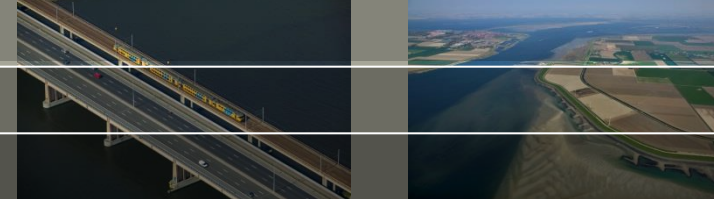# TKI Project: "Multi-stage Stochastic and Robust Optimization of Flood Mitigation Measures under Forecast Uncertainty"

Workshop Stakeholder

Utrecht, 8 December 2015

Inventarisatie van de behoeften voor de operationele ondersteuning van besluitvorming in het Nederlandse waterbeheer:

- omvat onder andere het voorspellen van wateroverlast of -tekorten en kosten-efficiënt waterbeheer in meer dagelijkse omstandigheden
- resultaten van de workshop bestaan uit een evaluatie van de bestaande instrumenten, alsmede het ontwerp en de implementatie van de volgende generatie software te ondersteunen voor een slimmere waterbeheer in het kader van de lopende TKI project
- doelgroep van deze workshop zijn nationale en regionale overheden (rijkswaterstaat, waterschappen) alsook adviseurs op dit gebied

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Agenda
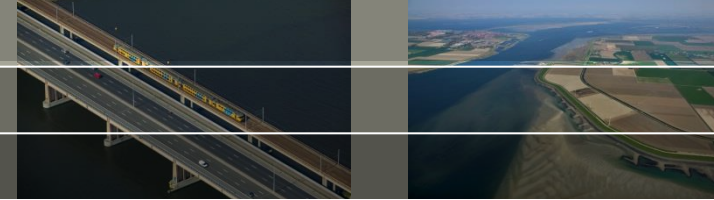
- **9:00 - 10:00**
  Inleiding tot het TKI project "Multi-stage Stochastic and Robust Optimization of Flood Mitigation Measures under Forecast Uncertainty" (motivatie, doelstellingen, resultaten, de deelname van derden, enz.)

- **10:00 - 14:00**
  Eisen en wensen van de belanghebbenden ten aanzien van de real-time control van watersystemen (Denk aan wat je zou willen hebben op een termijn van ongeveer 5 jaar)

- **14:00 - 15:00**
  Identificatie van een aantal representatieve test cases voor verdere analyse

- **15:00 - 16:00**
  Bespreking van de vervolgactiviteiten: verdere deelname van de belanghebbenden, tijdschema, etc.
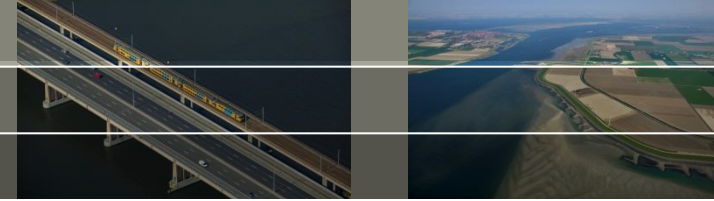
- Development of an integrated tool for real-time control and operational decision support since 2008, current version of RTC-Tools since 2010

- Most research and development activities were driven by clients abroad (SDWA, Bonneville Power Administration, CEMIG) and focused on (hydropower) reservoir systems

- Main application areas:

  - Short-term decision support for hydropower reservoirs

  - Short-term decision support for low-land water systems

  - Feedback control component (D-RTC) in Delta-Shell

 - Stand alone as 0D model for reservoirs in forecasting systems

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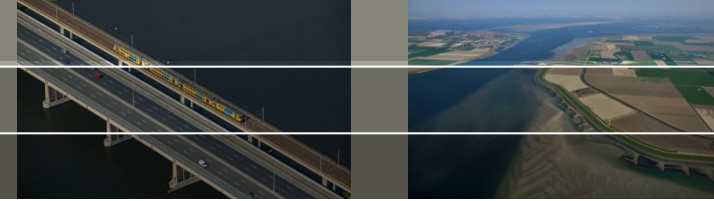
Conceptual challenges:

- Binary / integer decision and logical constraints

- Multi-objective decision making

- Consideration of forecast uncertainty (data and models) to propose robust decisions based on uncertain inputs

Technical challenges:

- Review of the existing software framework and potential redesign of the whole package or components

  - Model library (Which processes are needed?)

  - Computation of 1st and 2nd order derivatives

  - Integration with other Deltares software packages (Delft-FEWS, DeltaShell, NHI, Ribasim, etc.)
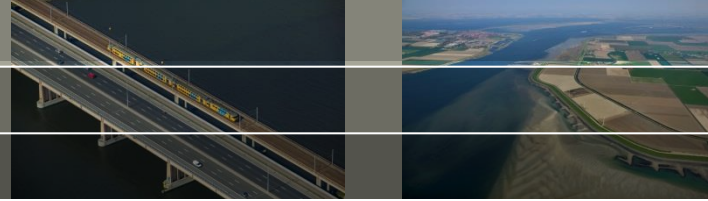
Assignment of the TKI grant in summer 2015 to address Dutch water system in particular

- inception phase until early 2016 including a statement of work of work for the remaining project
- Execution until June 2018

Next generation software package (RTC-Tools 2.0) will become available in the course of the project.

TKI projects are open to third parties.

Current project classification is "fundamental" and we aim to add additional "applied research" project in the near future.

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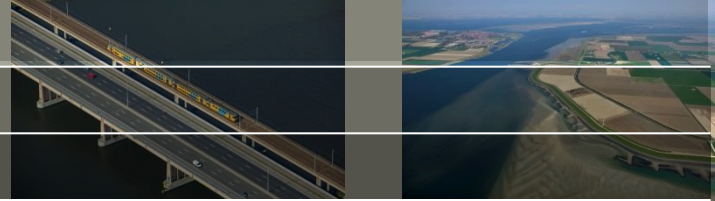
Urgent issues:

- cooperation contract

Your participation?

- access to repository → Share Point? (Dirk)

Follow-up workshops

- Presentation of the inception phase results in March 2016

Position paper (smart water management in the Netherlands)? Focus on technology, but also infrastructure and policy