
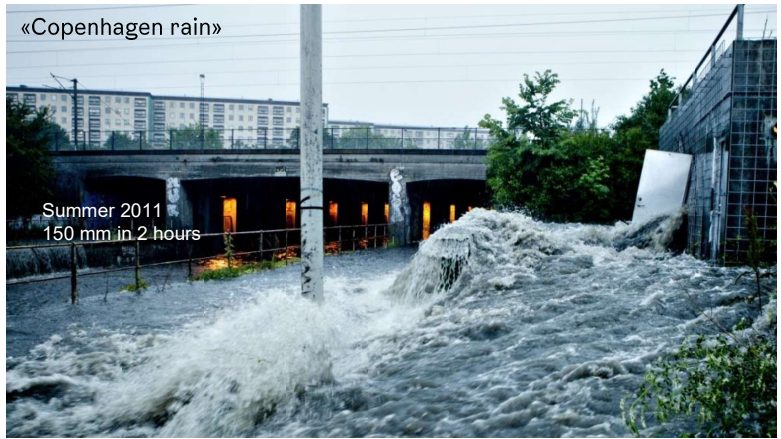


Oslo

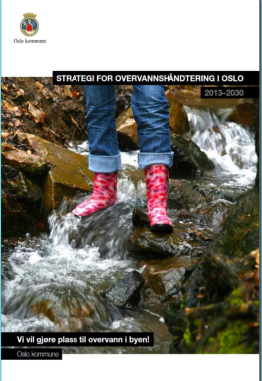
**Action Plan for Stormwater
City of Oslo**

Bærekraftige og urbane hydrologiske systemer, Oslo - Miljødirektoratet
17.6.2019

Bent Braskerud (VAV)
Yvona Holbein (PBE)





Strategy for Stormwater
Approved in 2013

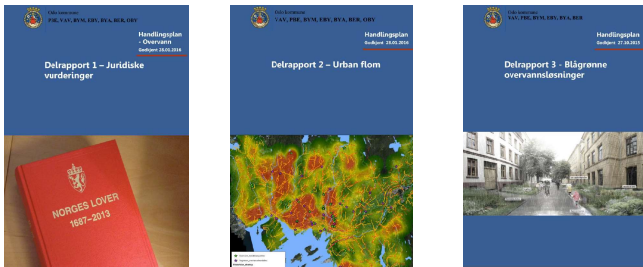


Oslo

**Action Plan for Stormwater
2016**

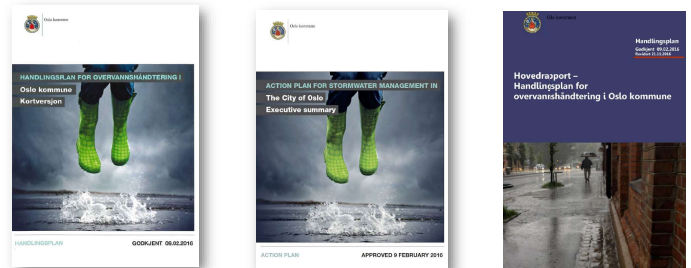


Different reports as background



Action Plan for Stormwater

- Short version - Norwegian
- Short version - English
- Long version - Norwegian



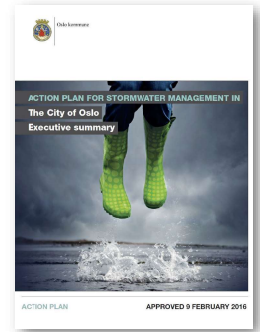
Action Plan for Stormwater includes:

- 1. Knowledge
- 2. Flooding
- 3. Oslo city with good examples
- 4. Cooperation
- 5. Information and guidance

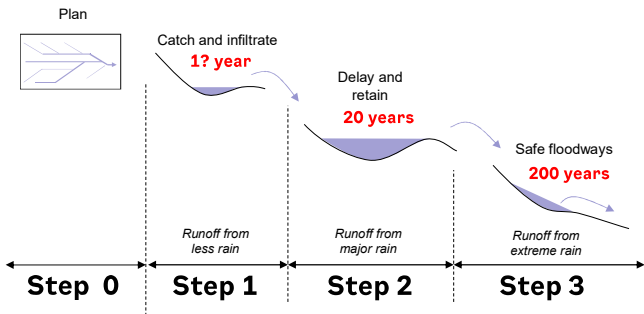


1. Knowledge

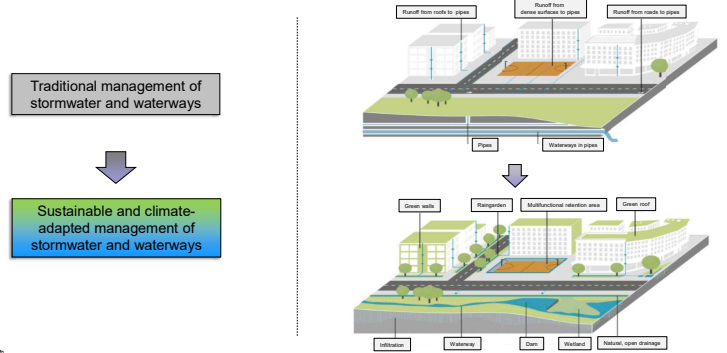
- The stormwater **3-step approach**
- Map **infiltration** possibilities
- Map rainfall events and **damages**



The stormwater 3-step approach

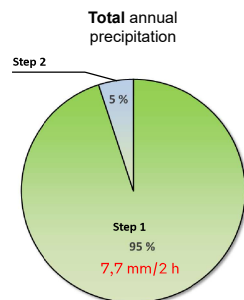
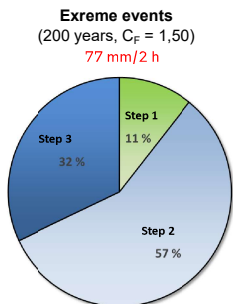


The city of the future is **blue-green** and **multifunctional**

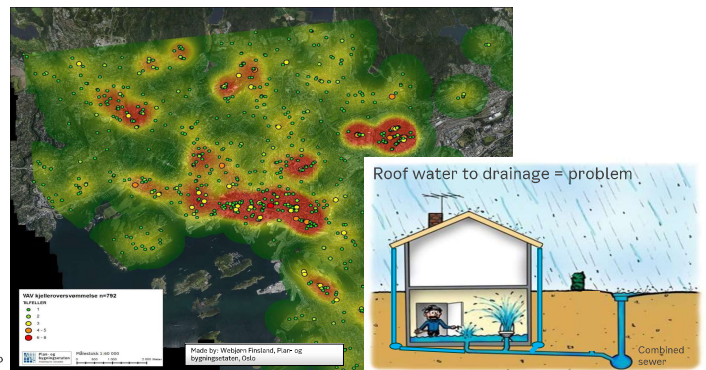


Ill: Hanna H. Storemyr

How is the stormwater taken care of in the 3 steps?



Mapped flooded basements in Oslo



2. Flooding

- Map: Stormwater and urban flooding
- Plan, construct the floodways and retention
- Establish operational emergency response
- Establish retention in built-up areas



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Step 3: Floodways



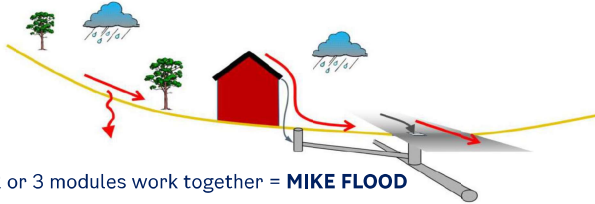
Oslo

Oslo

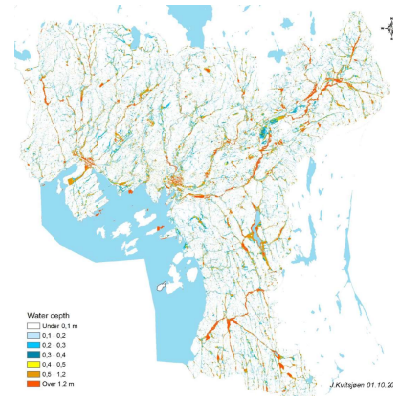
Modelling runoff and waterways

3 modules:

- Runoff on terrain (Mike 21)
- Pipes (Mike Urban/Rosim)
- Waterways (Mike Hydro River)



Oslo



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Oslo

Modelling: Copenhagen rain in Oslo

- Floodways
- Depths in colors



- Modelling of all Oslo in Mike Flood for different rains
- Planning for major floodways and retention areas (cloud burst plan)

Example of cloud burst plan: Copenhagen



Figur 23. Byen er inddelt i 7 nedbørfelt, på tværs af vanlige, administrative inddelinger.

Oslo

Cloud burst plan in one catchment area in Copenhagen



Retaining stormwater on municipal property



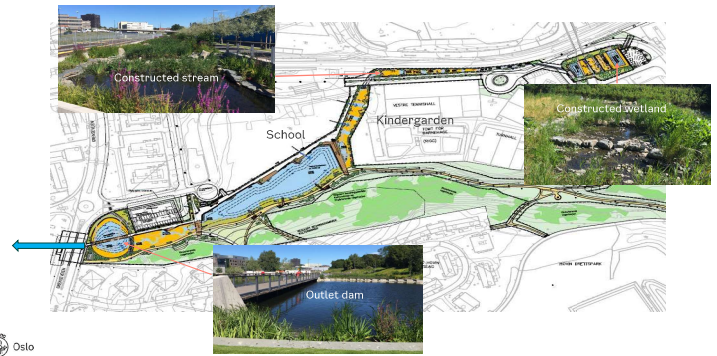
Oslo

3. Oslo city with good examples

- ▶ Develop a **guide for municipal projects**
- ▶ Retaining **stormwater on municipal property**
- ▶ Develop a **new road and street norm** for Oslo



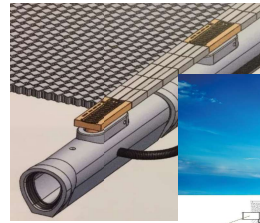
Example Oslo: Open stream and dam at Teglvirket School



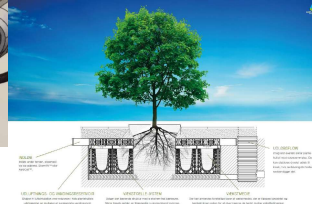
New road and street norm for Oslo

Implement: **Testing of new SUDS**

Permeable pavers and **shallow placed pipes?**



Trees supplied from storm water pipes (Deep Green)?



Raingardens as the new road drain?

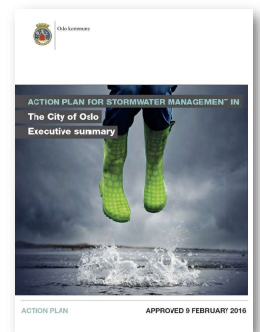
- ▶ Establish **guidelines/routines for spatial planning** and building
- ▶ Coordinate **complaint processing**
- ▶ Establish the **digging coordination** system

4. Cooperation



- ▶ Produce more **fact sheets**
- ▶ Upgrade the **stormwater planning guide**
- ▶ Develop a **communication strategy**
- ▶ **Funding schemes for private SUDS**

5. Information and guidance



Further develop our database of fact sheets

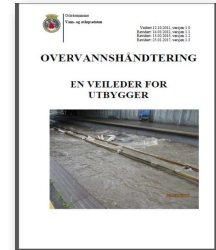
VAV and BYM editors



www.oslo.kommune.no/overvann

Upgrade the storm water planning guide

- Define more **exactly all the 3 steps** (rainfall)
- Define **climate factor** (addition for future rain)
- Define **demands** when planning/building
- Establish **checklists**
- Give a **guideline and examples** to the contractors for all stages of a development



Today's guide from VAV

Action Plan for Stormwater

Knowledge

Flooding

Oslo city with good examples

Cooperation

Information and guidance



Our goal: Sustainable water management in all the city



Thank you for your attention...

.... and good luck in making a world more **blue** and **green** !



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