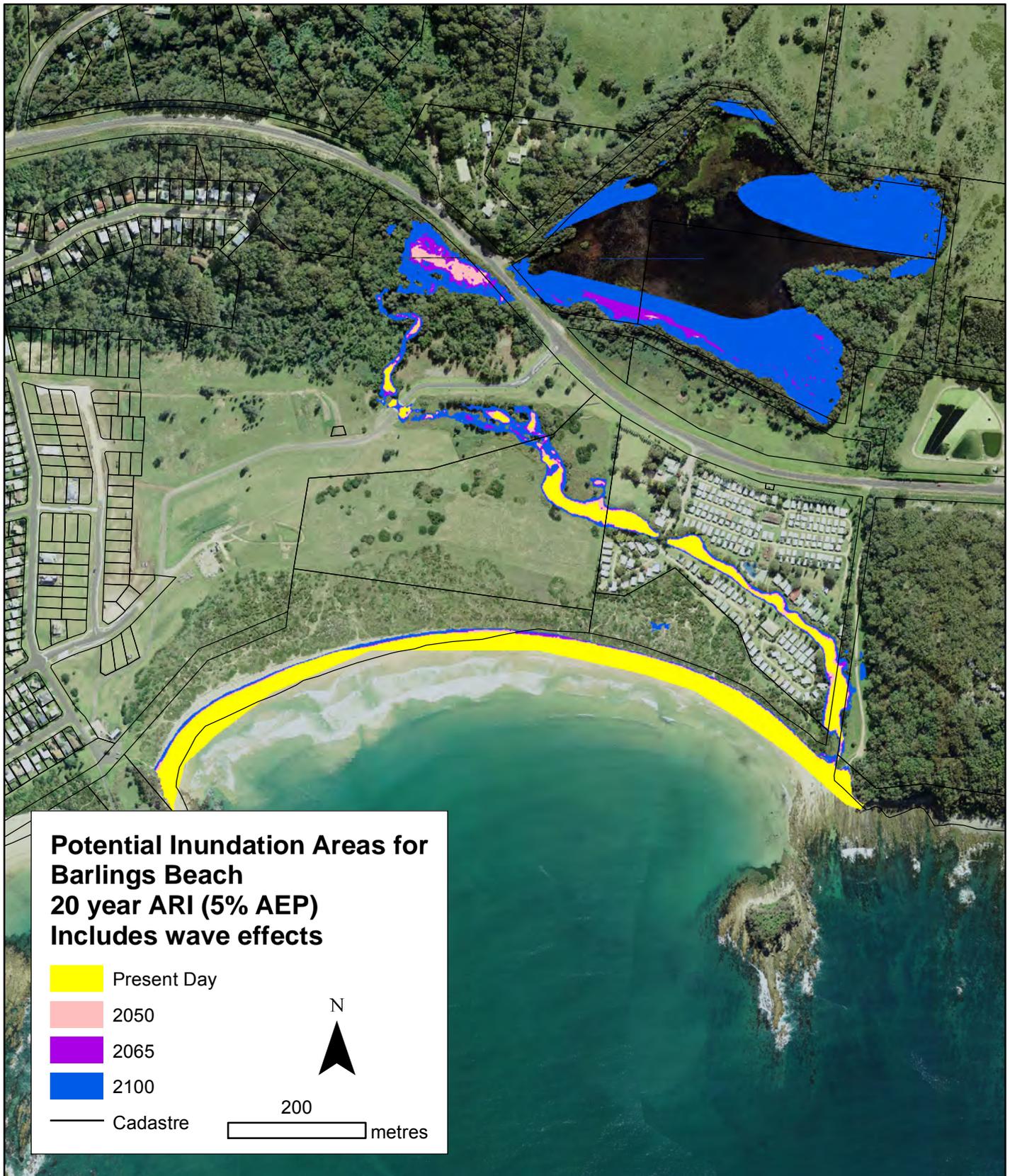
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2014) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2014 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.48**



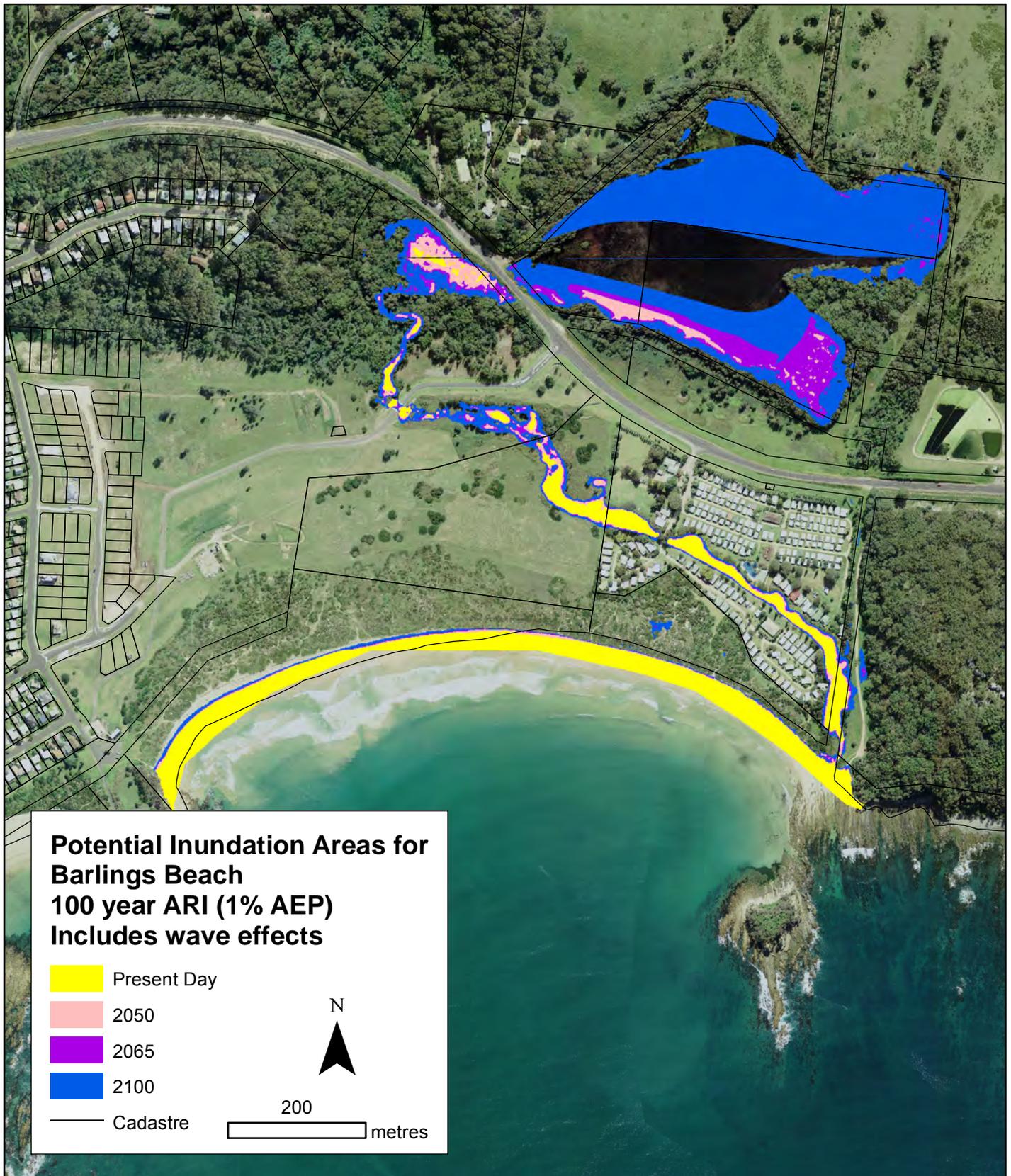
Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.49**



Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.50**



Inundation of the beachface and the area immediately landward of the dune crest is based on the most recent year of photogrammetry data available (2011) and is in accordance with ESC's sea level rise policy and planning framework. It does not include allowance for future landward recession of the beach face and assumes that the crest level of the seawall (if present) and the topography remain as they were from the 2011 photogrammetry data. By 2050, 2065 or 2100 both of these assumptions may not be valid. Should the seawall/dune be allowed to fail then the landward extent of inundation may increase. Inundation of low lying areas behind the beach is based on the most recent year of LIDAR data available (2011). The low lying inundation areas behind the beach are mapped based on the ground elevation (the "all ground" LIDAR layer) and do not consider flow paths, flow velocities, loss of flow momentum or wave propagation into creek areas. WRL is not responsible for the accuracy of the photogrammetry or LIDAR data. Local surveys by a registered surveyor are recommended to determine local inundation extents.

**Figure L.51**