Sheppey is a small island off the north coast of Kent at the mouth of the river Medway formed primarily of a ridge of London Clay overlain to the south by alluvium of the Medway Estuary and the Swale marshes. The recent geological development of Sheppey appears to have been largely a product of sea level change, altering the course of the local rivers (the Proto-Thames and the Proto-Medway), eroding the coastline and infilling the drowned valley between Sheppey and mainland Kent with sediment. The session will review the geology and Pleistocene history of the island and investigate landscape change caused by coastal instability and the possible consequences of future climate change.

Over time these processes have created a landscape with two contrasting environments that will need very different management strategies in the future. Along the north Sheppey coast sea level rise has, and will continue to, undercut the London Clay cliffs, particularly at Warden Point where rates of retreat average between 3-4 metres per year. While this has the benefit (for Geologists) of releasing a diverse range of quality fossils to the beach (for which Sheppey is apparently internationally renowned) the downside is a rapidly changing coastal landscape, loss of land (both agricultural and historic) and a hazard to society.

While the north coast has suffered thousands of years of coastal erosion, as sea level has risen deposition of sediment to the sheltered south of the island has led to the development of salt marshes and tidal mudflats (part of the North Kent Marshes). These sediments are up to 30 metres thick through which localised outcrops of London Clay protrude to produce low-lying landform features such as the Isle of Harty.

The question is how these processes will change the landscape in the future. Global sea levels are predicted to rise by up to 0.5 metres over the next hundred years due to climate change. Will this increase coastal erosion along the north Sheppey coast and help to support marsh accretion, or will the rate of sea level rise increase to outstrip the ability of marsh sedimentation to keep up? The consequences for Sheppey could be serious.

Recent Shoreline Management Plans (2010) argue that on the north Sheppey coast, unprotected coastal slopes are important habitats and geological exposures; therefore the long term policy is to allow natural cliff retreat with no active management. Erosion could be anything up to 300 metres by 2105. Where sea defences are in place the coastal zone may narrow but the intention to hold-the-line may be a little ambitious, since it will potentially require defences along the whole of the southern margin of Sheppey. If the southern marshes are exposed to flooding one of two things may happen. If the marsh is supplied with sufficient quantities of fine-grained sediment, it could potentially accrete vertically and Sheppey may not change drastically. However, if accretion does not take place and large parts of the North Kent marshes are flooded, Sheppey could become a more isolated island approximately 7km off the north Kent coast.