

# The Moors at Arne



giving  
nature  
a home



Environment  
Agency

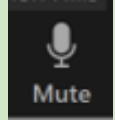
NATURAL  
ENGLAND

**Stakeholder Liaison Group Meeting: 16<sup>th</sup> September 2020**

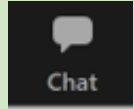
**Flood Risk**

# Welcome!

## Zoom Housekeeping.




- Please mute your microphone to avoid background noise

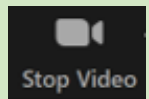


- During the presentation if you would like to ask a question please write it in the chat box

- At the end of the meeting if you would like to ask a question in the open forum, please raise your hand and we will unmute you individually so you can speak.

(In  3 dots at the bottom of the panel and raise hand.)

- There are 3 view options: full screen, speaker or gallery view you can opt to choose during the meeting. (This may be altered as the presentation is being shared but can manually be altered by each participant)



- It can be helpful to turn off your video as the presentation is shown to minimise any interruption with the internet



# Stakeholder Liaison Group Agenda

1	Introductions	5 mins
2	Review of notes from last meeting	5 mins
3	Brief project update and discussion	10 mins
4	Flood Risk Update	30 mins
5	Open Forum	25 mins
6	Next steps and date of next meeting	5 mins



# Project Update

## Work undertaken:

1. Ground investigation
2. Ecological surveys
3. Covid -19 impact



# Ground Investigation



# Ecology

- **Botanical survey**
- **Invertebrates**
- **Reptiles**
- **Phase 1 habitat survey**
- **Badgers**
- **Invasive species**
- **Bats**
- **Water voles**
- **Fish**
- **Birds**



# Project Update

## Work undertaken:

1. Ground investigation
2. Ecological surveys

## Ongoing work:

1. Continued monitoring of ground and surface water levels
2. Bathymetry survey
3. Heritage trial trenching
4. Planning application preparation including Environmental Statement (ES) and Habitats Regulation Assessment (HRA)



# The Moors at Arne



**Flood Risk Update**



# The Moors at Arne Coastal Change Flood Risk

**Flood Risk Assessment** required for Planning Application

**Statutory level** – extreme scenarios

- effect of the proposals within the site itself
- effect of the proposals on adjacent areas

**Additional work for this project** – scenarios which are not extreme but are important for neighbouring interests:

Ridge Wharf, Ridge Farm and Campsite, Ridge settlement,  
Bank Gate Cottages

# The Moors at Arne Coastal Change Flood Risk

1. Introductions
2. Modelling approach
3. Furzebrook, smaller watercourses and surface water
4. Poole Harbour & River Frome



Dr Paul Canning  
Associate Director  
Atkins Ltd



Charles Bennett  
Senior Engineer  
Atkins Ltd

# What you have told us previously

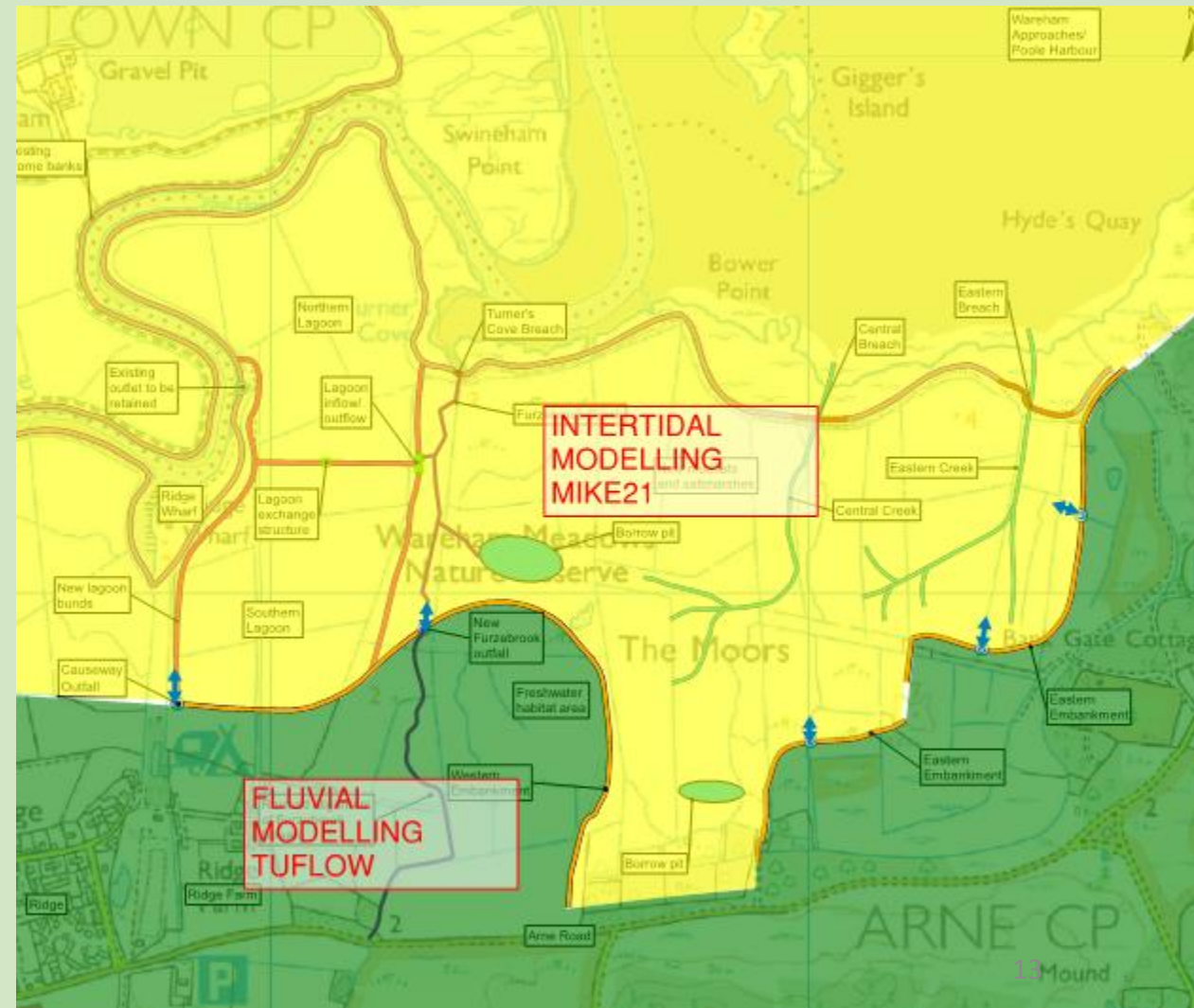
- Concerns on flood risk at Ridge
- Concerns on ditch drainage and storage in and around the Moors at Arne
- Concerns on combined flood events
- Navigation concerns on the River Frome

# Overview of findings

- Proposed scheme would not cause flood risk detriment at the community of Ridge, property at Ridge Wharf or Ridge Farm, or wider Poole Harbour
- Proposed scheme would not cause navigation detriment in River Frome

# Modelling approach

- Informing scheme development
  - Stakeholder interests
  - Flood risk assessment
  - Environmental design
- Industry standard software
  - 2D levels, flows, currents
- Topography and bathymetry (seabed)
  - Existing, with scheme
- Events modelled
  - Normal and extreme
  - Present day and year 2125



# Terminology

- A 1 in 2 year fluvial event is referred to as 'QMED'.
- A 1 in 100 event is referred to as 1% annual chance event.
- A 1 in 200 event is referred to as a 0.5% annual chance event.

# Combination of rainfall, tides and river flows

- The Moors are subject to several potential sources of flooding:
  - Extreme high tides coupled with storm surge causing coastal flooding
  - Extreme local rainfall causing high flows in Furzebrook and other small channels
  - Sustained high rainfall across Dorset causing high flows in River Frome, from runoff and groundwater
  - Sustained high rainfall locally causing saturation of ground and localised ponding

# Combination of rainfall, tides and river flows

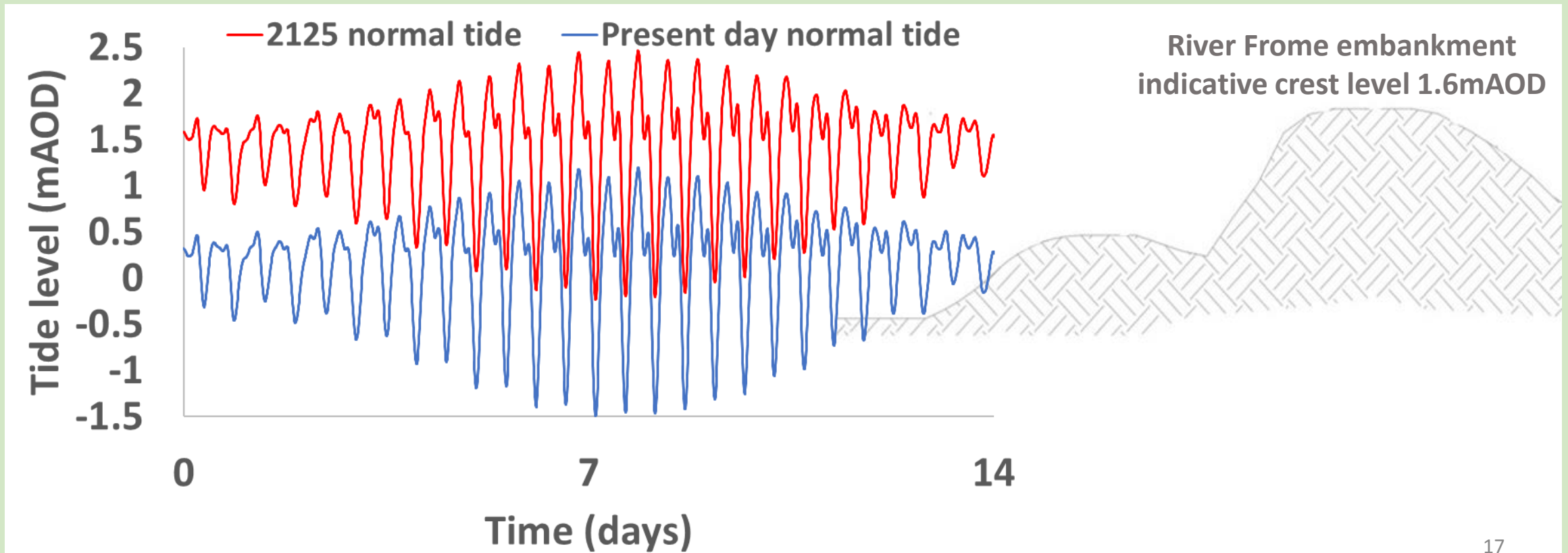
- Best practice UK guidance used
- Based on analysis of
  - 10 years of tide gauges
  - 30 years of river flow and rainfall gauges
- Fluvial and tidal events weakly dependent
  - Extreme flow (1% annual chance) with normal tide
  - Normal flow with extreme tide (0.5% annual chance)
  - Combined extreme flow and extreme tide would be greater than a 0.1% annual chance event





# Modelling inputs: climate change predictions

- Over 1.2m increase in tide level predicted by 2125 (UK government guidance)



# Modelling inputs: tides and river flows

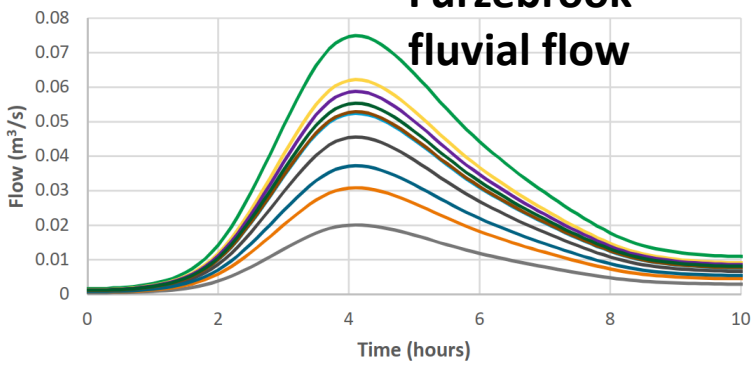


RNLI Holes Bay  
tide gauge

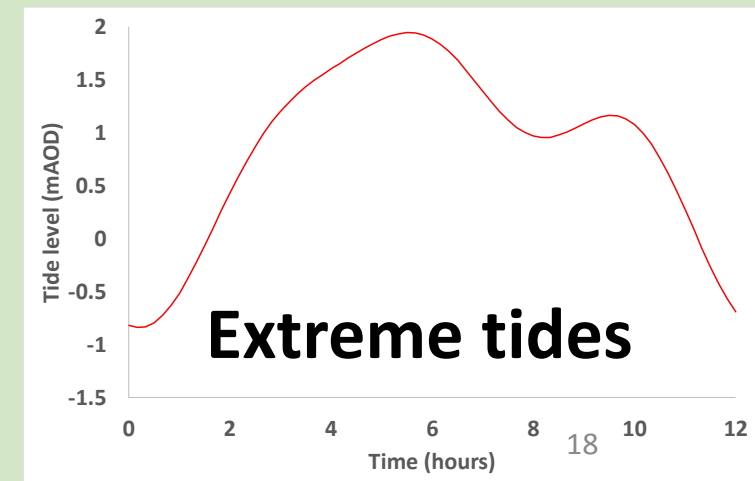
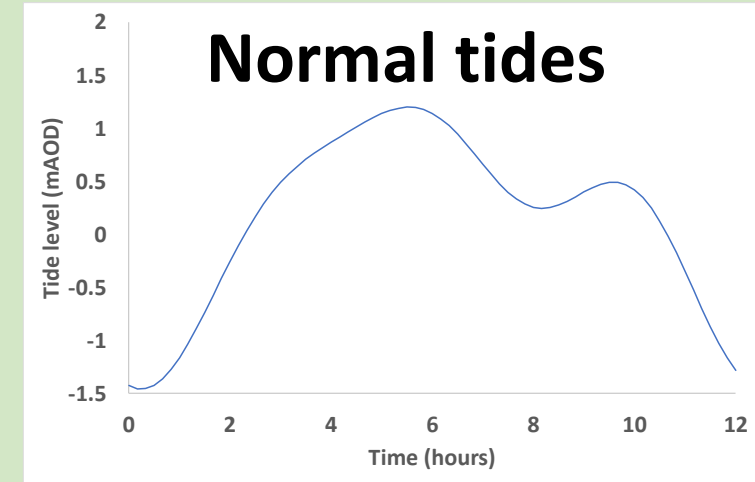
Wareham Quay  
tide gauge

River Frome  
fluvial flow

Furzebrook  
fluvial flow

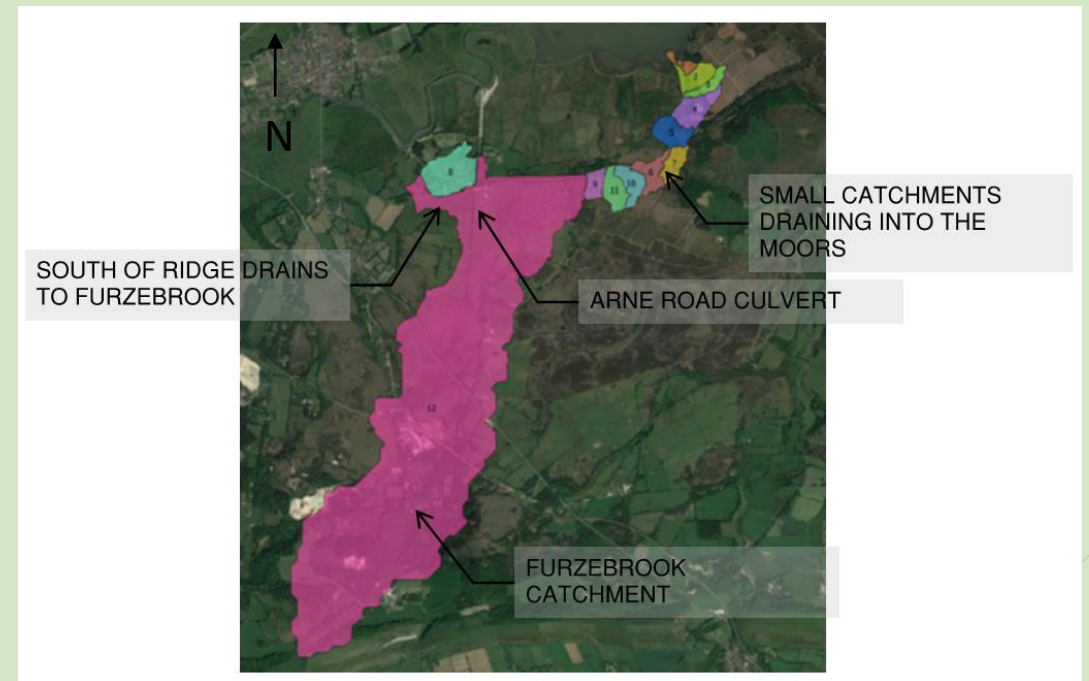
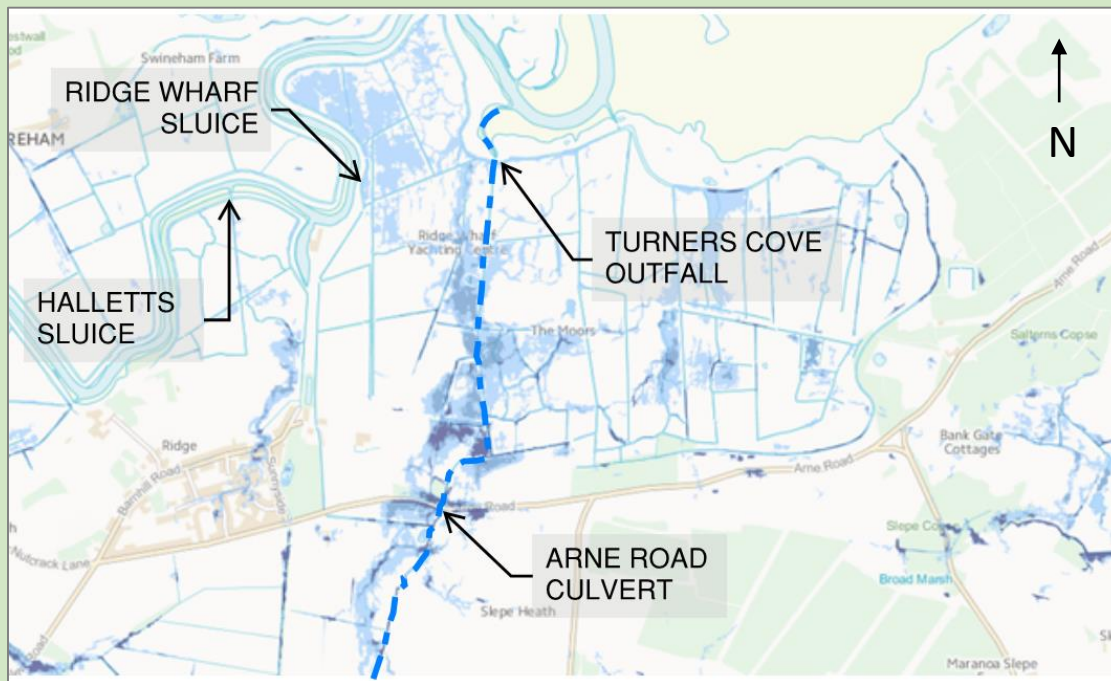


Normal and  
extreme flows

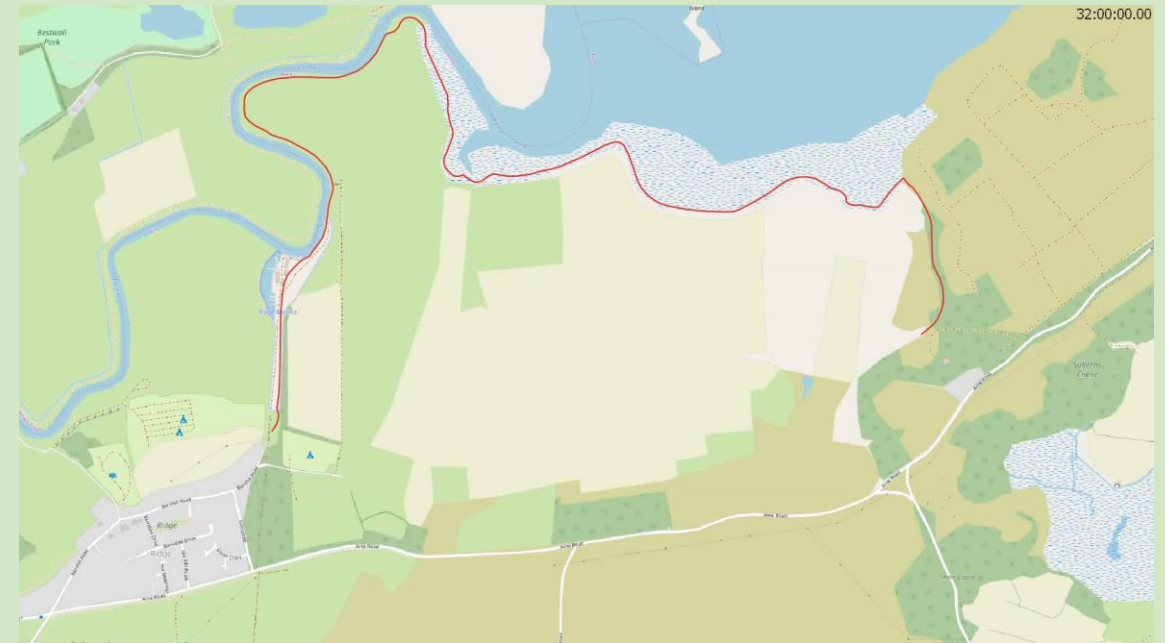
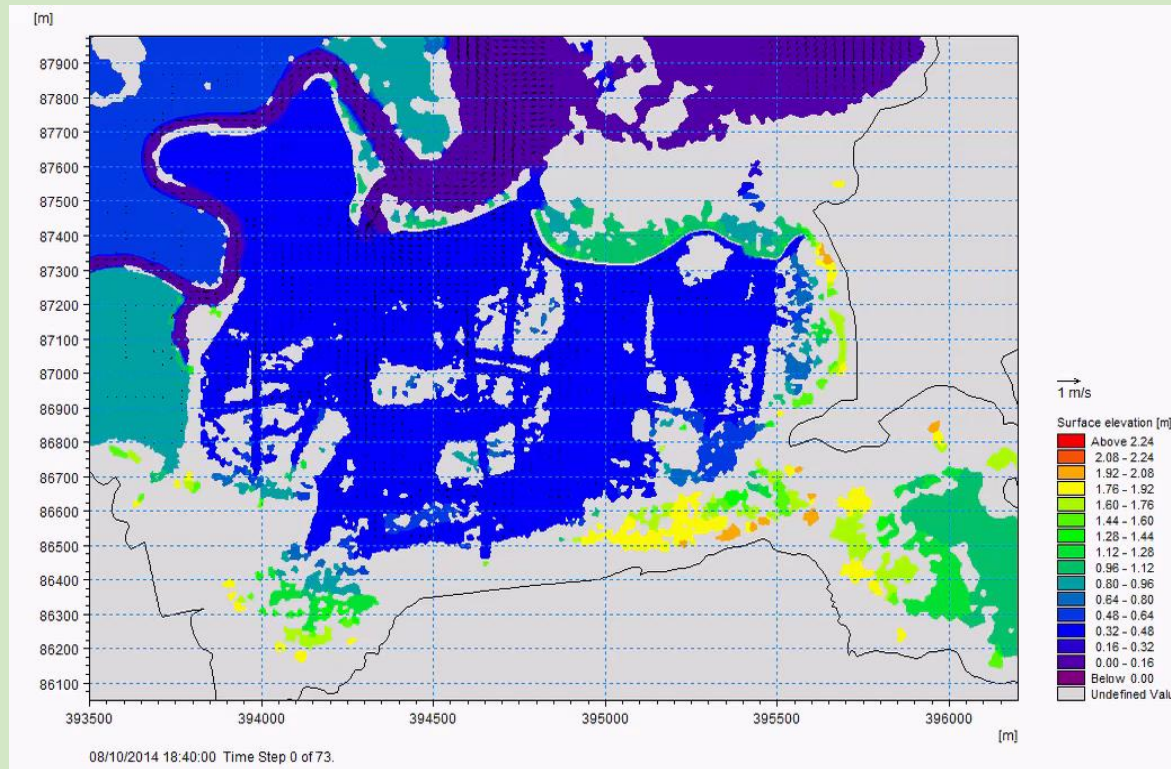


# Furzebrook, smaller watercourses and surface water

- Furzebrook Stream - small watercourse, rising on Furzebrook Heath and flowing north to outfall to Wareham Channel at Turners Cove
- Culverted under Arne Road
- New Western Embankment crosses Furzebrook and other drainage channels
- New outfalls incorporated in Western Embankment to allow flow in these channels to continue to flow into Wareham Channel and Poole Harbour
- When tide locked, flow will back up behind the new Western Embankment



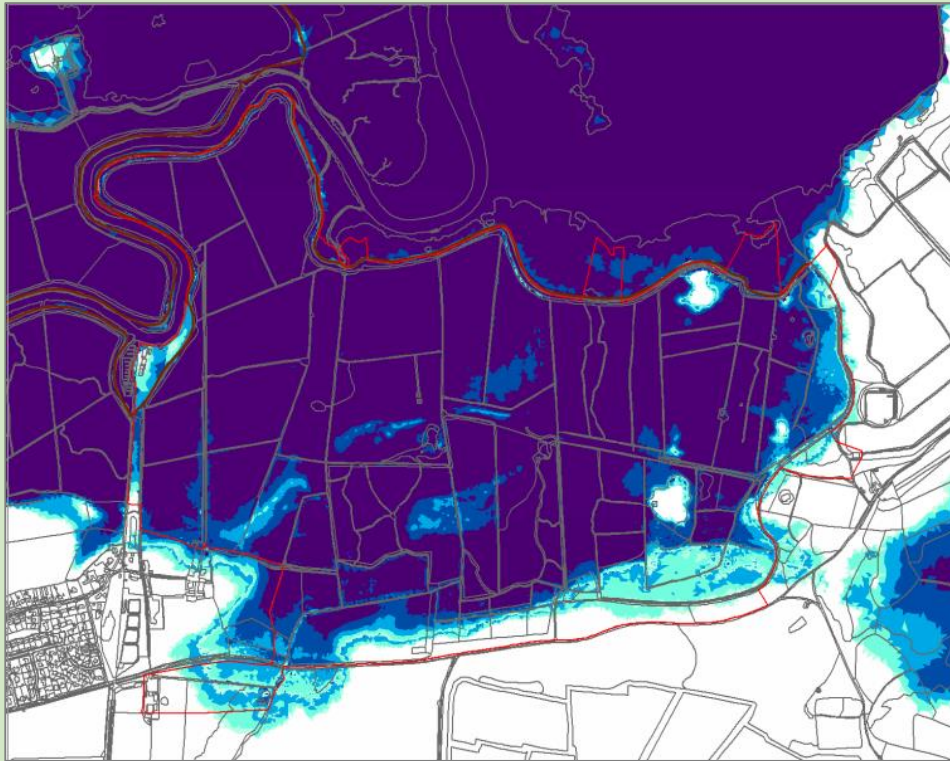
# Present-day flood risk without scheme



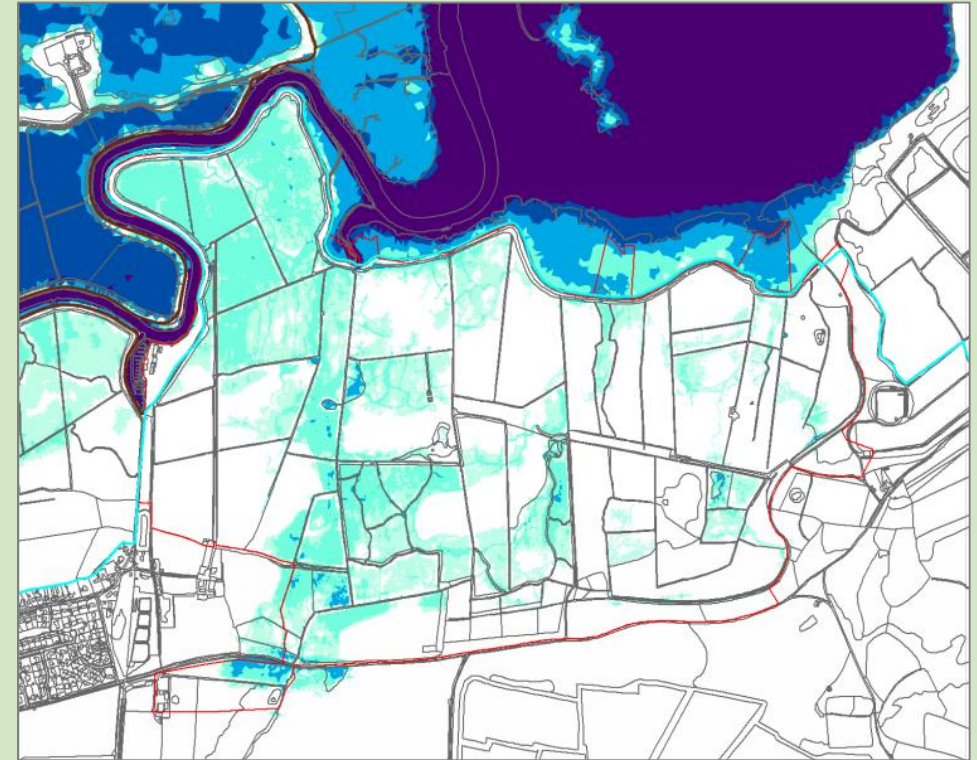
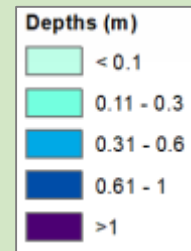
- Tide: 0.5% annual chance
- River Frome: Normal (QMED)
- Furzebrook: Normal (QMED)

- Tide: Normal (astronomic tide)
- River Frome: 1% annual chance
- Furzebrook: 1% annual chance

# Present-day flood risk without scheme

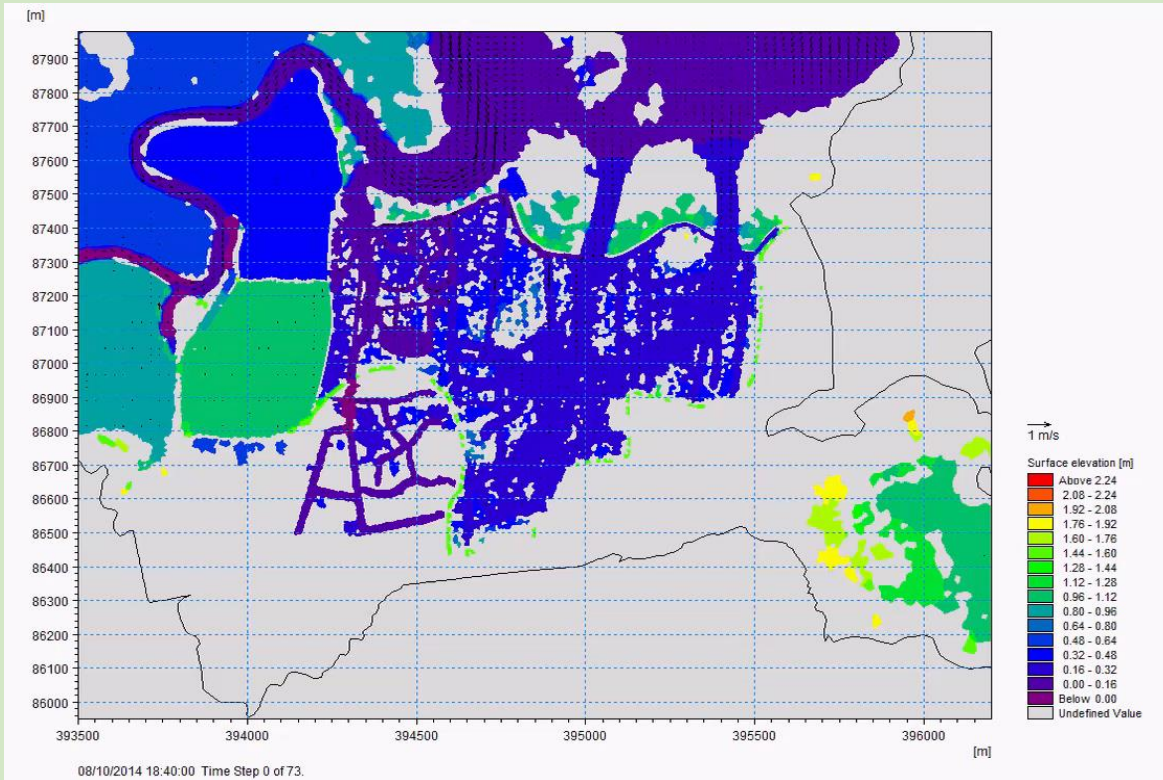


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- Tide: Normal (astronomic tide)
- River Frome: 1% annual chance
- Furzebrook: 1% annual chance

# Present-day flood risk with scheme



1012 - Present day with scheme 0.5% AEP Tidal

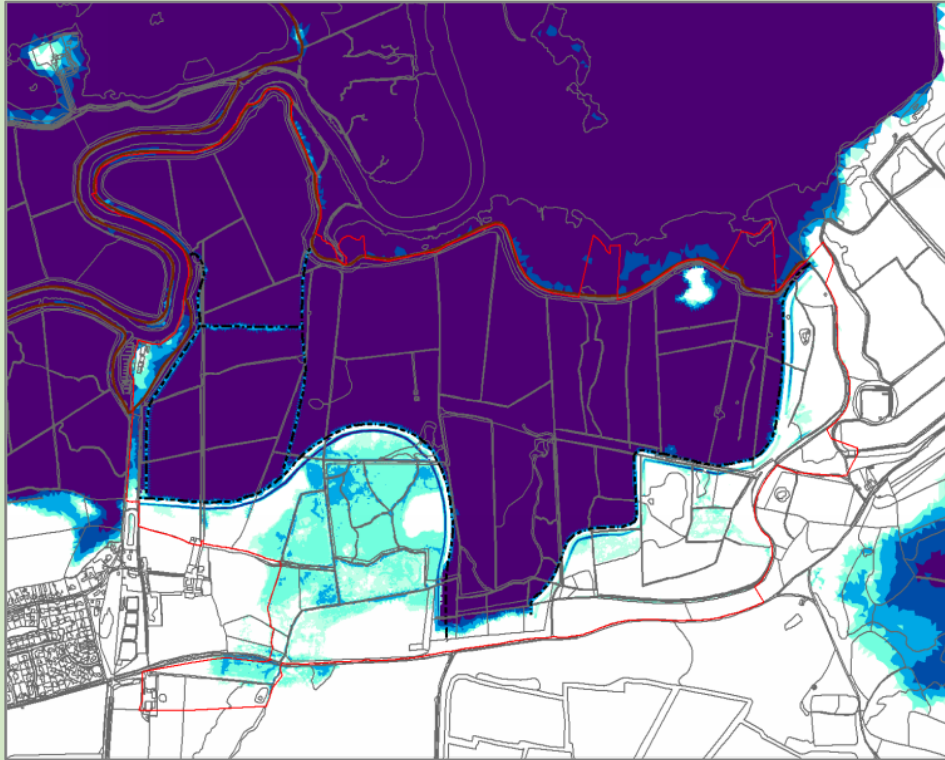
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- River Frome: Normal (QMED)
- Furzebrook: Normal (QMED)



1006 - Present day with scheme 1% AEP Fluvial

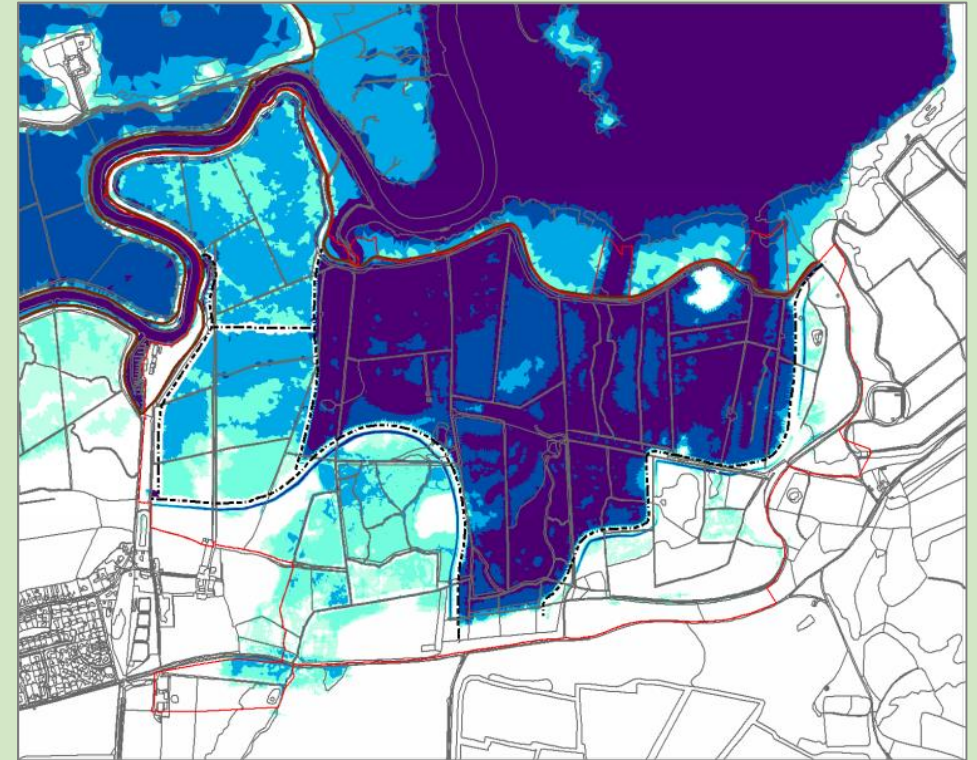
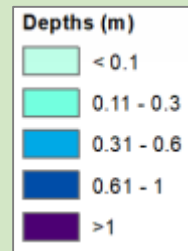
- Tide: Normal (astronomic tide)
- River Frome: 1% annual chance
- Furzebrook: 1% annual chance

# Present-day flood risk with scheme



1012 - Present day with scheme 0.5% AEP Tidal

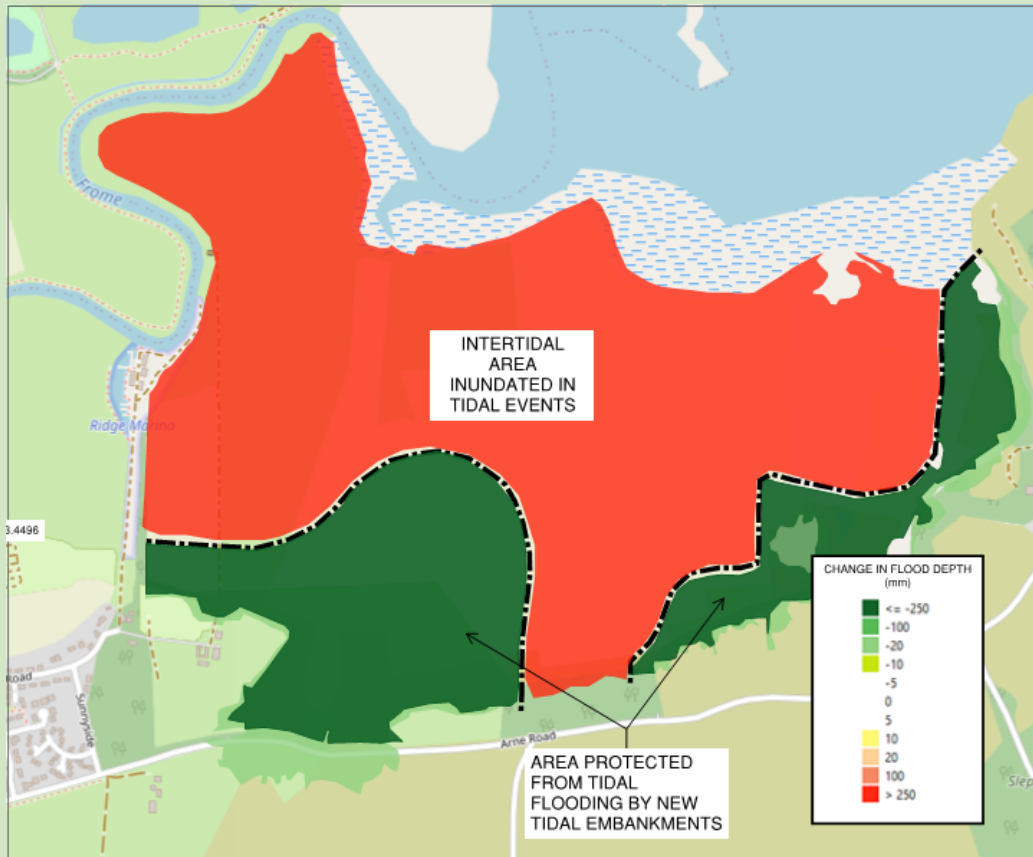
- Tide: 0.5% annual chance
- River Frome: Normal (QMED)
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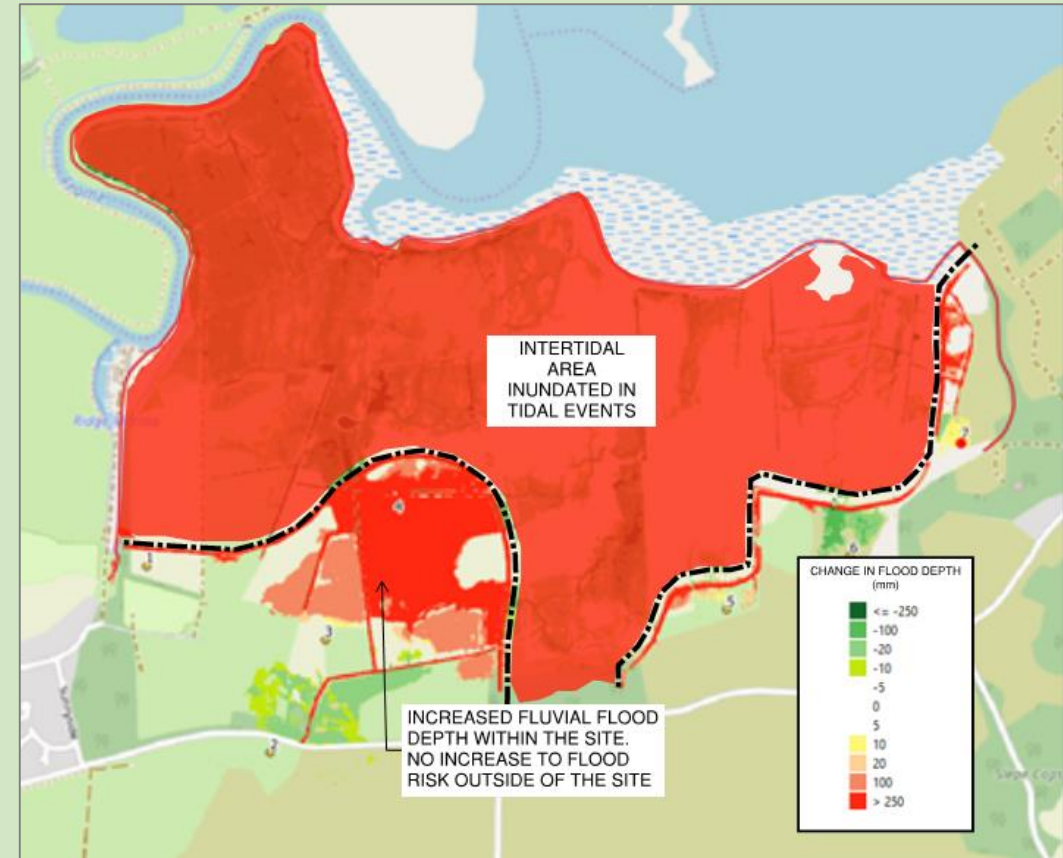
1006 - Present day with scheme 1% AEP Fluvial

- Tide: Normal (astronomic tide)
- River Frome: 1% annual chance
- Furzebrook: 1% annual chance

# Scheme impact on flood risk



- Tide: 0.5% annual chance
- River Frome & Furzebrook: Normal (Q<sub>med</sub>)
- Furzebrook: Normal (Q<sub>med</sub>)
- Decreased tidal flood depth behind embankments
- No increased risk to property outside of the scheme



- Tide: Normal (astronomic tide)
- River Frome & Furzebrook: 1% annual chance
- Increased freshwater depth behind embankments within the site.
- No increased risk to property outside of the scheme

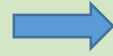


# Depth and duration

- Critical event – extreme tide with normal high flow in Furzebrook
- Tide: 0.5% AEP
- Furzebrook: QMED



At base flow, 24hrs into run



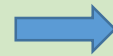
At peak flow, 29hrs into run



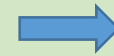
At peak flood extent, 37hrs into run



48hrs



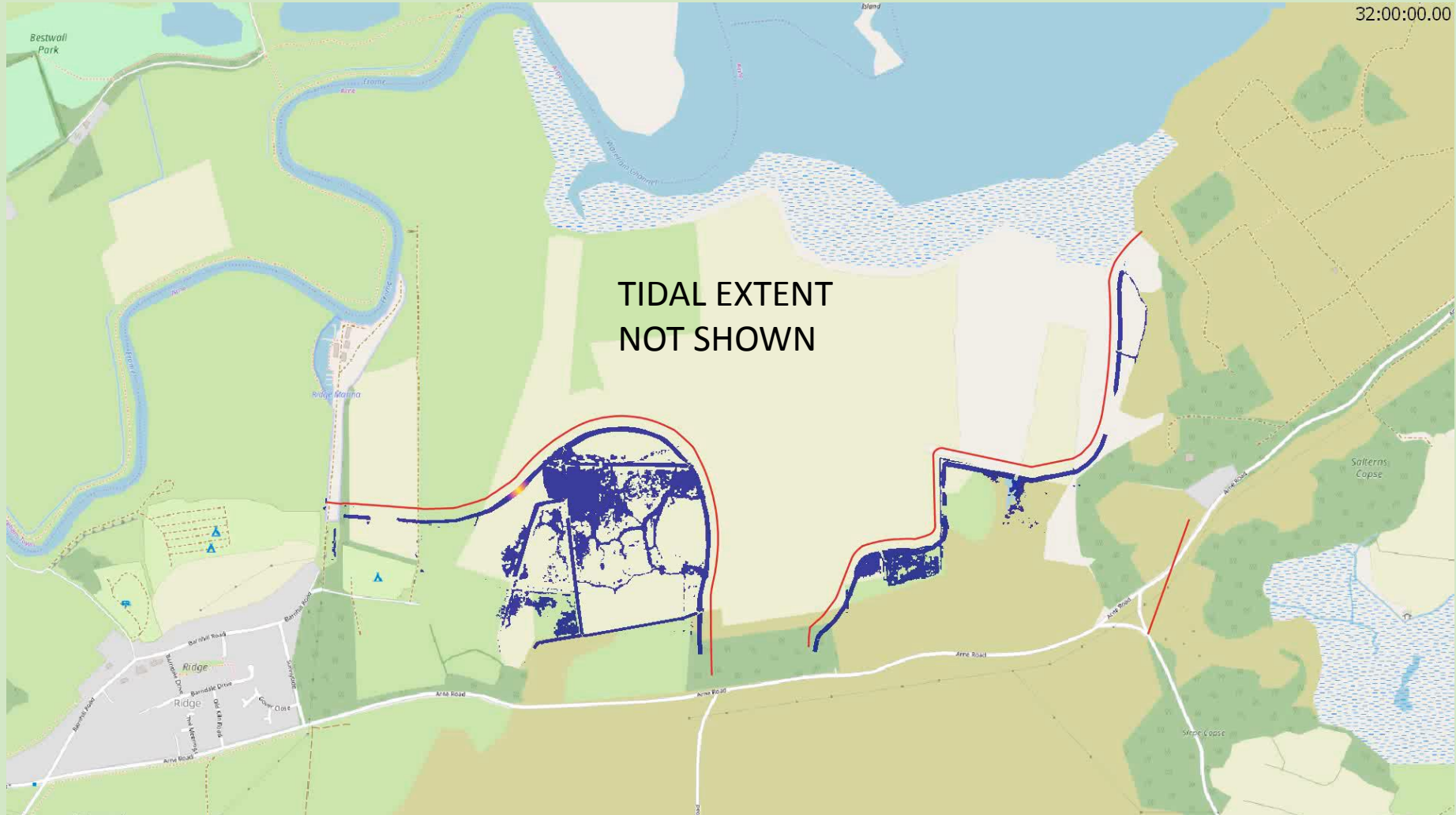
72hrs



96hrs

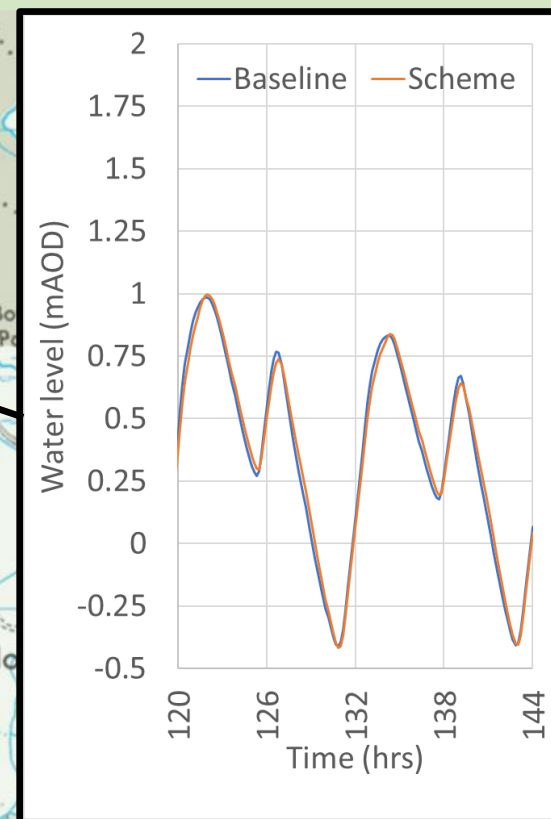
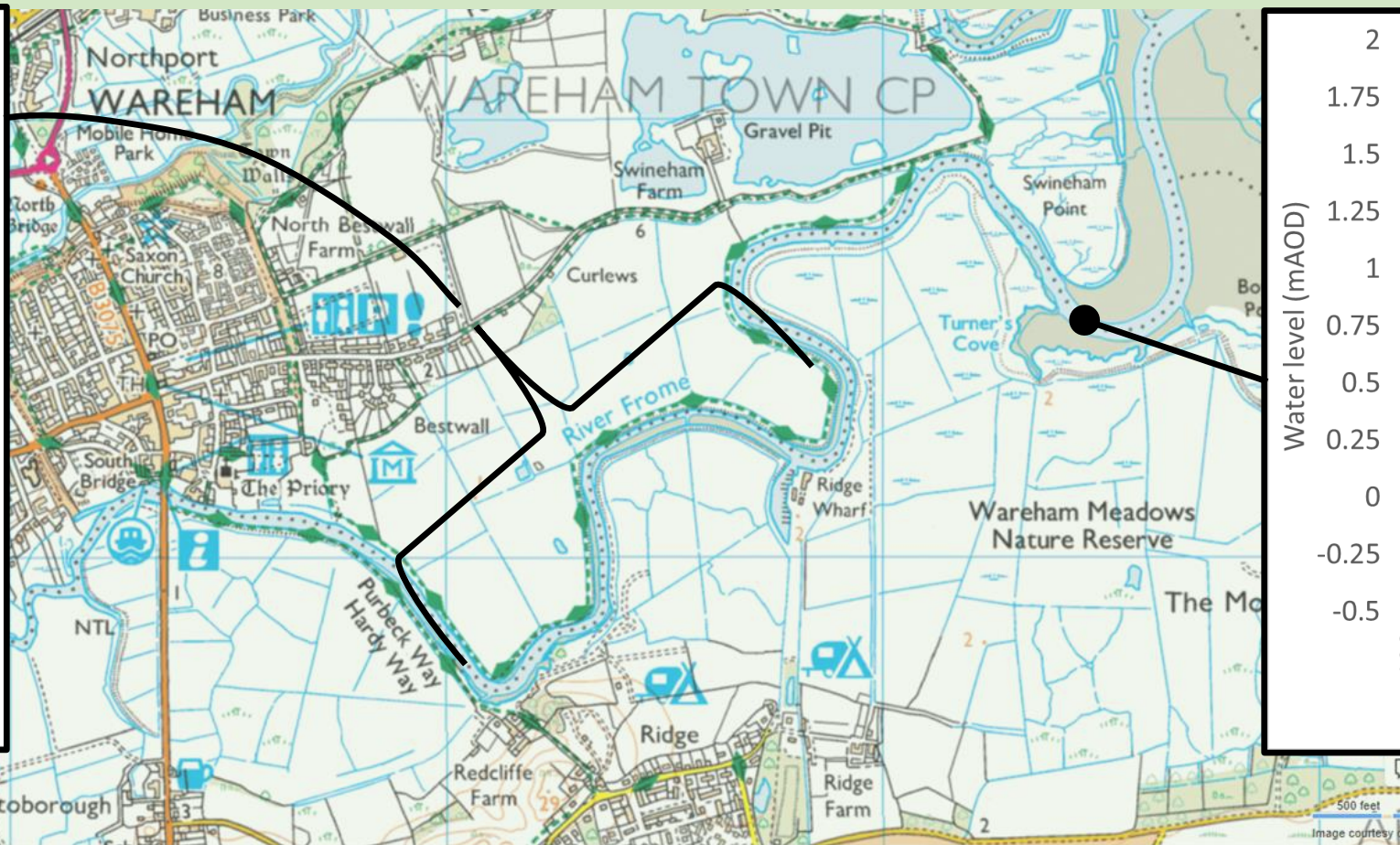
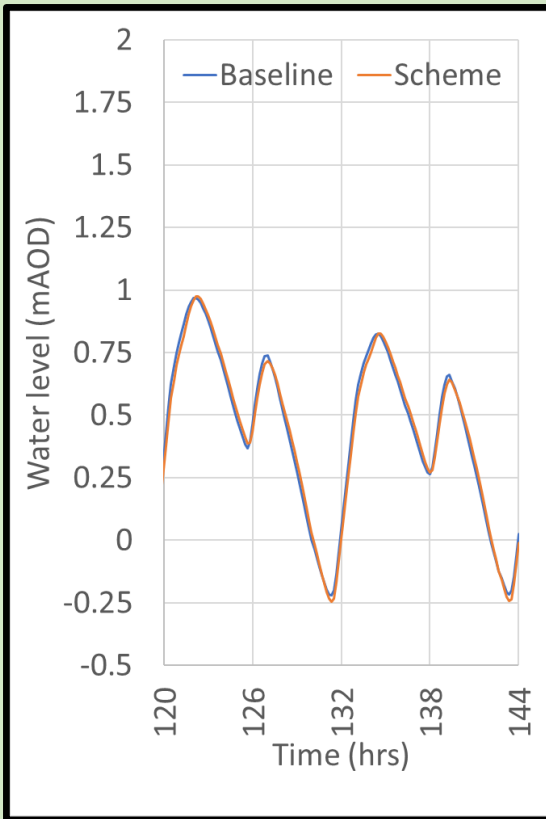
# Depth and duration

- Critical event – extreme tide with normal high flow in Furzebrook
- Tide: 0.5% AEP
- Furzebrook: QMED



# River Frome normal water levels in present day

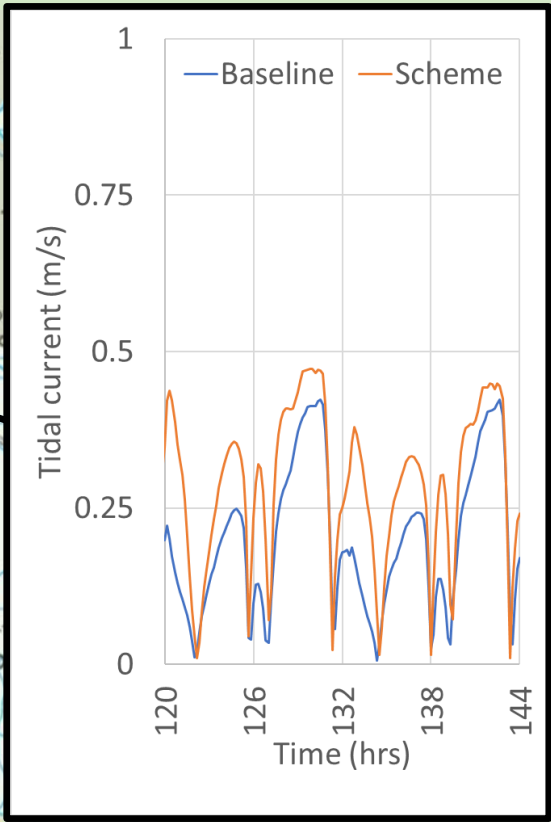
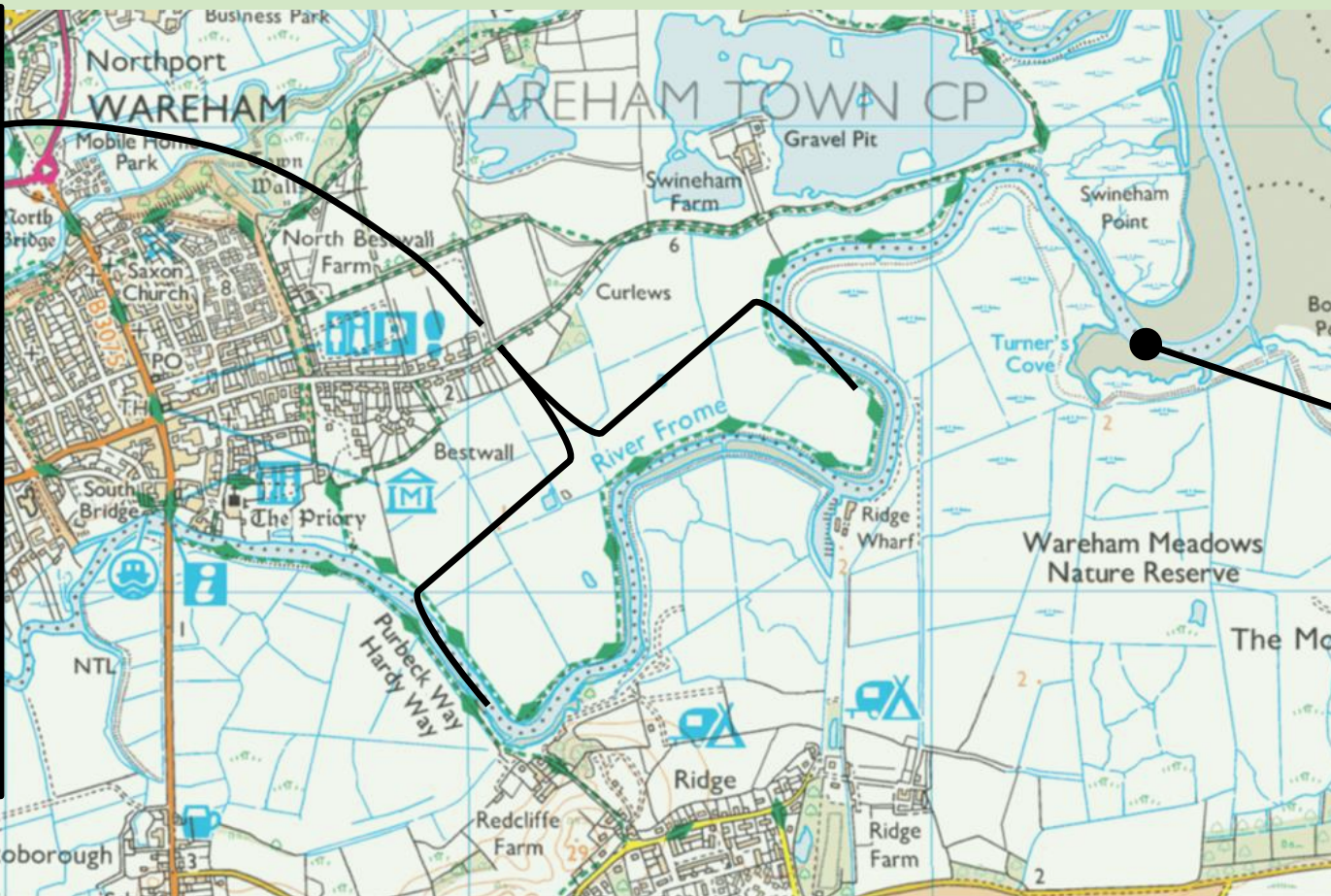
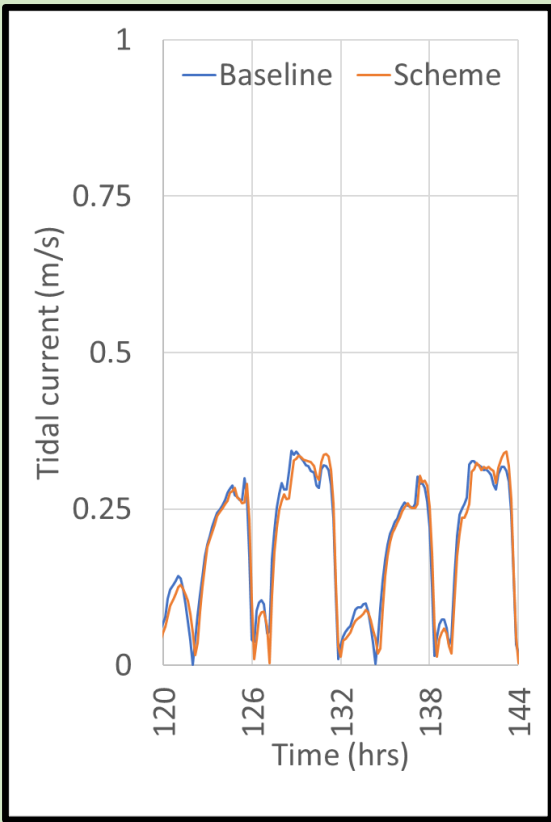
## No measurable scheme impact on River Frome tide levels



# River Frome normal water currents in present day

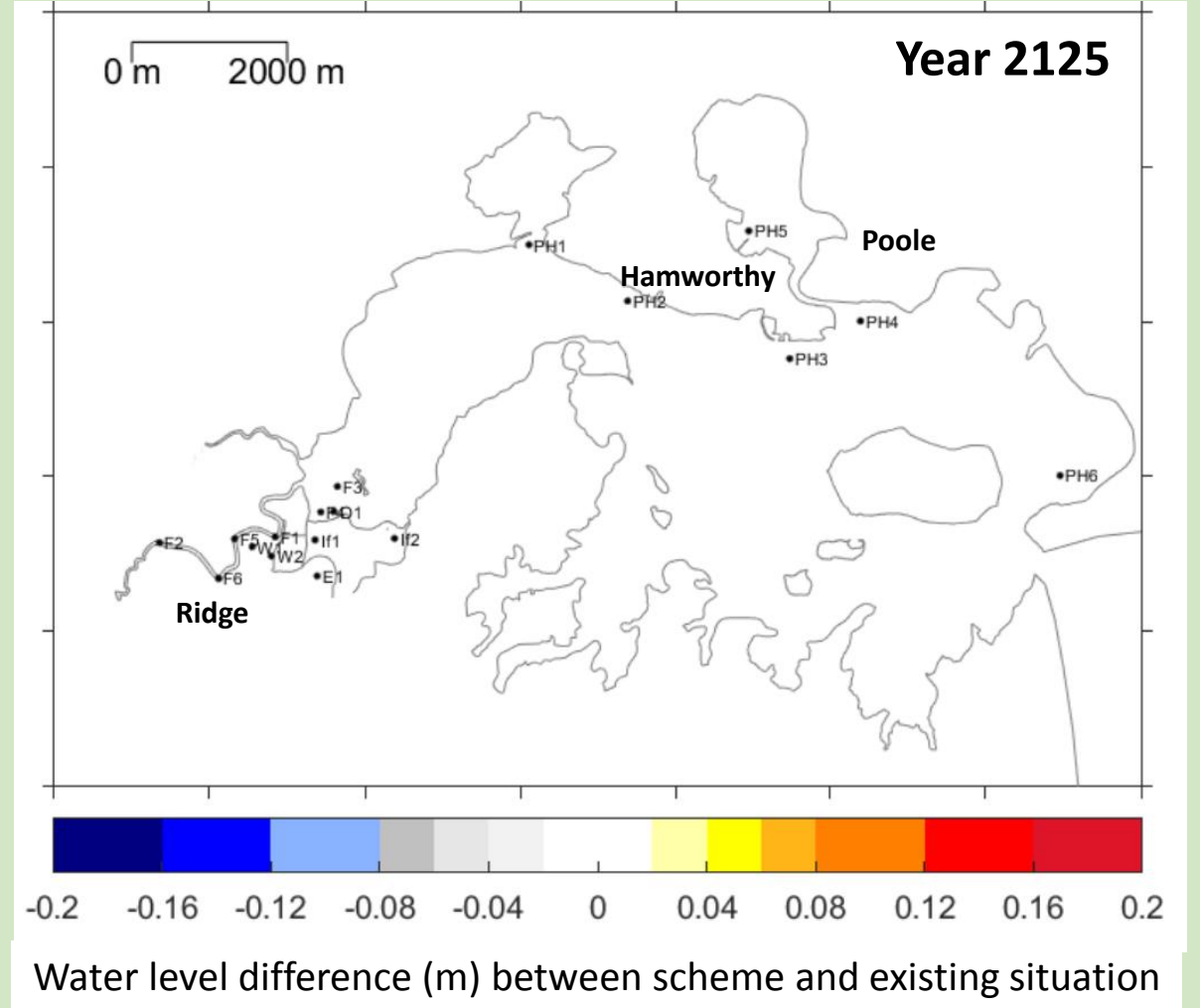
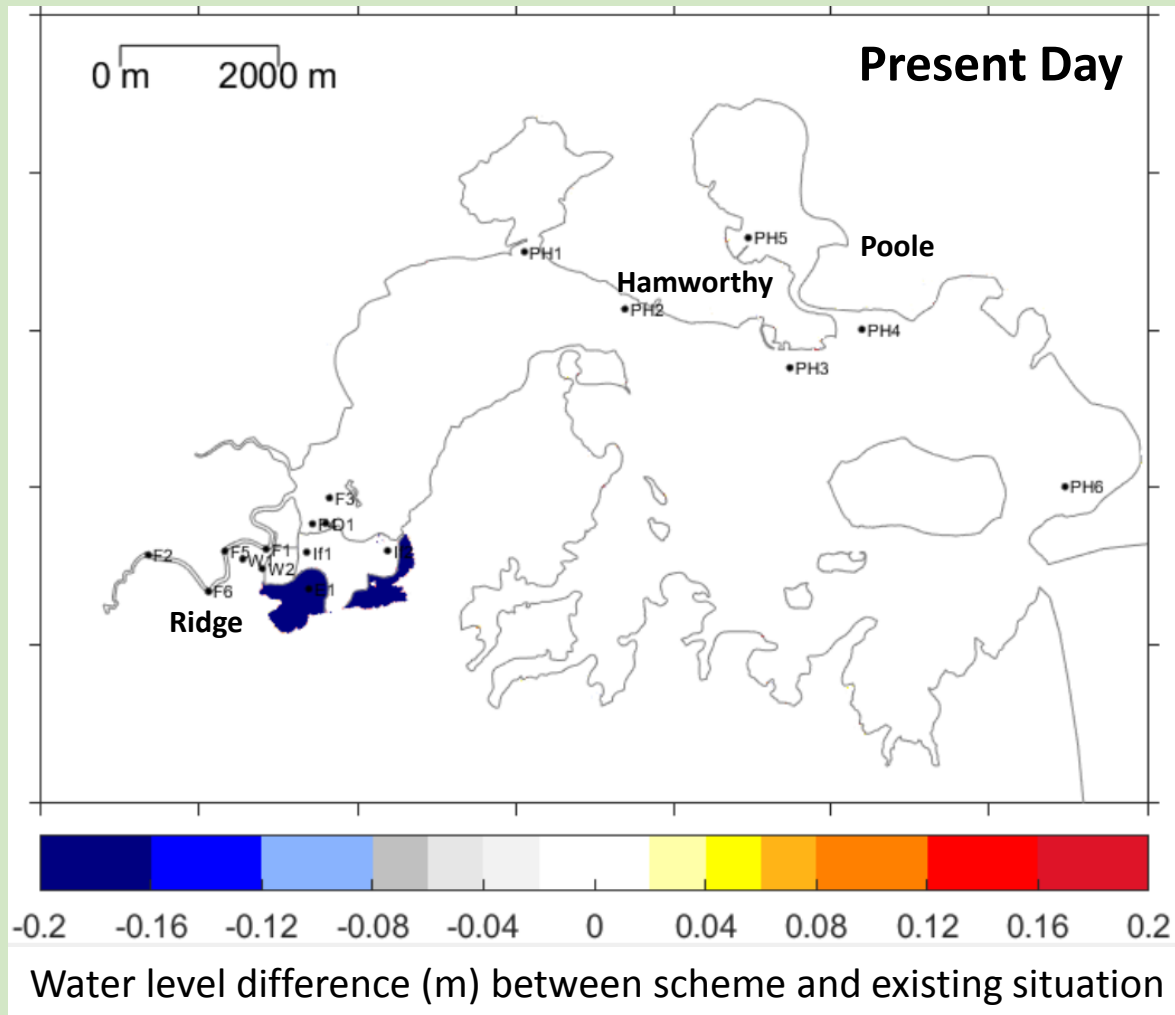
No measurable scheme impact on River Frome tidal currents

Localised change (less than 0.2m/s) to tidal currents opposite Turners Cove



# Poole Harbour extreme tides in present day and 2125

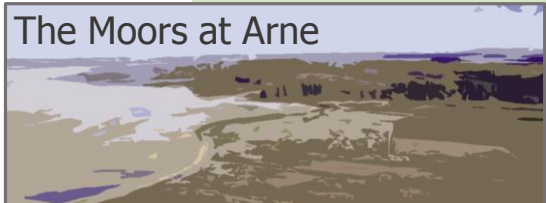
## No scheme impact on Poole Harbour and River Frome tide levels



# Conclusions

- Proposed scheme would not cause flood risk detriment at the community of Ridge, property at Ridge Wharf or Ridge Farm, or wider Poole Harbour
- Proposed scheme would not cause navigation detriment in River Frome

# Open Forum



## Next steps

### 4th November

Geomorphology / siltation

Traffic – existing situation

### Future meetings:

Traffic

Public access routes

Pre Planning meeting

The Moors at Arne

