WATCH

WATer management for road authorities in the face of climate CHange

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Deltares

The WATCH project

- CEDR call: Climate Change: From Desk to Road
- September 2016 – April 2018
- Project budget
  - Total 275 k€
  - Self investment of partners 31 k€
- Partners
  - Deltares (coordinator, The Netherlands)
  - ROD-IS (Ireland)
  - Egis (France)
  - Danish Road Directorate (Denmark)
  - KNMI (The Netherlands)

The WATCH project





CEDR: most important high frequency causes of road flooding

- Water in area around the road
  - Surface run-off
  - Pluvial flooding
- Heavy rain on the road itself

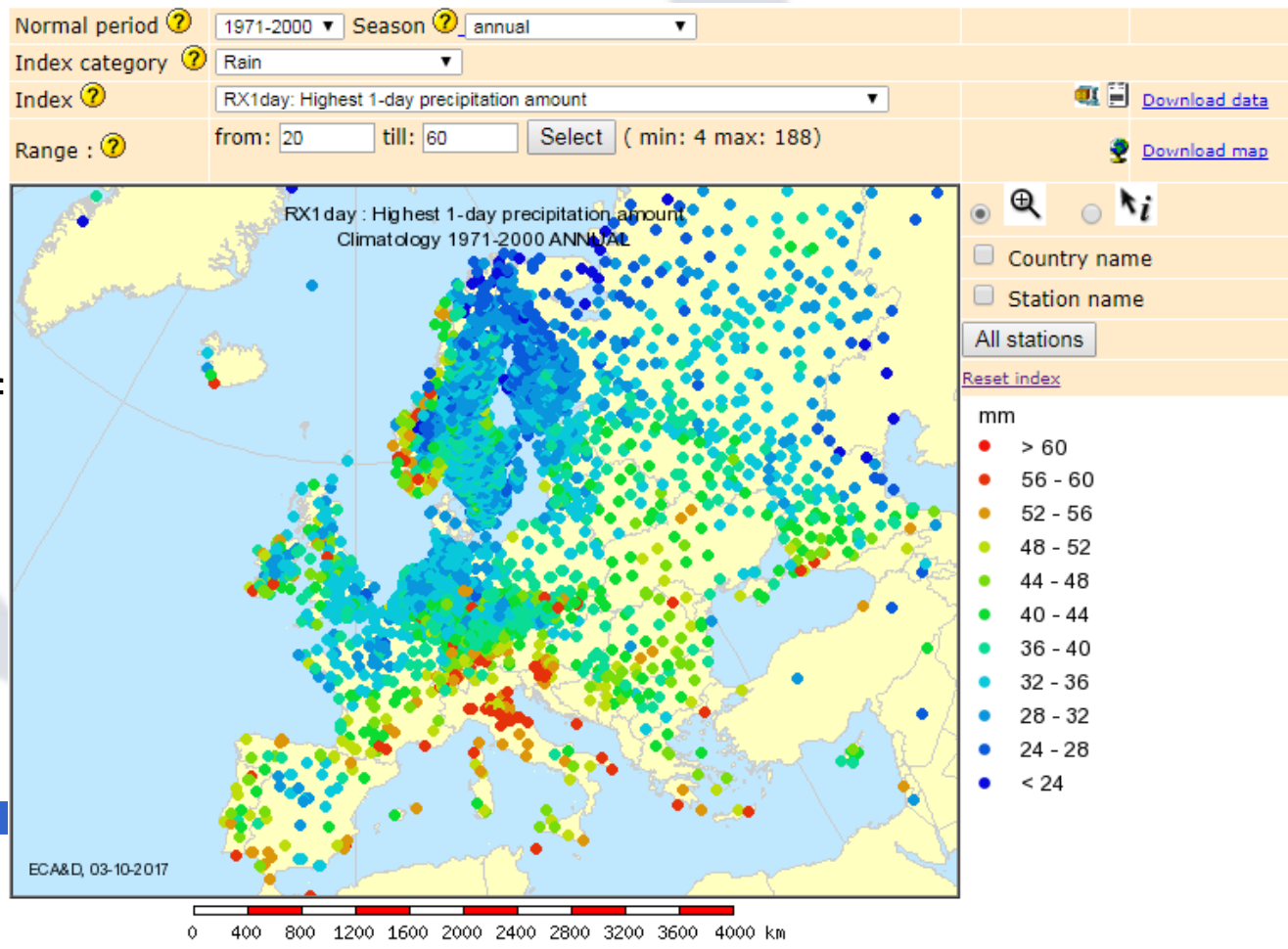
WATCH deliverables

- A **country comparison report** showing the state of practice of existing water management and drainage approaches
- **Guidelines for application of climate information** to be used in road drainage design and maintenance
- A **climate analogues tool** for rainfall extremes in Europe
- A **protocol for adapting SuDS** systems for climate change
- **Guidelines for a socio economic analysis** of adaptation and maintenance approaches for water management
- Culminating into one document,

"How to do" manual on water management assessment of resilience, understanding and applying consequences for design, inspection and maintenance

Climate analogues tool

- Climate analogues tool plus guidance developed
  - http://www.ecad.eu/Watch/index.php
- Tool shows locations in Europe with similar rainfall intensities
- Future climates of a location currently already exist at other locations

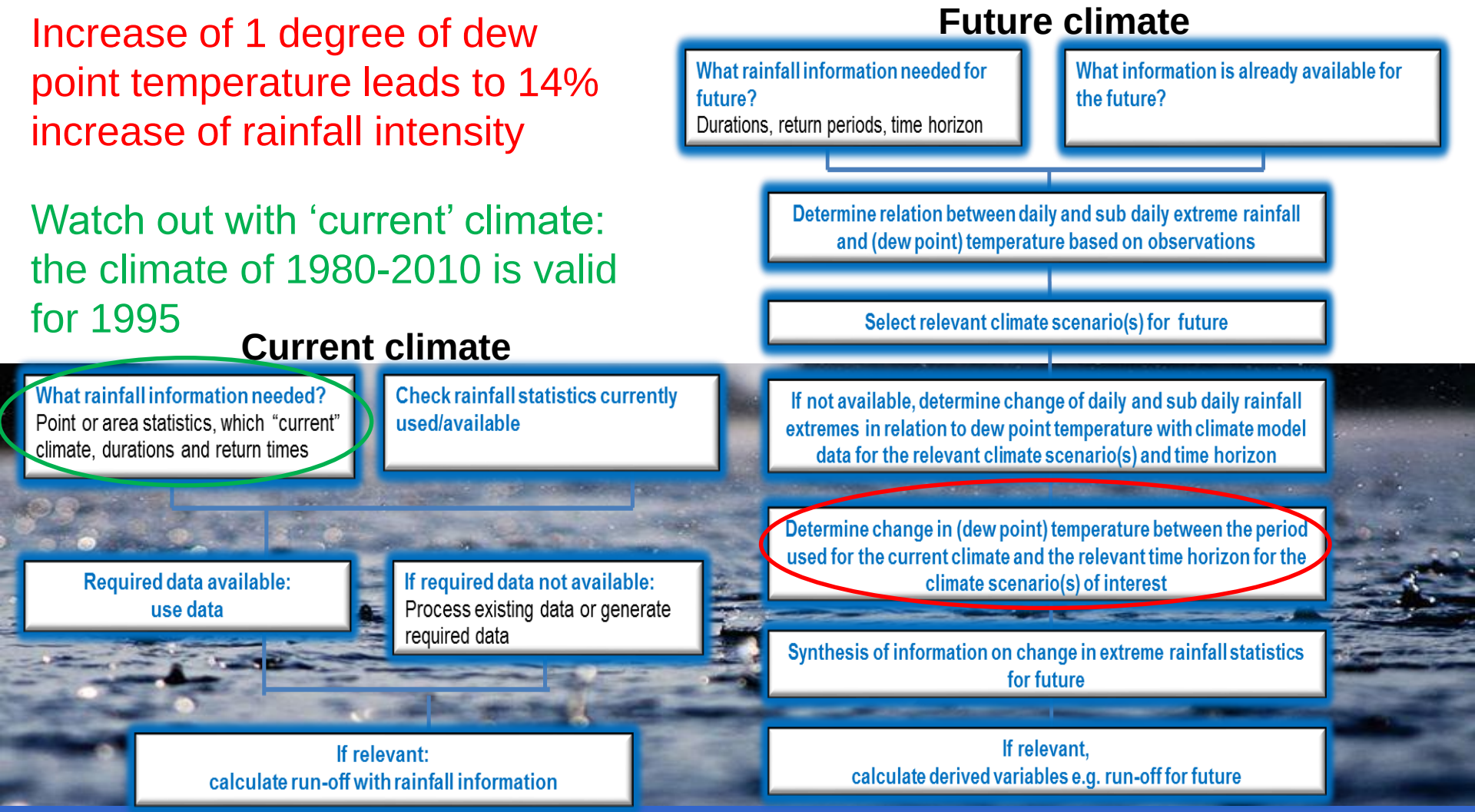


CEDR
Conférence Européenne des Directeurs des Routes
Conference of European Directors of Roads

Climate data protocol

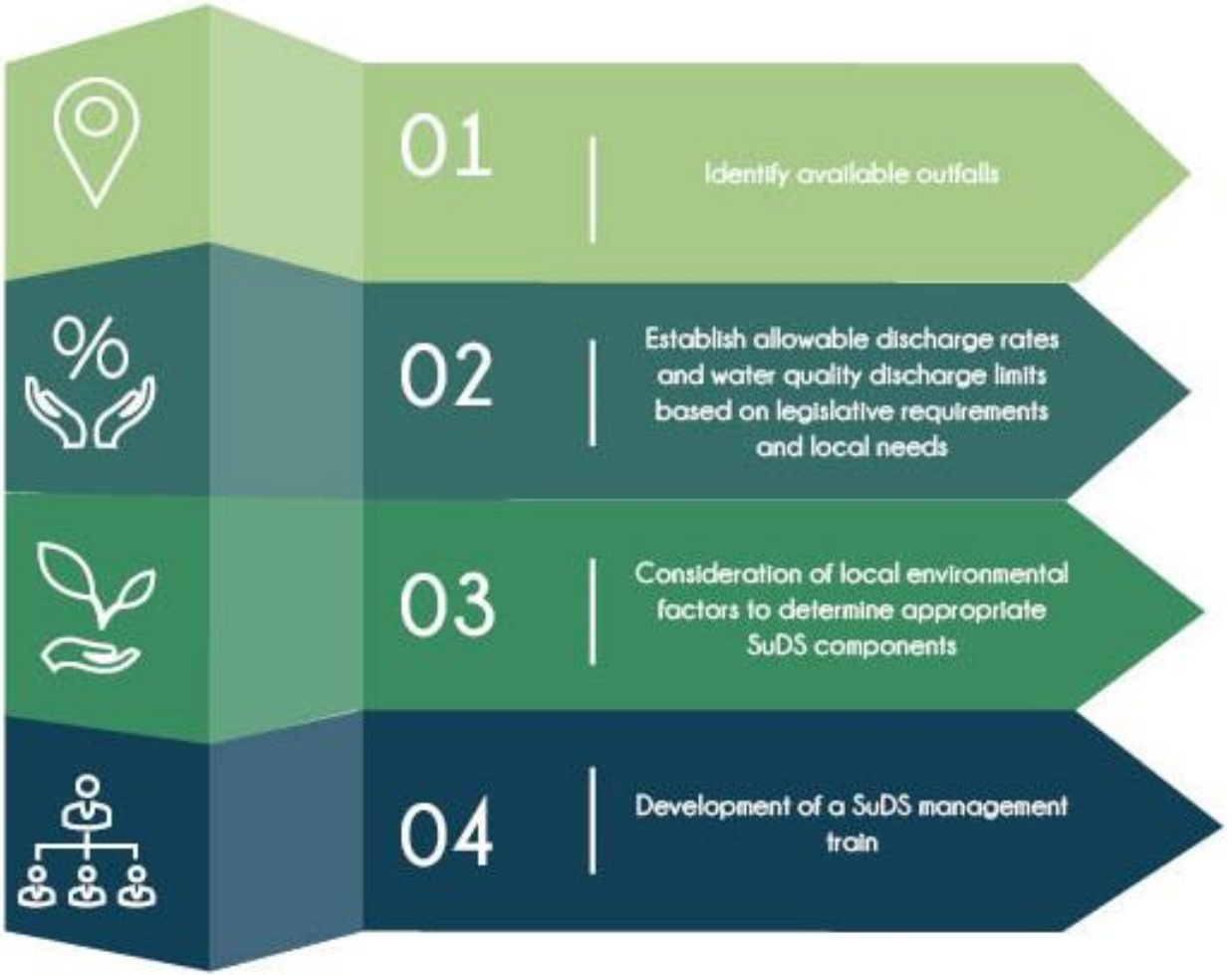
Increase of 1 degree of dew point temperature leads to 14% increase of rainfall intensity

Watch out with 'current' climate: the climate of 1980-2010 is valid for 1995



Deltares Enabling Delta Life · egis · RODI Innovative Solutions · Vejdirektoratet Danish Road Directorate

SuDS Protocol for New & Existing Roads



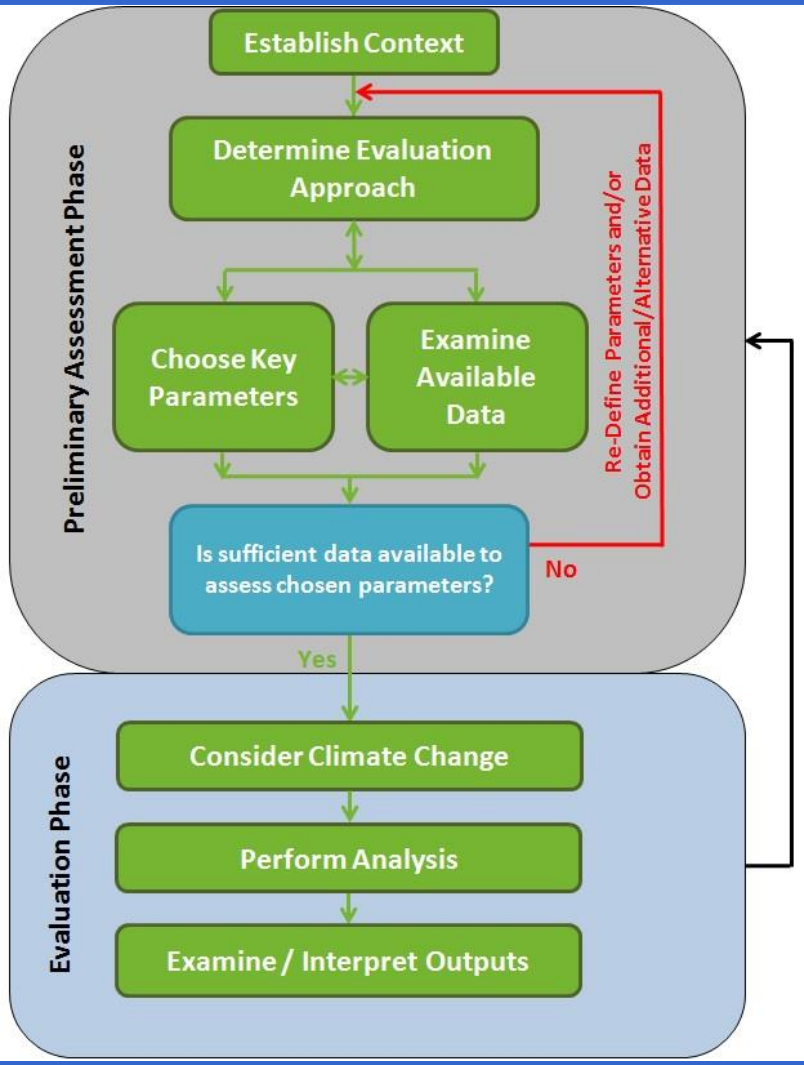
Socio- Economic Analysis Framework

Socio economic analysis essential for implementation of the WATCH outcomes

- Provide arguments whether actions needs to be taken
- Choose optimum solution

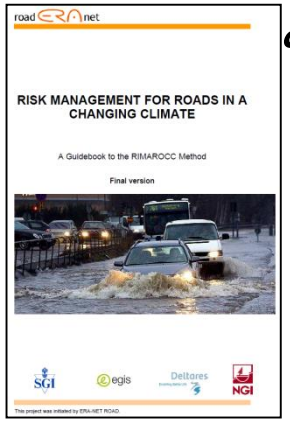
Evaluation approaches

- Multi Criteria analysis
- Cost Benefit Analysis
- Cost Effectiveness Analysis
- Life Cycle Costing

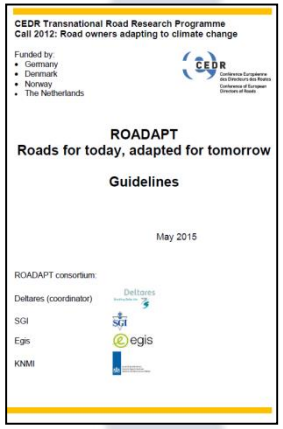


MANUAL

based on RIMAROCC

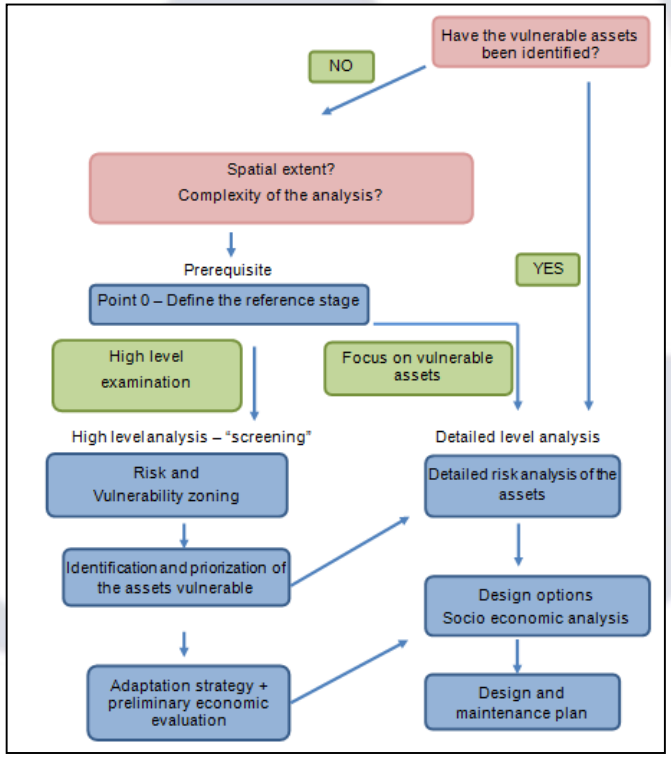


and ROADAPT



MANUAL

Decision tree and guidelines



Adaptation plan / measures

Protection – adaptation measure

Traffic management - Copyright @CentreFrance

Maintenance - Copyright @Dorchester County, south Carolina

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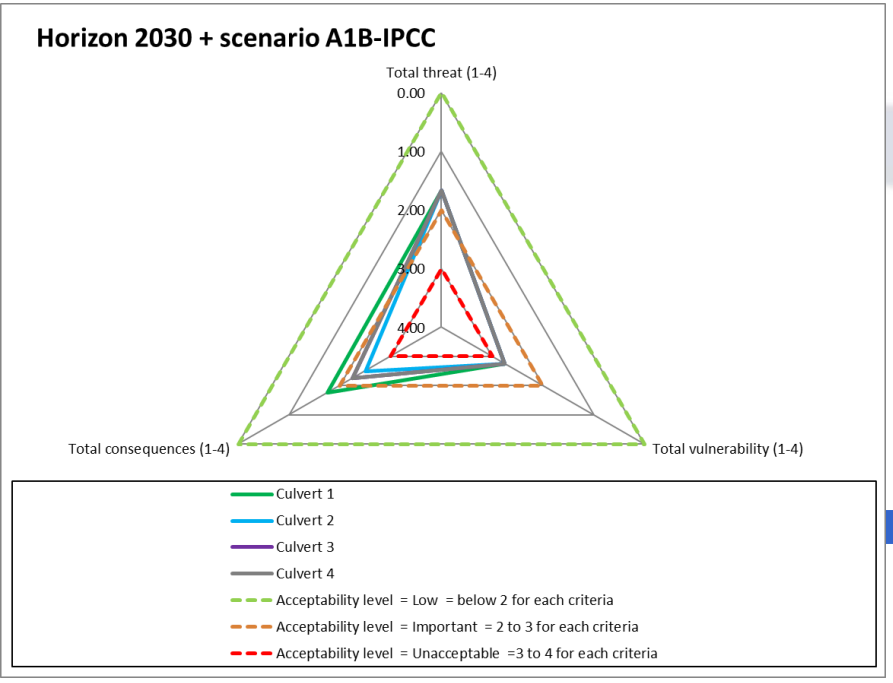
Case study

- Demonstration and validation of WATCH deliverables
- Showcasing how WATCH results can be implemented
- Conducted on M10, a major road leading into Copenhagen

Measure	Net Annual benefit	B/C ratio	Annual net benefit	B/C- ratio
When	present day climate	present day climate	2030	2030
Enlarging capacity of culverts (Construction cost €2,500,000)	€ 43,536	141,200/97,664 = 1.45	€267,550	300,050/97,664 = 3.1



Case study

- Results show that
  - Many major and minor assets can beneficially be revised with the WATCH approach for improved holistic water management
  - CBA provides new and/or more elaborate way of assessing and ranking parameters
  - The manual and CBA improve basis for optimum decision making, e.g. on assessing environmental issues when installing SuDS features, such as retention basins
  - Improving data gathering, storing and streamlining, e.g. for optimum risk analyses, was highlighted as a particular result focus area for improved water management

Thank you for your attention

http://www.cedr.eu/strategic-plan-tasks/research/cedr-call-2015/call-2015-climate-change-desk-road/

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