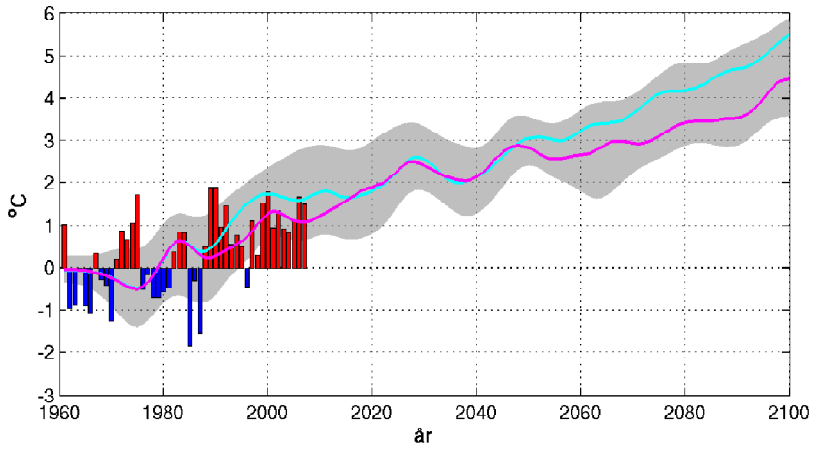
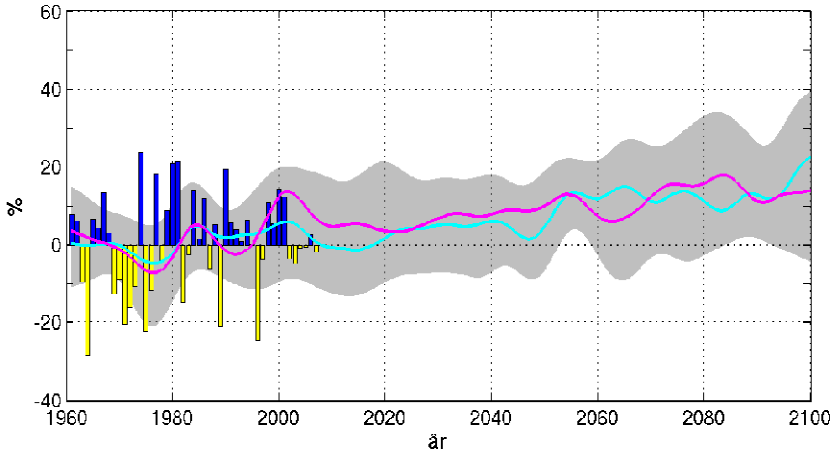
Calculated and observed temperatures in Stockholm



Source: SMHI

Calculated and observed annual percipitation levels in Stockholm

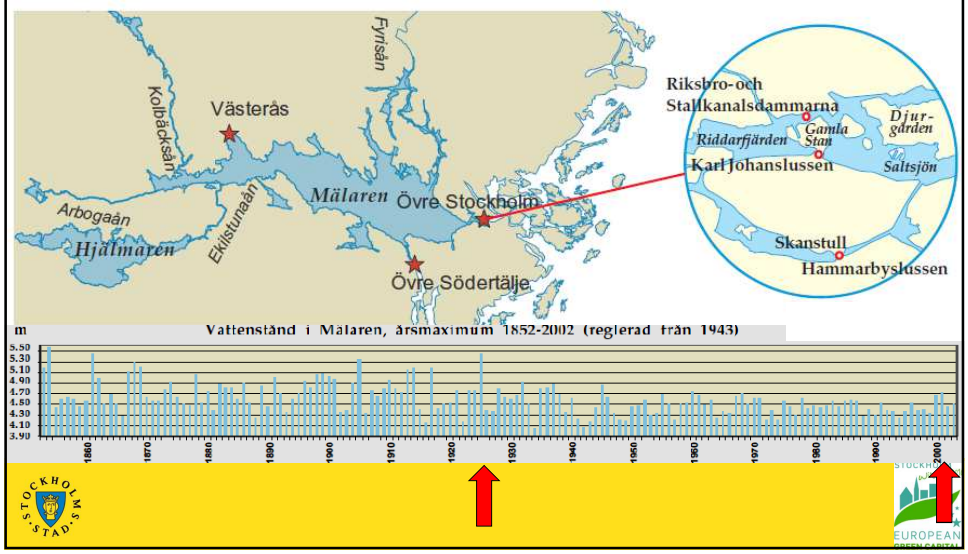


Source: SMHI

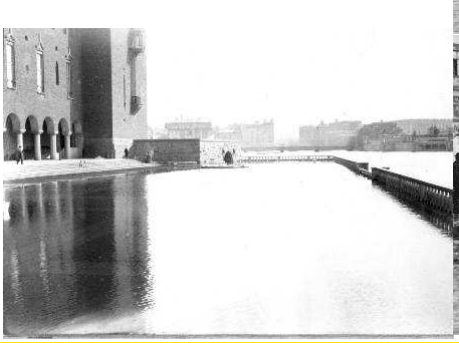
How does the climate change effect us 2100?

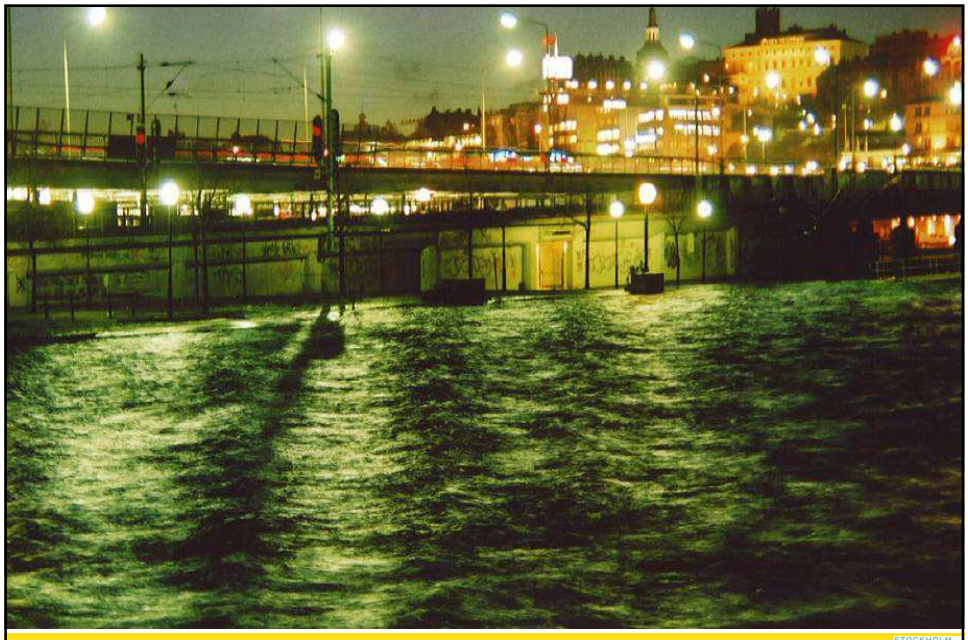
- Warmer mean temperature, 3-4°C
  - Longer growing season (1-2 months)
  - Less snow and shorter winter season
  - Less ice on the lakes
- Percipitation changes
  - Winter up to + 40%
  - Summer up to -20%
  - Increased risk for flooding of lake Mälar during winter
  - Lower levels on lake Mälar during summer
- Higher sea level ~40-80 cm

1. The Lake Mälar



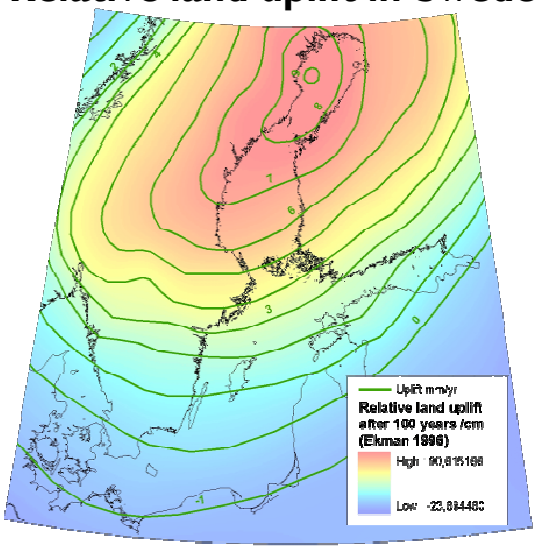
Stockholm 1924





Gamla Stan Metro Station Autumn 2000

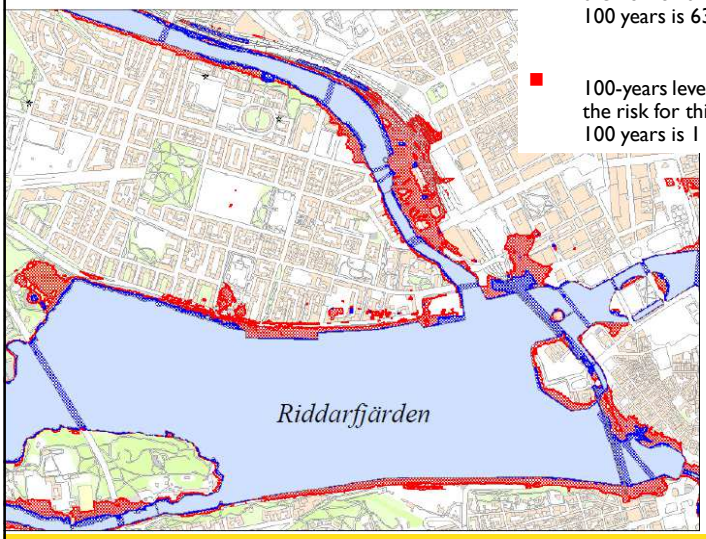
Relative land uplift in Sweden



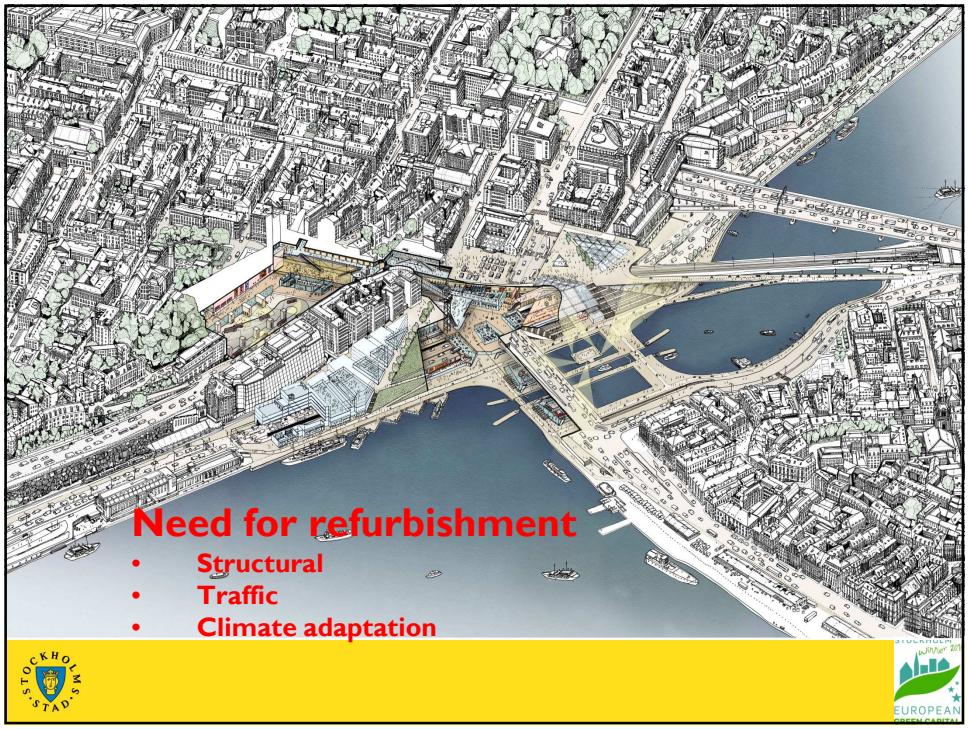
- 100-years level: + 1,3 meter

  the risk for this happening during the next 100 years is 63%

- 100-years level including wind: + 2,3 meter
  the risk for this happening during the next 100 years is 1 %

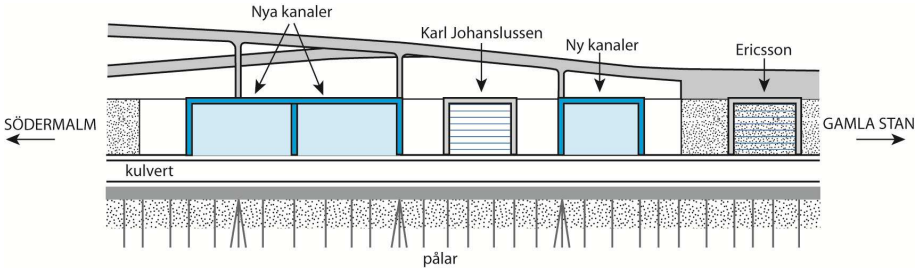



The locks at Slussen

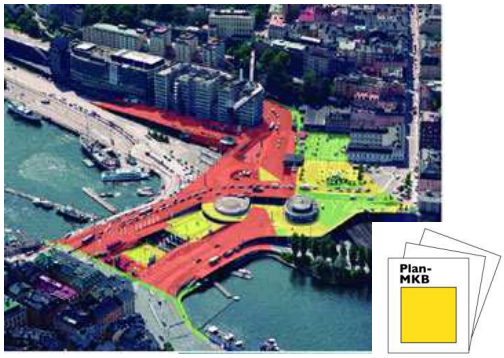

Need for refurbishment
• Structural
• Traffic
• Climate adaptation

New canals for increased flow

Increased water flow from 800 m³/s to 2000 m³/s



Two legal processes



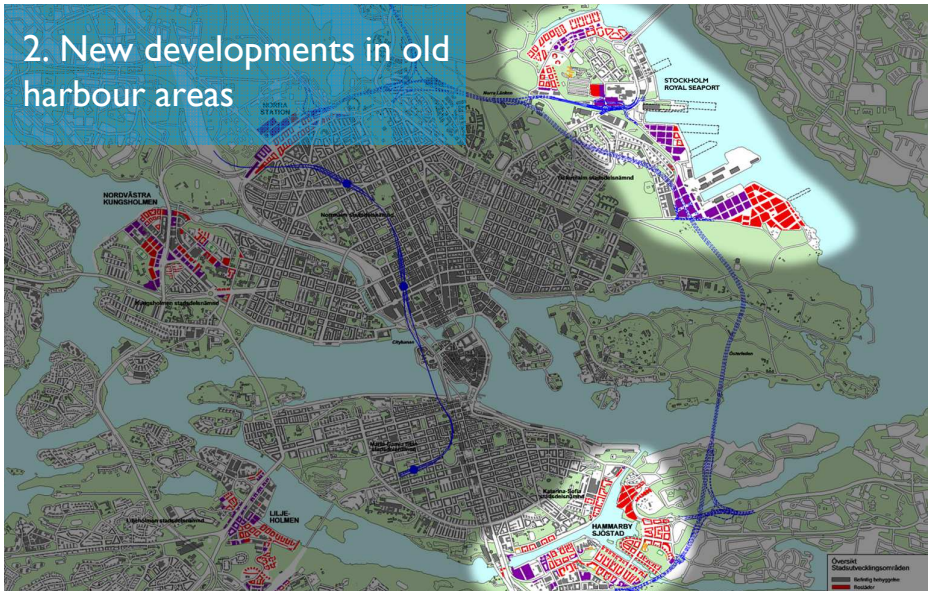
New detailed development plan

Land-use, traffic solutions etc

New environmental court ruling

New canals, other structures in water and decission on conrolling levels of the Lake Mälar

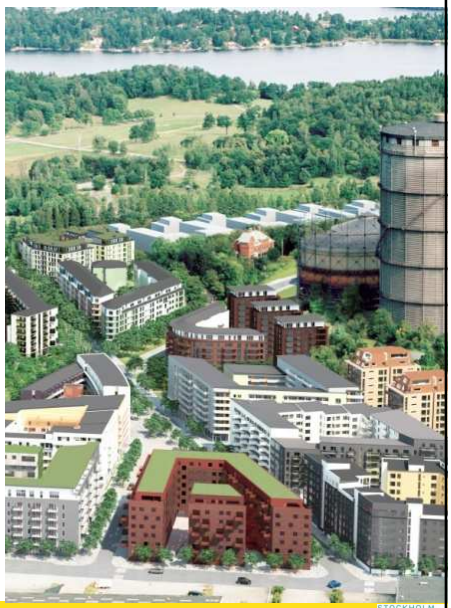
2. New developments in old harbour areas



Adaptation measures

- Houses are placed 2,5 meter above the average sea level
- Vegetation on roofs, walls, in yards and parks give shade, lower temperatures, absorbe rain and CO_2
- Measures to stabilize the ecosystem

- 1,5 tonnes Co2/per person 2020
- Fossil fuel free by 2030



YTA:	FAKTOR:	ANTAL	AREA:	SUMMA:
Delfaktorer grönska				
Ej underbyggd markgrönska	2		0	0
Växtbädd (≥800 mm)	1,2		75	90
Växtbädd (200-800)	0,2		675	135
Gröna tak (> 300 mm)	0,4		0	0
Gröna tak (50 - 300 mm)	0,1		500	50
Grönska på väggar	0,4		500	200
Balkonglådor	0,3		0	0
Tilläggsfaktorer grönska/biodiversitet				
Fjärilsrestauranger	1		100	100
Naturligt arturval	0,5		50	25
Diversitet i fältskiktet	0,7		0	0
Diversitet på tunna Sedum-tak	0,1		0	0
Integrerade balkonglådor med klätterväxter	0,3		0	0
Buskar generellt	0,2		300	60
Bärande buskar	0,4		50	20
Stora träd (stam >30)	2,4			0
Mellanstora träd (stam 20-30)	1,5	3	125	188
Små träd (stam 16-20)	1	5	125	125
Ek	3	3	75	225
Bärande träd	0,4	5	125	50
Baggholkar	2	2	50	100
Fågelholkar	2	4	100	200
Faunadepåer	2		50	100
Tilläggsfaktorer grönska/rekreativa & sociala värden				
Gräsyta användbar för bollspel och lek	1,2		75	100
Odlingsytor på gården	0,5			0
Balkonger och terrasser förberedda för odling	0,5		0	0
Gemensamma takterasser	0,2		0	0
Synliga gröna tak	0,1		500	50
Blomsterprakt	0,2		200	40
Buskar upplevelsevärde				
Bärande buskar med ätliga frukte				
Träd, upplevelsevärden				
Fruktträd och blommande träd				
Pergolor, lövgångar m.m. med gr				
Fågelholkar, upplevelsevärden				
Tilläggsfaktorer grönska/klimat-heat island				
Träd m lövskugga över lekplats m.m.	0,5	2	50	25
Pergolor, lövgångar m.m. som ger lövskugga	0,5		160	80
Gröna tak, flerskiktad markgrönska - temp.utj.	0,1		500	50
Delfaktorer vatten				

Total area **5.200 m2**
Building area **3.300 m2**
Yard **1.900 m2**

Green ground 750 m2
Pond /wetland 50 m2
Green roofs 500 m2
Green walls 500 m2
3 oaks (medium size)
5 trees with berries
6 nesting boxes (birds, bats, beetles)

Deep soils
grass for playing
Flowers, bushes

……

Total = 3.120

3.120/5200=0,6

Calculating the green area factor = Ecologically effective surface area / Total land area = **0,6**

CITY OF STOCKHOLM

09/11/2011
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3. Steering Committee for Climate Adaptation

Develop a local Climate and Vulnerability Analysis
Include it in Stockholm's Risk and Vulnerability Analysis.
Plan for further adaptation measures in the entire city

CITY OF STOCKHOLM

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Conclusions

- Need for climate adaptation identified
- Some actions taken
- Need for further action and updated information

Reports

www.stockholm.se/klimat

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