



Department  
for Environment  
Food & Rural Affairs



Department for  
Business, Energy  
& Industrial Strategy

 **Met Office**  
Hadley Centre



**Environment  
Agency**

## UKCP18 – Climate impacts narratives

This set of climate impact narratives has been developed to accompany the [UKCP18 User needs for derived products document](#).

The narratives have been developed with subject experts and set out what climate impacts information is needed to enable adaptation, and how this may be derived from UKCP18.

Please explore the [individual narratives and accompanying roadmaps](#) when considering your own research, product development and funding opportunities.

You can also [register](#) for further updates about the UKCP18 project.

# Narratives and Roadmaps

**Air quality**

**Coastal erosion**

**Drought**

**Flood risk**

**Health and  
temperature**

**Landslides**

**River erosion and  
bed scour**

**River flows and  
levels**

**Soil moisture  
deficit**

# Air quality

## What people want

- To better understand the relationship between climate and air quality
- Information on the frequency of weather events that affect air quality
- Common metrics for air quality and climate change impact assessments

## What already exists

- Short-term (five day long) forecasts of air quality
- Tools for medium to long-term climate change and air quality interaction
- Active research by academics, commercial consultants and public sector organisations e.g. the RIDE air quality and climate change working group

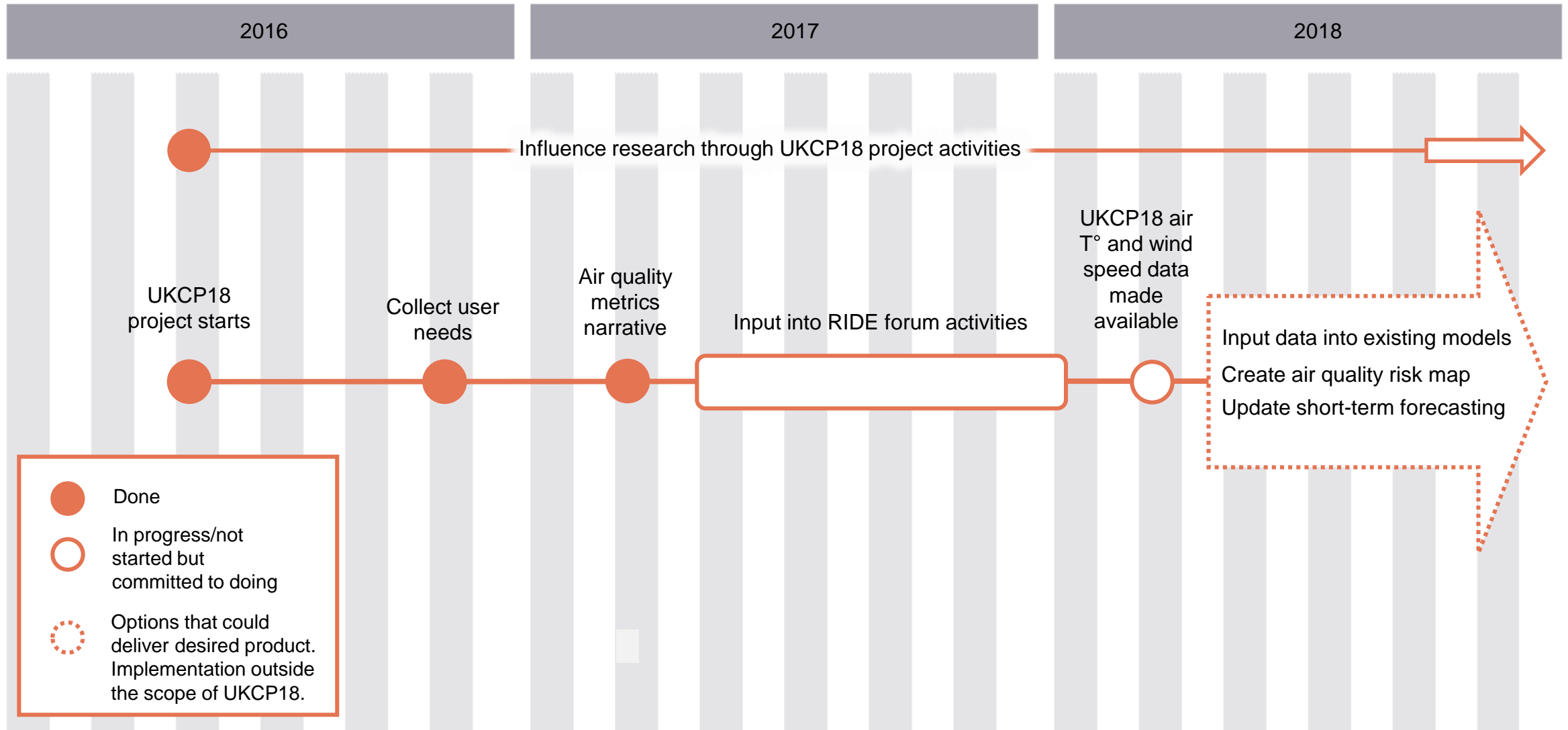
## What needs to be done

- Establish the most potent or high-risk pollutants
- Establish the UKCP18 outputs needed to derive air quality metrics
- Develop common metrics for air quality and climate change assessments
- Explore the relationship between air quality and climate

## Next steps

- Highlight research gaps and opportunities to utilise UKCP18 in ongoing and planned research projects

## Air quality information and product requirements - Roadmap



# Coastal erosion

## What people want

- Maps of future coastal erosion risk and extent for the UK
- Data on location and condition of existing flood defences
- To understand how changes in coastal erosion risk could impact on flood defences and infrastructure

## What already exists

- National quantitative assessments of present coastal erosion risk
- Interactive maps of future coastal erosion extent for some areas
- Case studies of coastal erosion for specific locations
- Shoreline management plans
- Current research on shore and cliff erosion

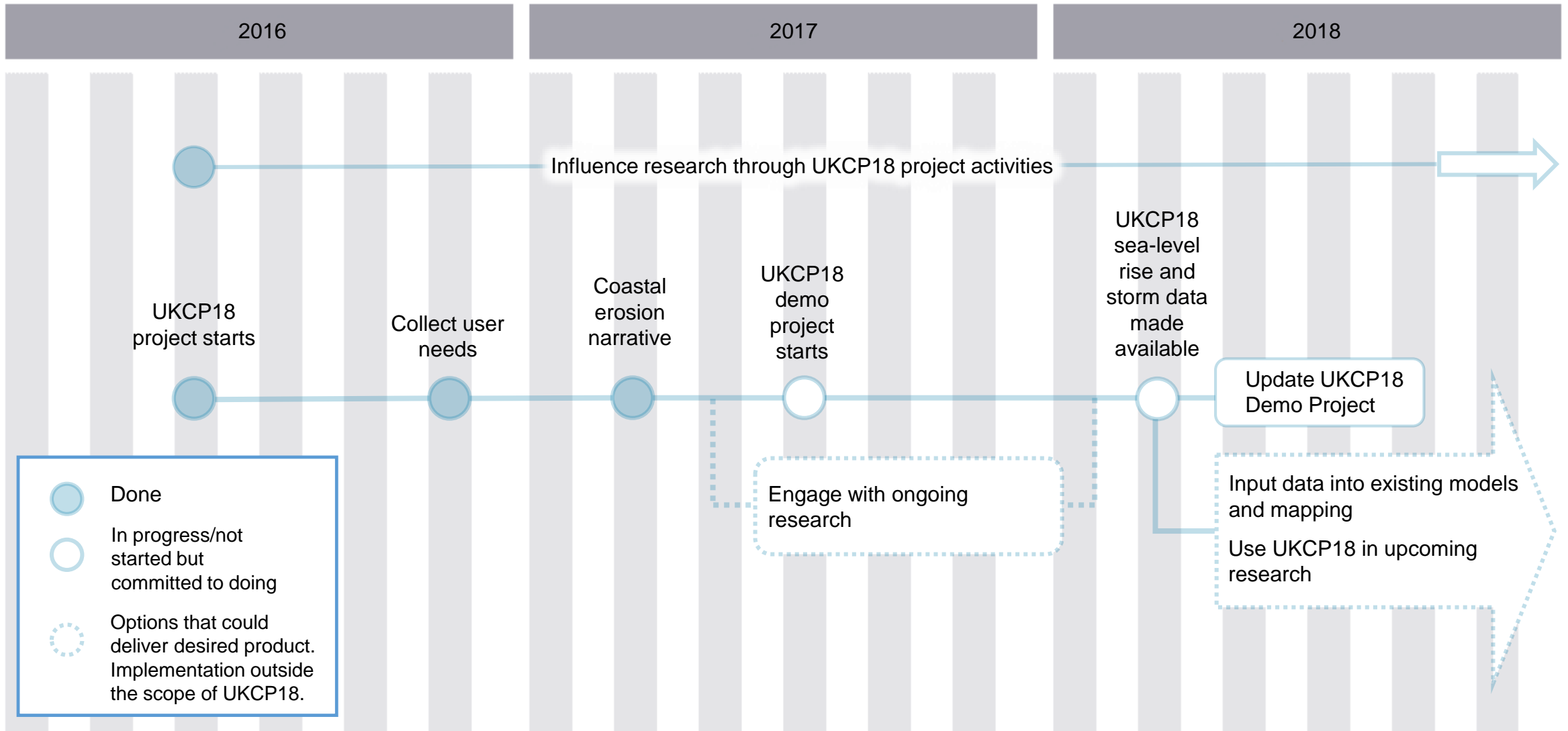
## What needs to be done

- Translate UKCP18 outputs for coastal erosion risk
- Review whether existing products should be updated using UKCP18
- Create new products that link changing risk to impact
- Share good practise through case studies

## Next steps

- A knowledge exchange event between lead organisations
- Update existing products with UKCP18 data where appropriate

## Coastal erosion information and product requirements – Roadmap



# Drought

## What people want

- Projections of future drought severity, frequency and extent
- Seasonal drought forecasts
- Updated guidance for the Periodic Reviews
- A national assessment of drought risk

## What already exists

- Future Flows maps and datasets
- The Hydrological Outlook
- Catchment-scale hydrological models
- Water company and Environment Agency Drought Plans
- An assessment of water supply vulnerability to extreme drought

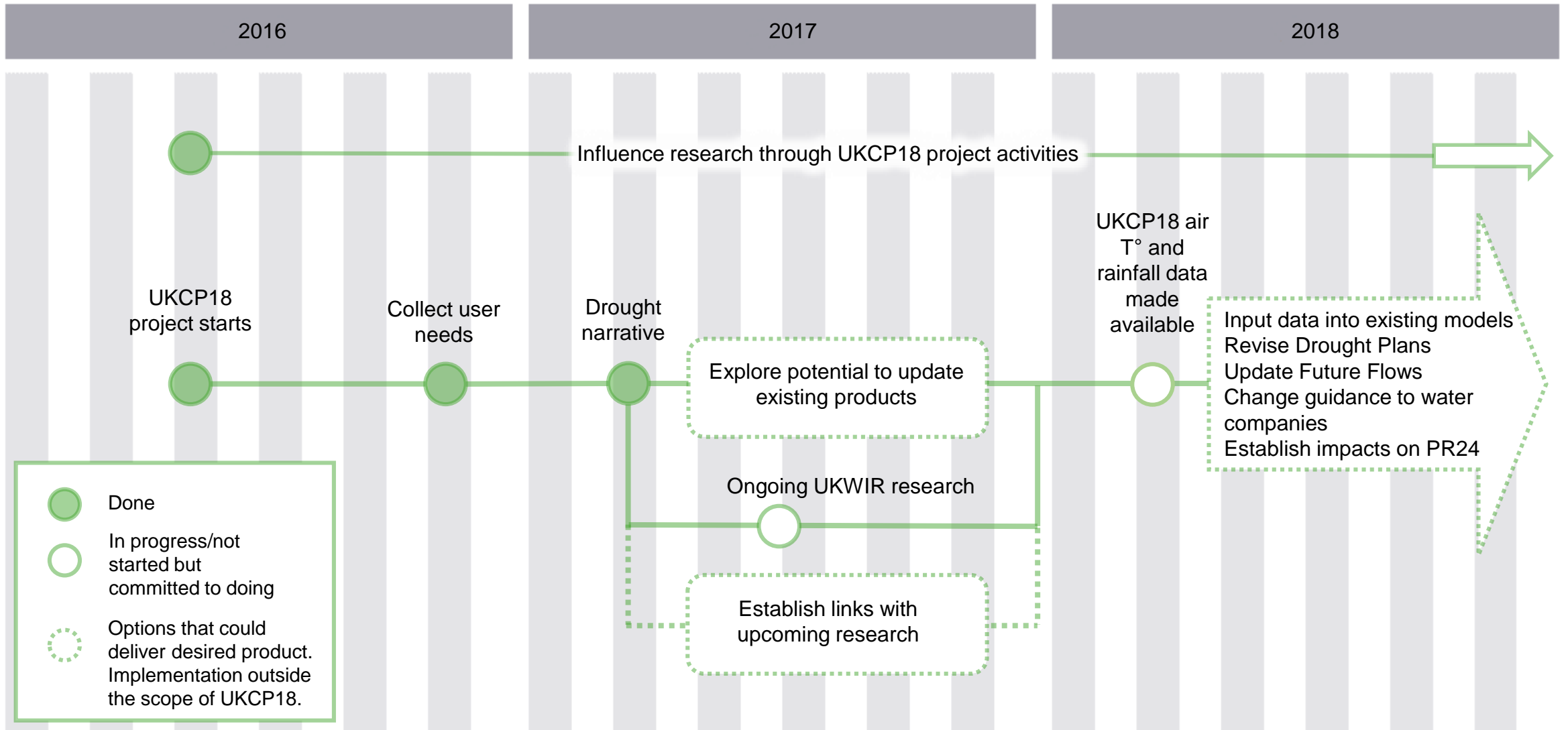
## What needs to be done

- Update Drought Plans using the latest climate change data
- Provide drought metrics in time for Water Company Periodic Review PR24
- An assessment of future drought risk under the UKCP18 projections
- Identify locations at greatest risk

## Next steps

- Update existing products with UKCP18 data where necessary
- Highlight research gaps and opportunities to utilise UKCP18 outputs in upcoming research projects

## Drought information and product requirements - Roadmap





# Flood risk

## What people want

- Inland flood risk estimates
- Sea level rise estimates
- Surface water and groundwater flood risk projections
- Catchment-scale maps of flood risk

## What already exists

- Catchment-scale hydrological models
- National flood risk assessments/maps
- National Coastal Erosion Risk Map
- Flood risk guidance for developers and the design of new assets

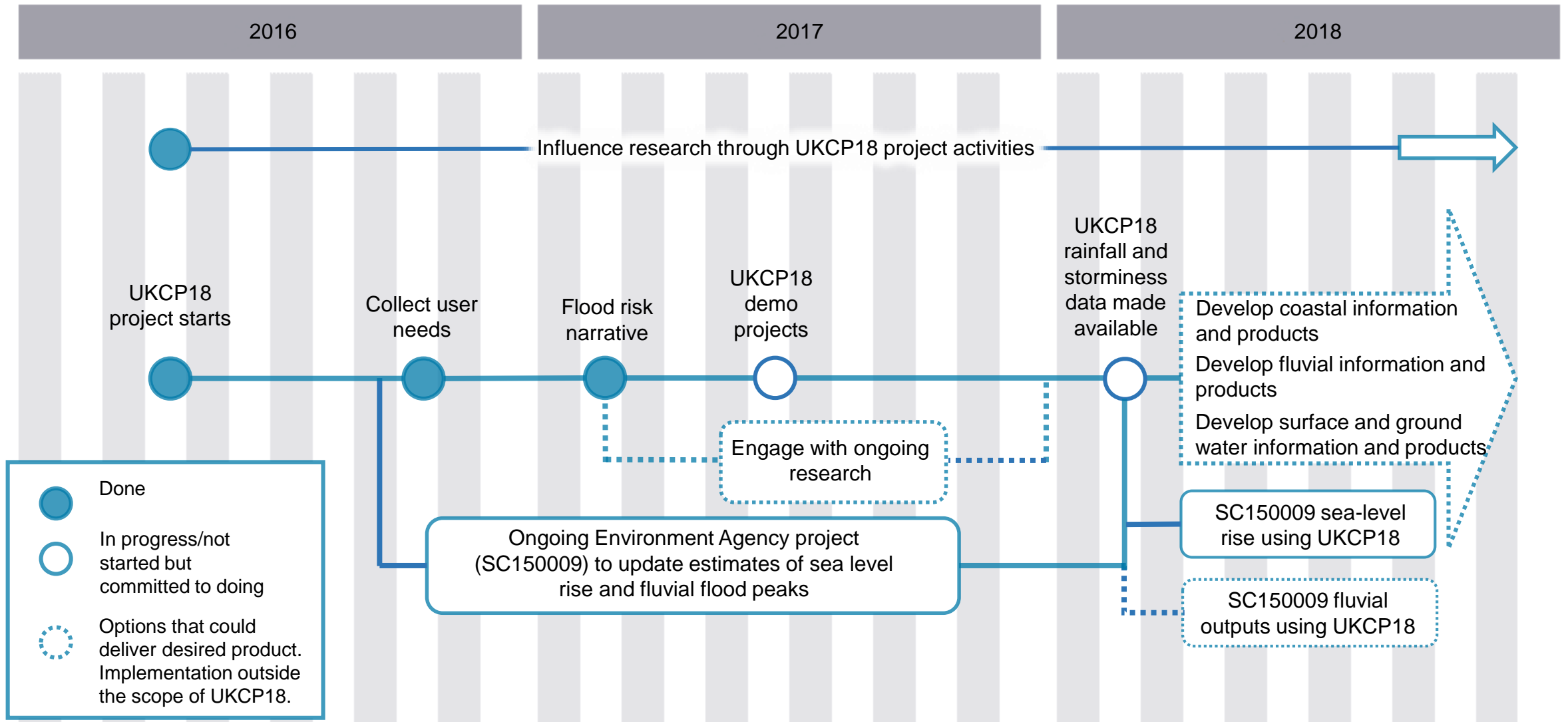
## What needs to be done

- Develop estimates of surface water and ground water flood risk
- Assess impacts on coastal flood risk from factors other than sea level rise
- Link future flood severity to impacts and communities at risk
- Update guidance for developers and risk management authorities

## Next steps

- Propose a researchers, funders and practitioners event on potential products
- Knowledge exchange workshop around UKCP18 and flood guidance
- Update existing products with UKCP18 data

## Flood risk information and product requirements - Roadmap



# Health and temperature

## What people want

- Information on the frequency of specific (high and low) temperature threshold events and how these might change in future
- Numbers of vulnerable people now and in future
- Interactive heat threshold maps

## What already exists

- ClimateJust interactive maps of present and future vulnerability
- NHS heatwave and cold weather plans with temperature thresholds
- Zero Carbon Hub overheating risk map
- Urban Heat Island maps for Manchester, London, Birmingham

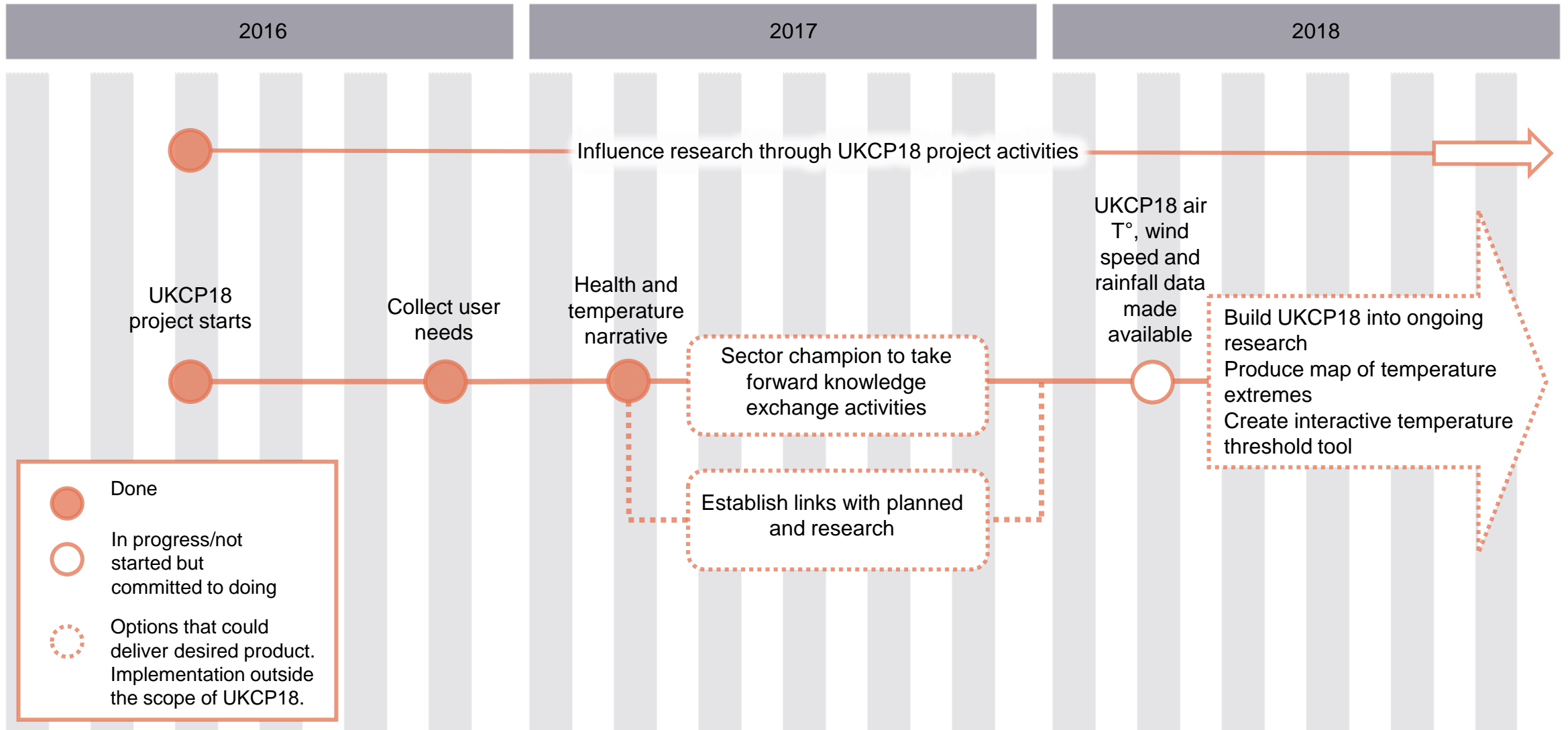
## What needs to be done

- Assess how UKCP09 projections differ from UKCP18
- Identify if an appropriate tool exists that could be updated with UKCP18
- Apply climate change information to tools that map current vulnerability

## Next steps

- Health sector champion to take this forward

## Health and temperature information and product requirements - Roadmap



# Landslides

## What people want

- Maps of landslide risk
- An understanding of how landslide risk is likely to change under future climate scenarios
- An understanding of the causal factors of landslides

## What already exists

- Daily landslide risk assessments by the British Geological Survey (BGS)
- Predictive models of mud and debris flow (not climate change related)

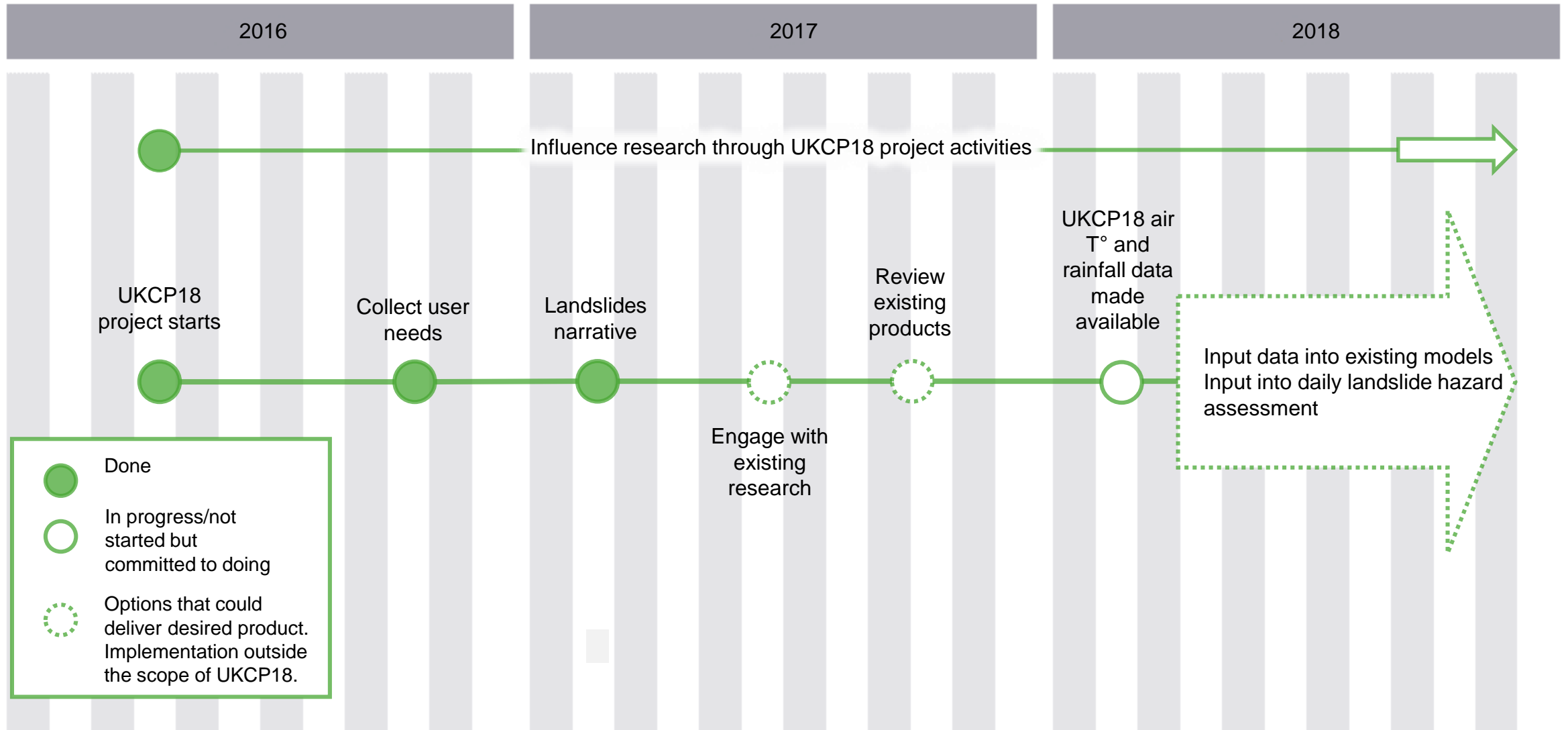
## What needs to be done

- Establish the key links between changes in climate and changes in landslide risk
- Determine what type of landslide risk product would be most useful to users (e.g. time step, spatial resolution, etc.)

## Next steps

- Highlight research gaps and opportunities to utilise UKCP18 in upcoming research projects

## Landslide information and product requirements – Roadmap



# River erosion and bed scour

## What people want

- To understand present river erosion and bed scour status
- Maps of future fluvial erosion risk for the UK
- Projections of how river paths may change due to climate
- To understand climate change impacts on asset deterioration

## What already exists

- Fluvial erosion risk models
- Case studies of erosion for specific fluvial locations
- Flood risk management plans

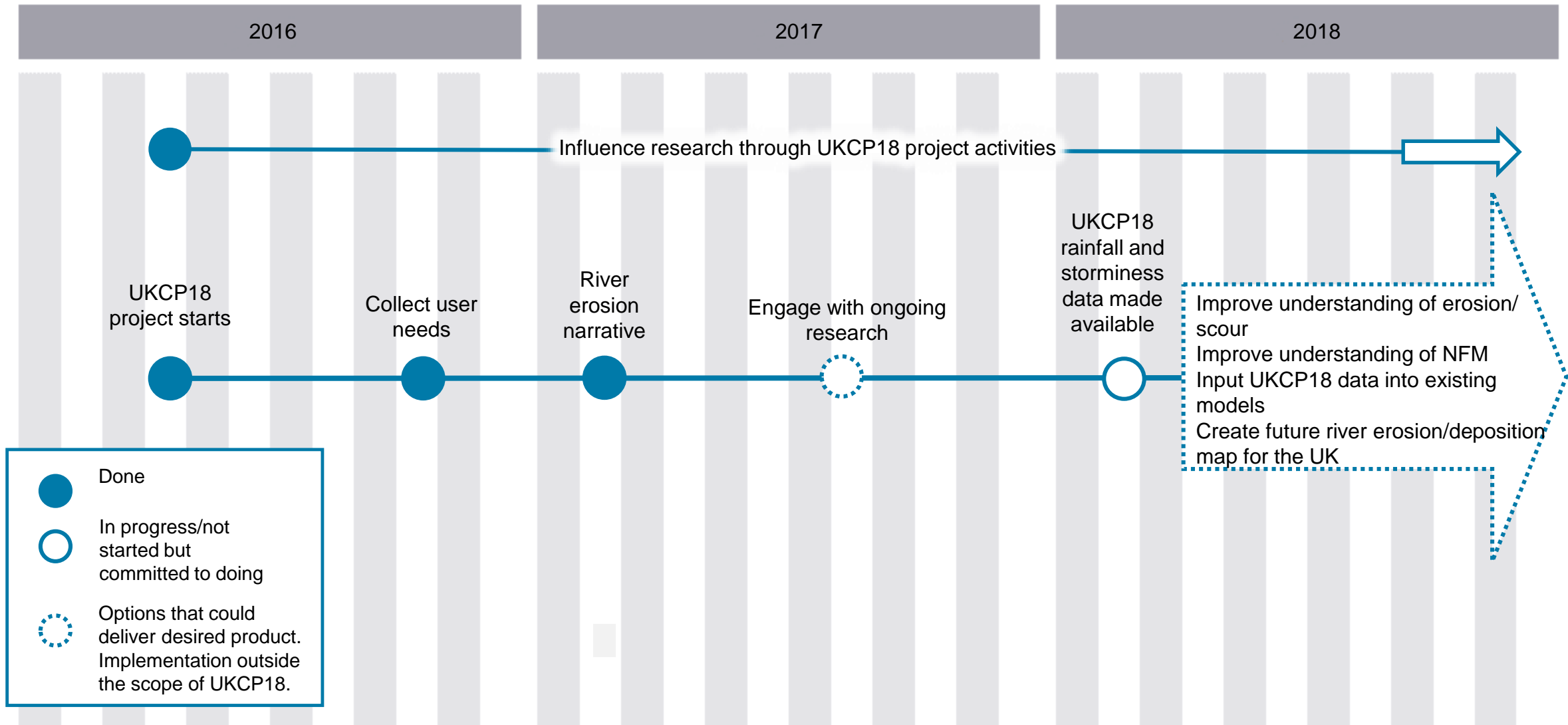
## What needs to be done

- Assess implications of UKCP18 for fluvial erosion risk
- Better understand spatial variability in erosion risk
- Develop new products that link risk to impact
- Improved understanding of natural flood management (NFM)

## Next steps

- Update existing products with UKCP18 data where appropriate
- Highlight research gaps and opportunities to utilise UKCP18 outputs in upcoming research projects

## River erosion and bed scour information and product requirements – Roadmap





# River flow and levels

## What people want

- Projections of future changes in river flows, particularly high and low flows
- Maps of possible changes in future river flows
- Daily peak flow data
- An understanding of the significance of future changes in flows

## What already exists

- The Future Flows and Groundwater Levels project, dataset and maps
- Hydrological models using climate change factors
- A proof of concept web based interface with future flow data and maps across Europe (the EDgE project)

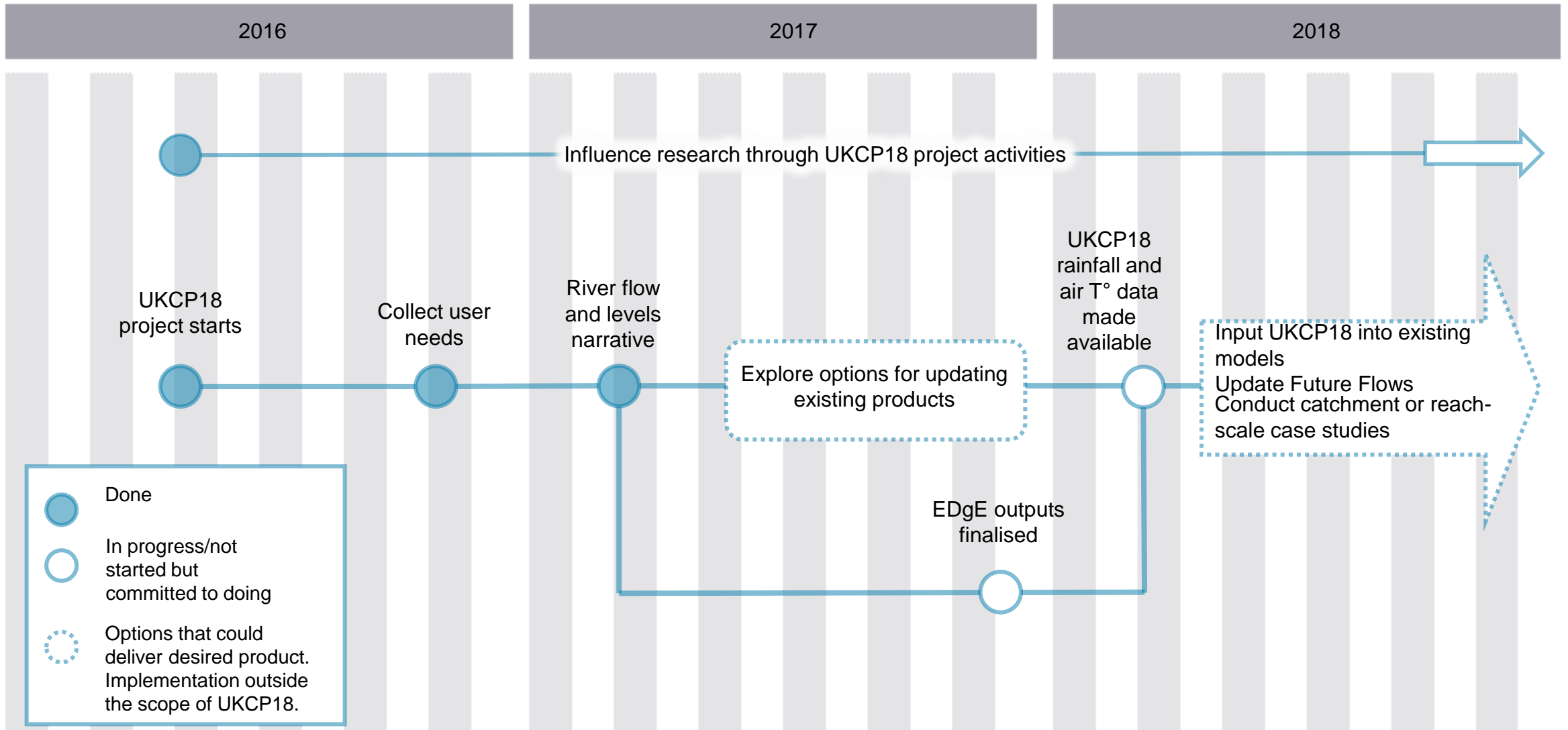
## What needs to be done

- Establish how different UKCP18 outputs are from UKCP09 for the purposes of hydrological modelling
- If UKCP18 and UKCP09 outputs are significantly different, assess the viability of updating Future Flows

## Next steps

- Hold knowledge exchange workshop to agree best option
- Identify potential funding for a new or updated future river flows product

## River flow and levels information and product requirements – Roadmap



# Soil moisture deficit

## What people want

- Information on how soil moisture deficit (SMD) might change in future
- Data on actual and potential evapotranspiration
- Information on non-climatic influences on SMD

## What already exists

- Hydrological Outlook
- Projections of summer SMD for 2021-2050 (European Environment Agency)

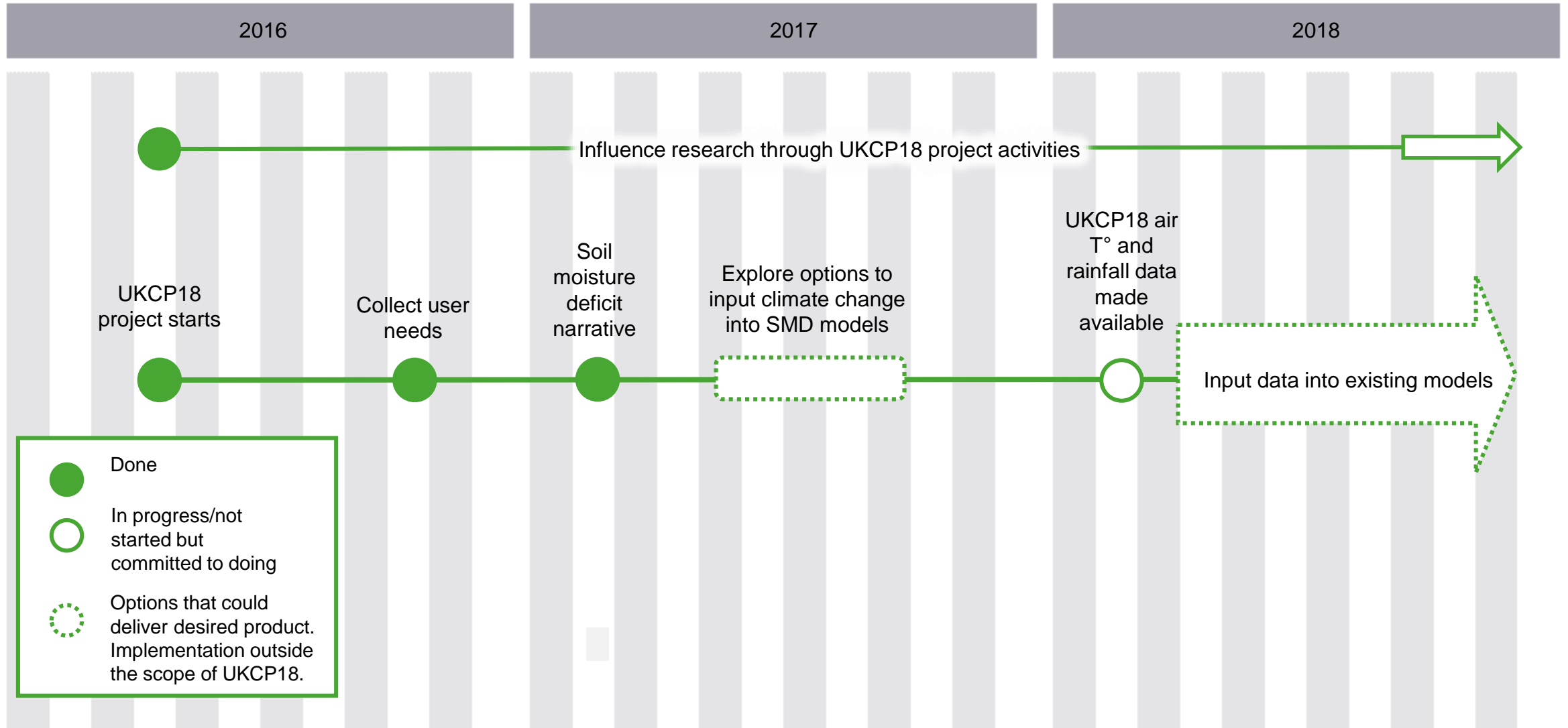
## What needs to be done

- Update the Hydrological Outlook with UKCP18 data if appropriate
- Build consensus on SMD modelling and data.

## Next steps

- Highlight research gaps and opportunities to utilise UKCP18 outputs in upcoming research projects.

## Soil moisture deficit information and product requirements – Roadmap



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