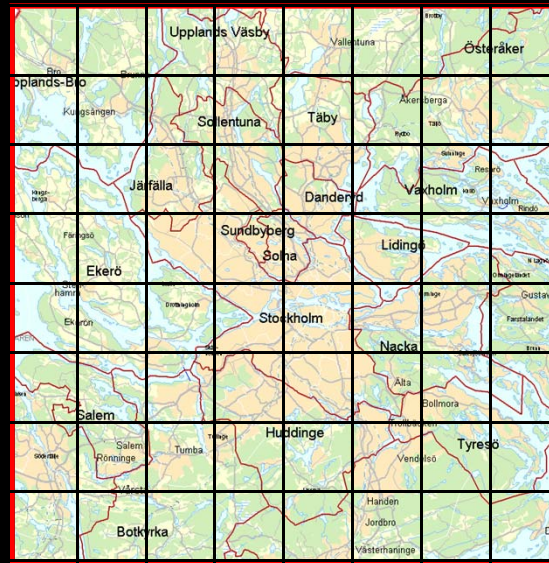


# Ger högre rumslig upplösning bättre nederbördsfördelning?

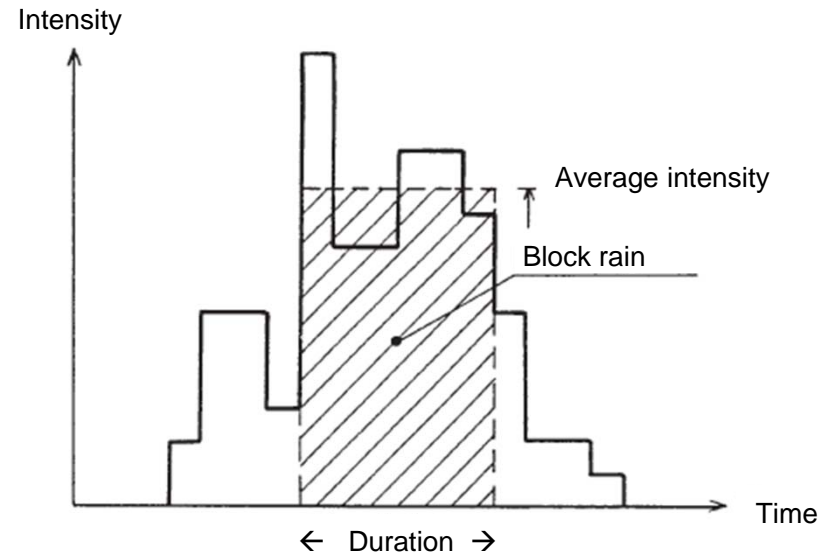


Jonas Olsson, Kean Foster

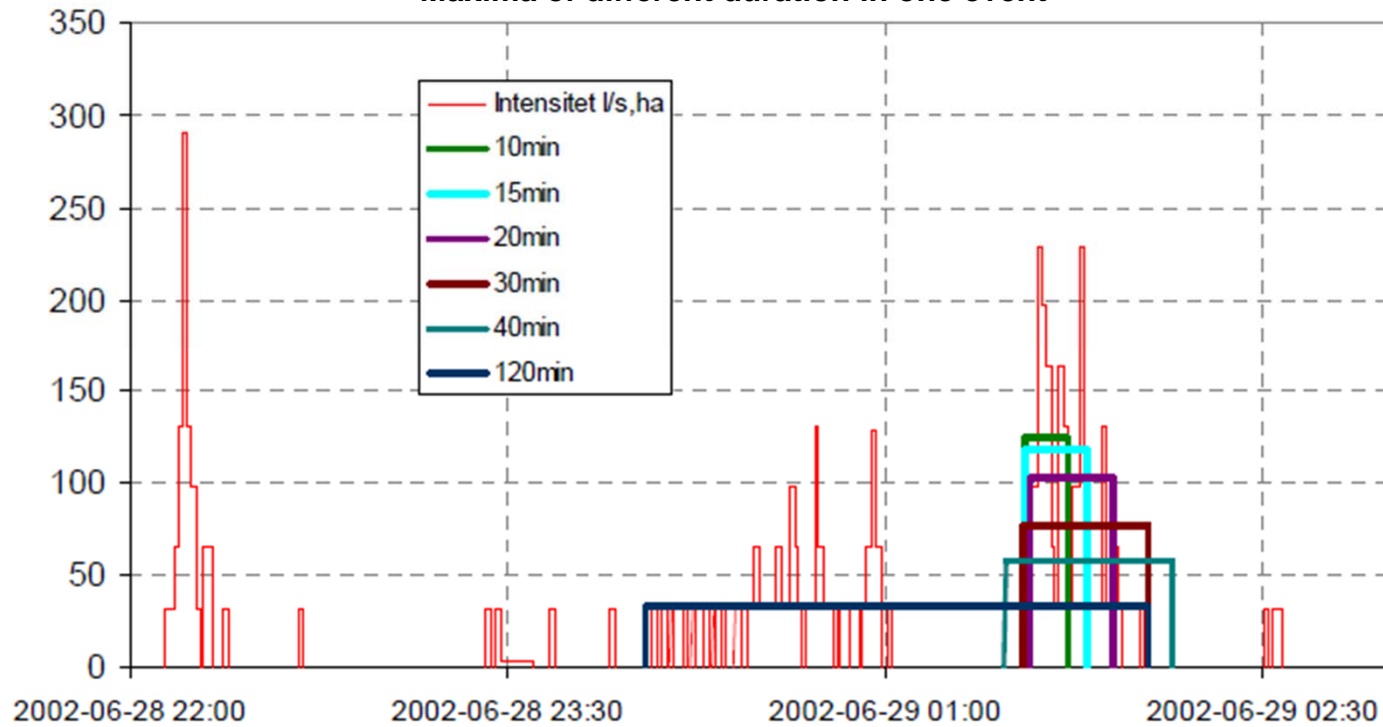
Forskning och Utveckling (hydrologi)  
SMHI

# Block rains

From short-term observations  
( $\leq 30$  min)



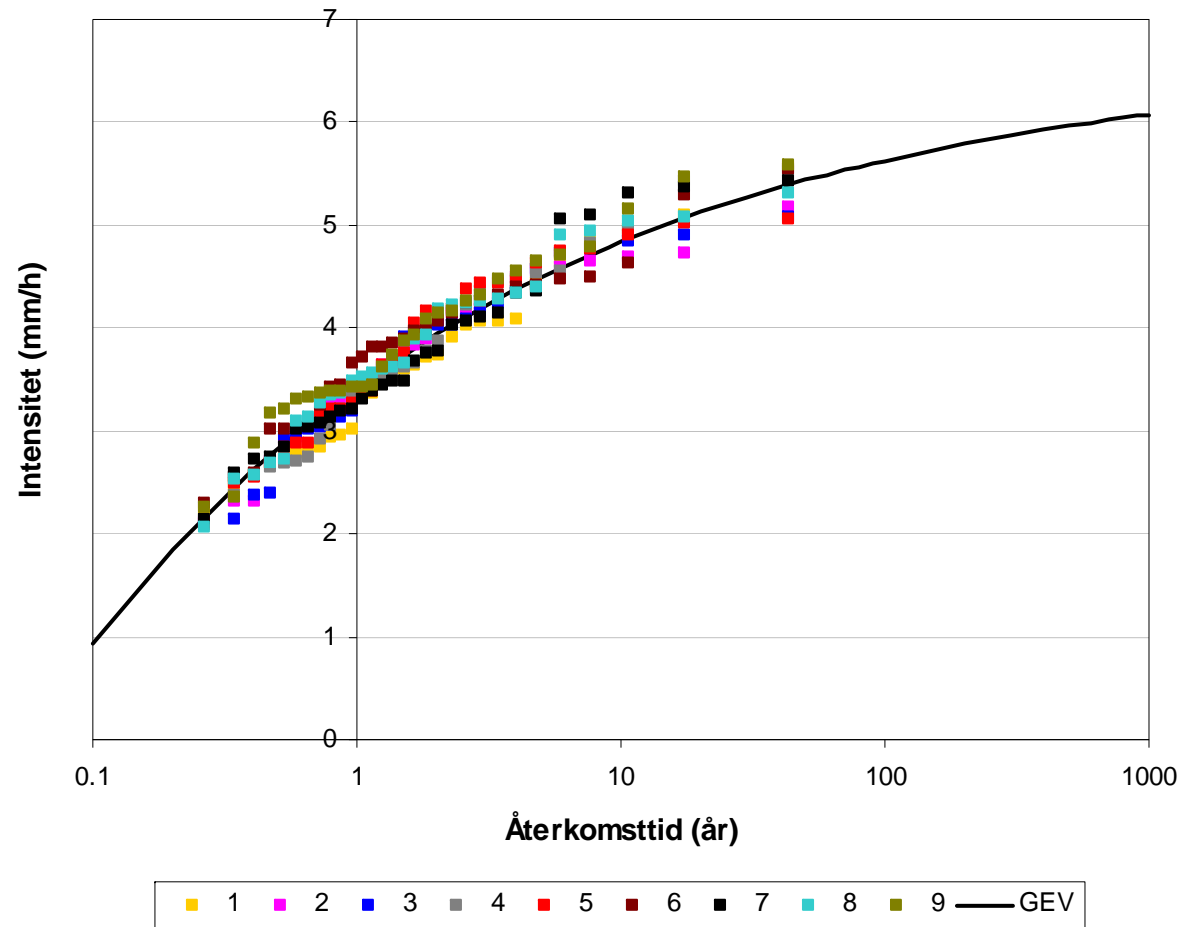
Maxima of different duration in one event



# Annual maxima of different duration

	30 min	1 h	2 h	3 h	6 h	12 h	24 h
1971	3.445	3.682	6.584	7.639	12.171	21.823	31.224
1972	1.752	3.493	6.87	10.02	17.73	25.046	31.487
1973	1.567	2.718	5.36	7.787	13.935	23.6	31.281
1974	2.114	3.886	7.15	10.17	18.206	23.19	26.136
1975	1.705	3.087	6.063	8.791	15.426	21.076	26.661
1976	2.454	3.626	6.575	8.835	17.053	23.554	29.273
1977	1.846	2.654	5.289	7.868	15.121	26.557	39.433
1978	1.757	3.12	5.898	8.423	12.772	18.998	29.549
1979	1.941	2.804	5.303	7.29	12.318	16.685	22.087
1980	1.429	2.852	5.657	8.393	15.613	23.252	26.9
1981	2.659	3.194	6.116	9.074	17.236	30.688	50.761
1982	2.457	4.836	9.488	13.588	22.767	30.317	31.412
1983	1.862	2.998	5.372	7.132	13.366	20.967	31.366
1984	1.826	2.99	5.754	8.375	14.891	23.1	27.969
1985	1.447	2.682	5.042	7.139	12.767	19.518	23.311
1986	1.565	2.869	5.466	7.926	13.334	21.891	33.999
1987	1.517	2.321	4.274	6.363	12.269	21.618	31.628
1988	2.803	4.015	7.922	10.452	17.204	21.67	29.158
1989	2.093	3.981	7.814	10.918	16.928	19.818	27.788
1990	1.786	2.359	4.499	6.717	12.808	21.209	34.558
1991	1.727	3.144	6.124	8.991	16.446	25.749	39.961
1992	1.905	3.537	6.599	9.053	12.577	20.15	31.082
1993	2.17	3.559	7.071	10.494	19.645	31.761	37.79
1994	1.612	3.074	5.122	7.081	11.944	18.436	24.49
1995	1.994	3.946	7.812	11.17	18.292	22.434	23.692
1996	2.535	4.324	7.561	11.194	20.677	38.963	49.17
1997	1.66	3.259	6.399	9.183	15.1	20.657	26.046
1998	2.104	3.219	5.98	8.734	15.929	26.818	35.037
1999	2.286	4.524	8.756	12.771	23.432	37.358	47.048
2000	2.05	3.964	7.875	11.689	20.348	27.001	28.182

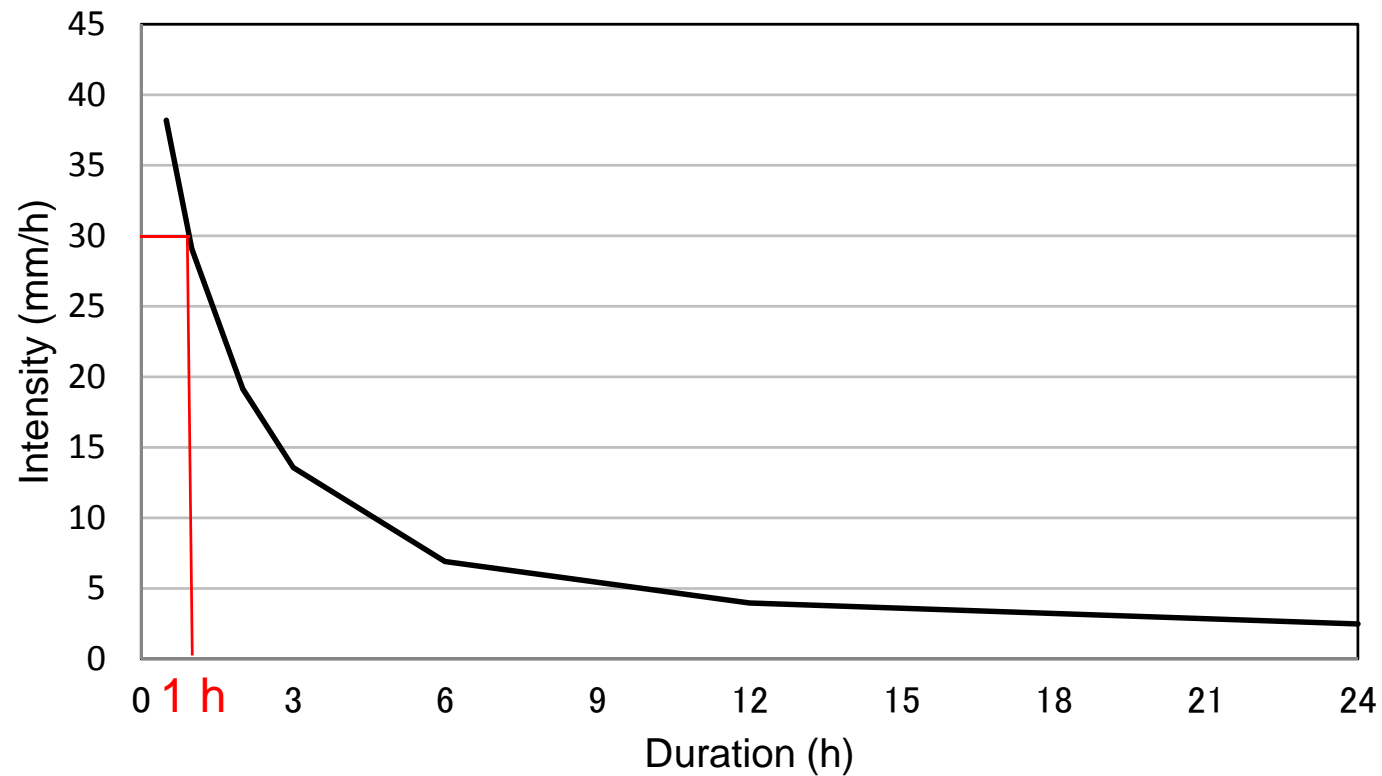
# Generalized Extreme Value distribution



# Intensity-Duration-Frequency (IDF) curve



10-year IDF Stockholm



# Intensity-Duration-Frequency (IDF) curve



Important tool in urban hydrological modeling and design



Calculated using point observations



in contrast to the climate models' gridbox averages



DF Stock

12  
Duration

# Data

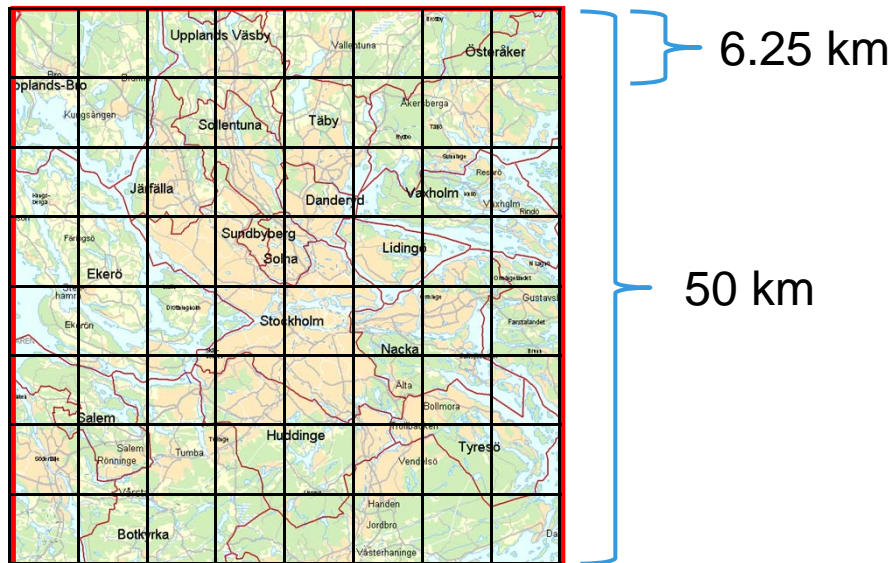
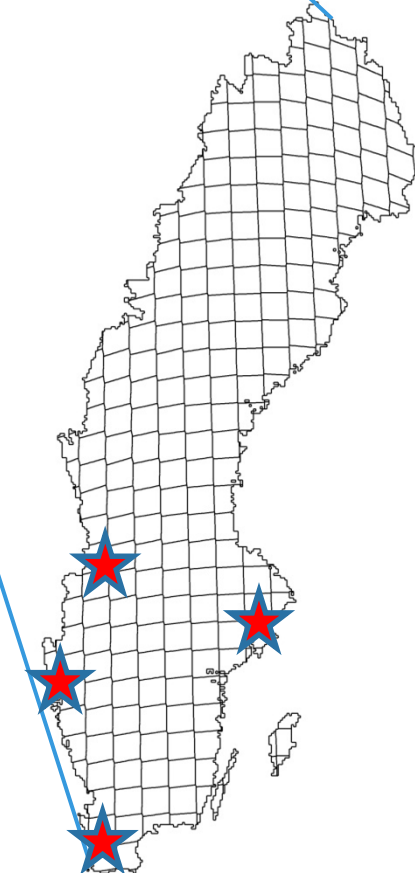
Locations: four cities in southern Sweden

Period: 1995-2010

Observations: 30-min automatic gauge

RCM data: - 30-min precipitation from RCA3 model with ERA40 boundary  
- resolutions 50, 25, 12.5, 6.25 km  
- 3x3 grid boxes

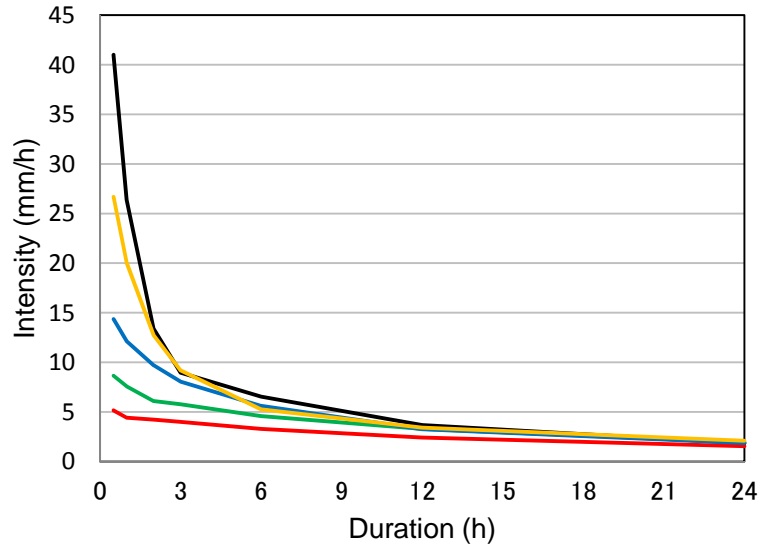
**SMHI**



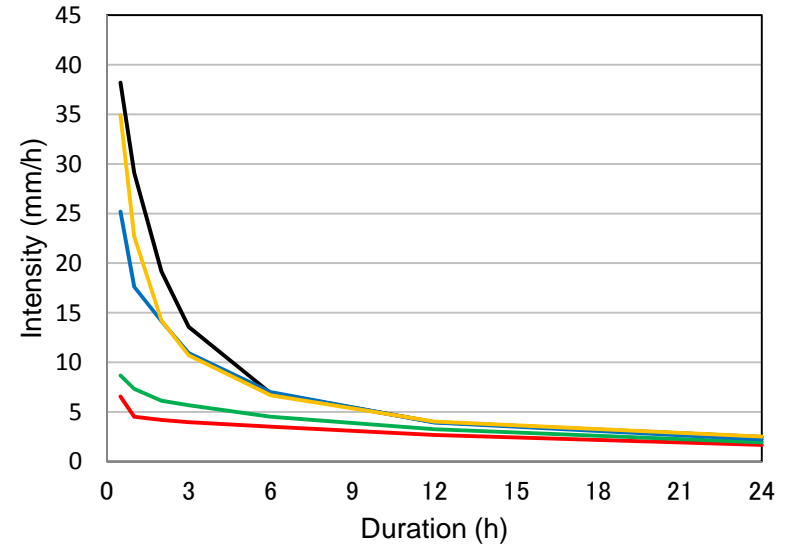
# Results



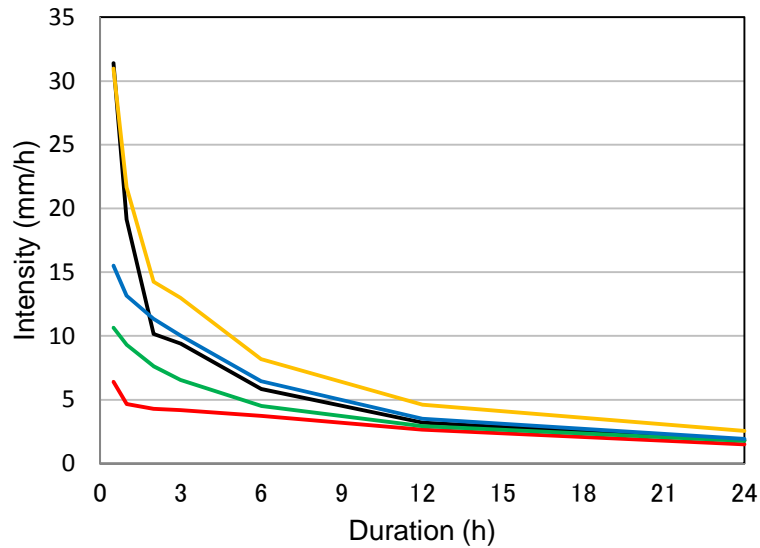
### Arvika



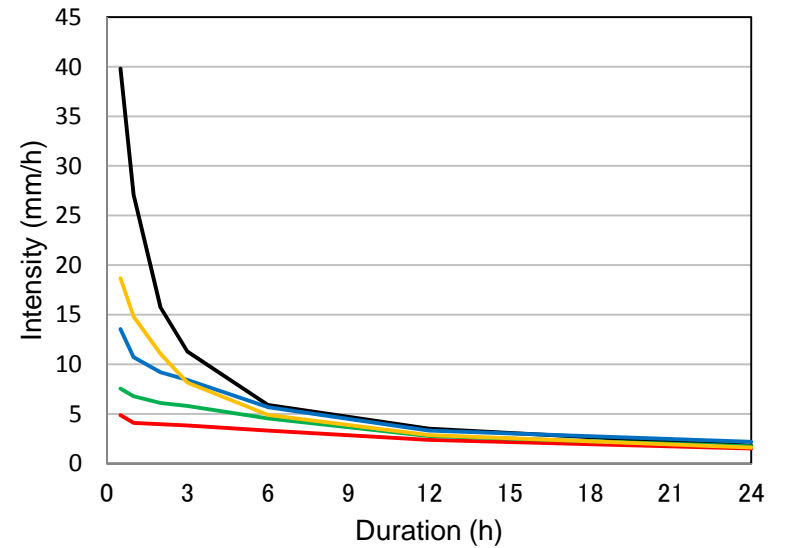
### Göteborg



### Malmö



### Stockholm





## Future work

- Uncertainty analysis
- Regional differences
- Future projections



**MISTRA SWECIA**  
CLIMATE, IMPACTS & ADAPTATION



# HYDROIMPACTS 2.0