



ILMATIETEEN LAITOS  
METEOROLOGISKA INSTITUTET  
FINNISH METEOROLOGICAL INSTITUTE

# **Ilmastonmuutos ja ilmastopalvelut finanssialalle**

Seminaari 17.4.2019

Ilmatieteen laitos

17.4.2019



# Ohjelma ja tarkoitus

09.00	09.10	Tervehdys ja johdanto	
09.10	09.40	Finanssialan haaste integroida ilmastonmuutoksen vaikutukset toimintaansa – mikä on tietotarve? - Esko Kivisaari (varatoimitusjohtaja Finanssiala ry)	<ul style="list-style-type: none"><li>• Ilmastopalvelujen mahdollisuudet</li><li>• Tarve minkälaisiin Ilmastopalveluihin</li><li>• Toimitus(vaihto)ehdot</li><li>• Yhteistyömuodot ja -edellytykset</li><li>• Tietojen jakamisen edut ja rajat</li></ul>
09.40	10.10	ilmastotietojen ja palvelujen mahdollisuudet finanssialalle - Adriaan Perrels (tutkimusprofessori Ilmatieteen laitos)	
10.10	10.30	Esimerkkejä jo käytössä olevista ilmasto-palveluista ja niiden kehittämisestä - Hilppa Gregow (yksikköjohtaja Ilmatieteen laitos)	<p><b>Paneeli:</b></p> <p>Hanna Kaskela (Varma)</p> <p>Esko Kivisaari (Finanssiala ry)</p> <p>Timo Tyrväinen (CLC)</p> <p>Hilppa Gregow (IL)</p>
10.30	11.10	Paneelikeskustelu + kysymykset yleisölle	
11.10	11.15	Loppusanat	

# Ilmastopalvelut - mitä???

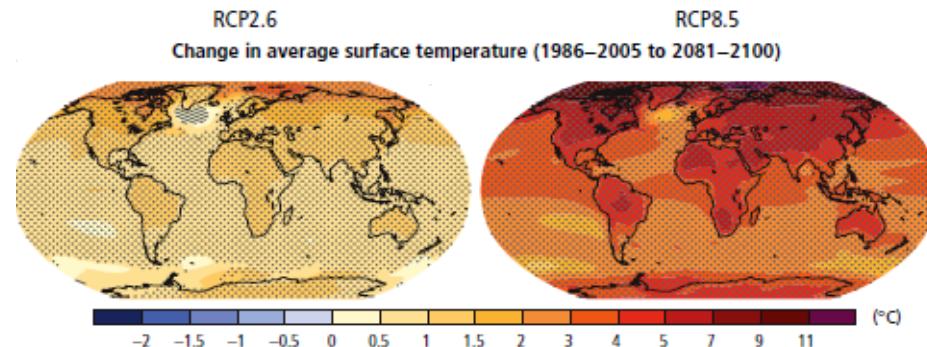
- EU: "... covers the transformation of climate-related data — together with other relevant information — into customized products such as projections, forecasts, information, trends, economic analysis, assessments (including technology assessment), counselling on best practices, development and evaluation of solutions and any other service in relation to climate that may be of use for the society at large. As such, these services include data, information and knowledge that support adaptation, mitigation and disaster risk management (DRM)"

- **Tuotetyypit – erilaiset käyttötarkoitukset & jalostusasteet**

- nykyisen ilmaston vaihtelevuus (esim. Ilmastokatsaus)
- Vuodenaikaisennusteet, esim.
  - meteorologiset luvut
  - lumipeite laskettelalueessa; kasvukauden alku; vesialtaan täyttöaste
  - hurrikaanikauden intensiivisuus
- Ilmastonmuutosskenariot, esim.
  - meteorologiset luvut alueittain / globaali / jne.
  - Koilisväylän purjehduskelpoisuus v.2040
  - Vektoritautien levittäytyminen vuosikymmenittäin
- Ilmastokoulutus
- Ilmastokonsultointi



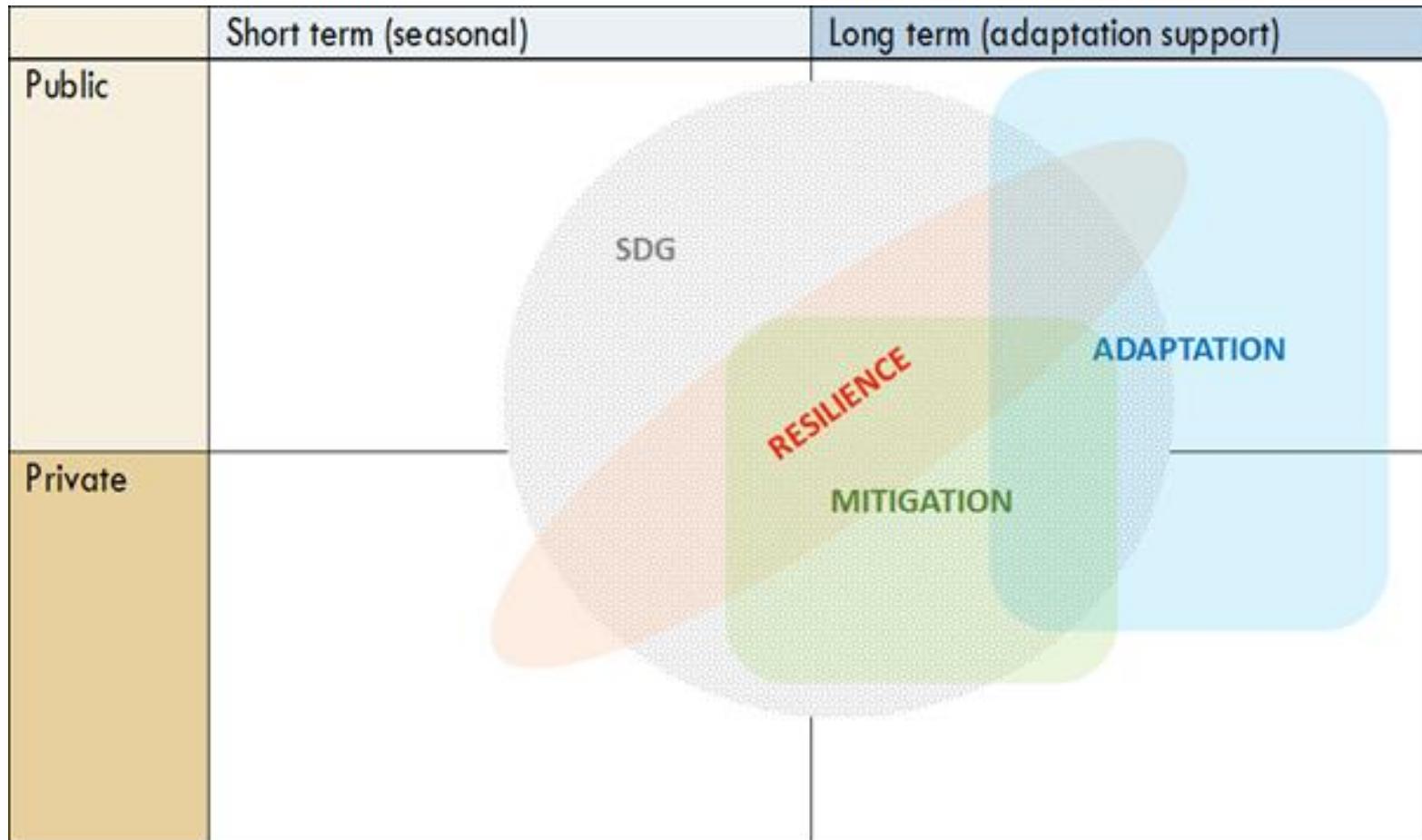
<http://www.ilmastokatsaus.fi/>



Lähde: IPCC, AR5, Summary of Policy makers

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# Ilmastopalvelut - draiverit



Lähde: [EU-MACS Deliverable 5.1](#)





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# ilmastotietojen ja palvelujen mahdollisuudet

17.4.2019 Adriaan Perrels



# Ilmastoriskit finanssialalle

- Nykyinen ilmaston vaihtelu ja ääripääät
  - Esim. jos uusi toiminta uudessa alueessa tai uudelle toimialalle
  - Hankekohtaiset riskit
- Ilmastonmuutoksen takia voimistuvat ja uudet riskit (+ ja -)
  - Tuottavuus riskit
  - Vahinkoriskit
  - Heijastusriskit
  - Kilpailukyvyn muutokset
  - Ilmastonpolitiikan aiheuttamat riskit
- Riskityypit
  - Fyysiset vahingot
  - Varallisuuden arvon menetys (ml. 'stranded cost')
  - Pääoman tuottavuuden muutokset (tuotanto  / kustannukset )
  - Markkinan menetys
  - Vastuullisuus / korjausvelvollisuus
  - Maine



# Ilmastoriskien käsittelyn vaihtoehdot

- Odottaa / toivoa että toinen (valtio) hoitaa jos sattuu jotain
- Siirtää kustannukset asiakkaille
- Vakuutus ja samankaltaiset mekanismit
- Vähentää tai välttää riskialtista omistusta ja kauppatoimintaa
- Toimenpiteet ilmastoriskien vähentämiseksi
- Koulutus ilmastoriskeistä ja niiden käsittelystä
- Ilmastoriskien (lähteiden) seuranta

Käsittelyn tyypin  
ja tason valinta  
vaati tietoa

# Miksei (vielä) ilmastopalvelu?

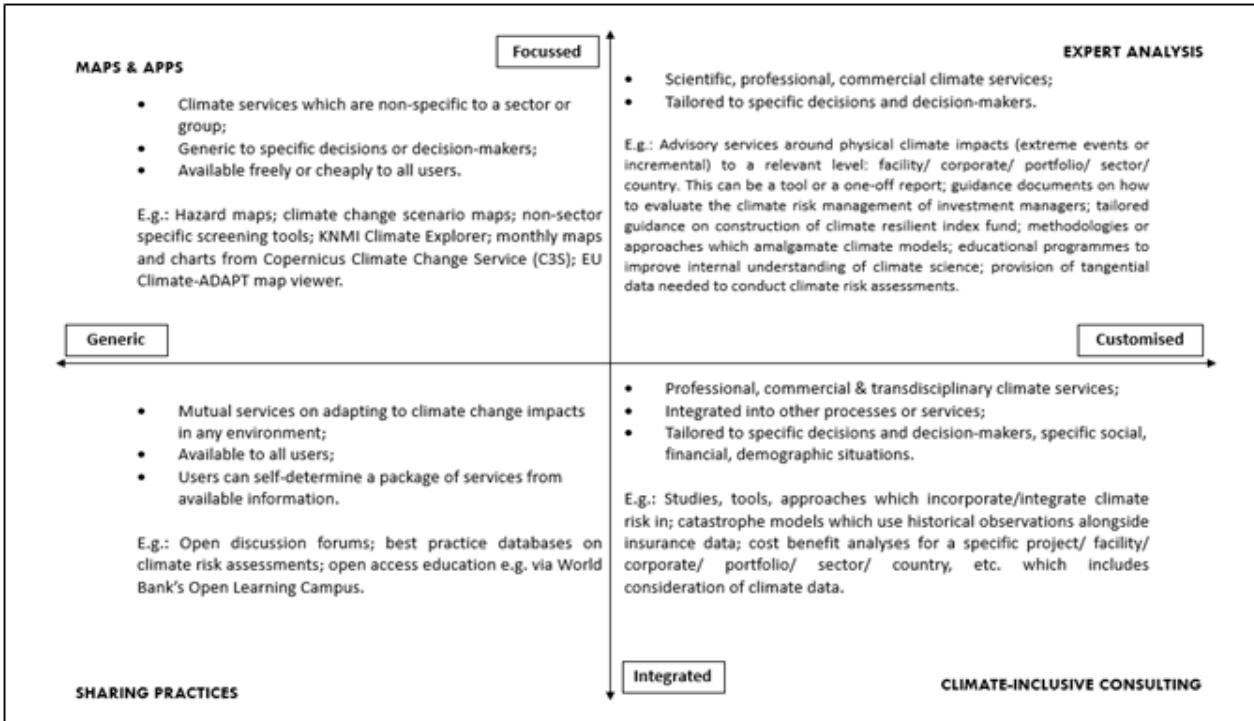
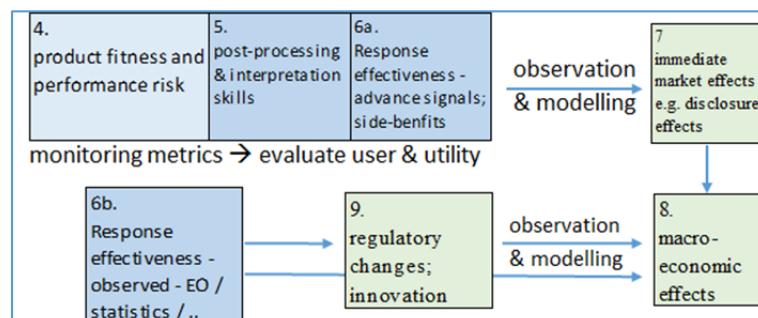
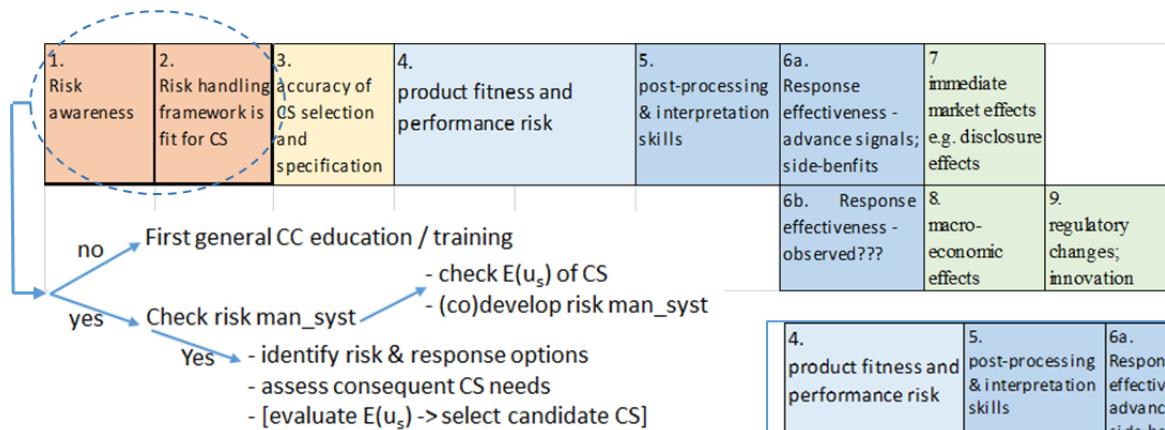
Demand:	ALL	Priv. banks	Supply:	ALL	Priv. banks
(preliminary) impact projections are of minor importance compared to many other risks	12	9	available CS information is not really packaged as service (but e.g. rather as R&D project output)	12	12
inherently short term oriented business model (ruling out adaptation CS)	12	9	CS product portfolio is totally or largely out of scope for the user group	9	8
no clue about how such information could be used in decision making (i.e. no risk management)	10	12	insufficient resourcing of CS product development and delivery	9	6
lack of awareness of climate change or (seasonal) climate variability or climate information (as regular input for decision making)	9	9	CS provider faces legislative limits regarding product or user segments it is allowed to service	8	-
lack of incentives (e.g. if costs are (expected to be) fully compensated)	6	10	lack of understanding of user characteristics	8	8
perception that responsibility rests fully on other actors	6	6	CS provider does not employ clear product profile or client type profile	7,5	8
denial of climate change	4	1	no interest or capability to develop CS beyond mere data provision	6	8
acquisition and/or use of CS is expected to be too expensive, leading to reduced or non-exercised demand	2	1	<b>Matching:</b>	ALL	Priv. banks
(public) acknowledgement of climate risks is seen as risky for (local) business development (e.g. tourism)	1	1	mismatch of provider's and user's 'language' and conceptions	12	16
perception that there are no response options (fatalism or gambling)	1	1	uncertainty about the eventual relevance of the CS for the user's decision process ('fit for purpose')	12	9
Lack of internal coordination	*	8	temporal and/or spatial resolutions do not match with other user's data	12	12
			insufficient guidance and/or embedded consultancy	10	12
			hard to specify CS needs	7,5	9
			unclear where to look for CS services (if NMS cannot deliver)	6	12
			Lack of climate service data processing skills (no GIS capacity)	**	16

Lähde: [EU-MACS Deliverable 5.1](#)

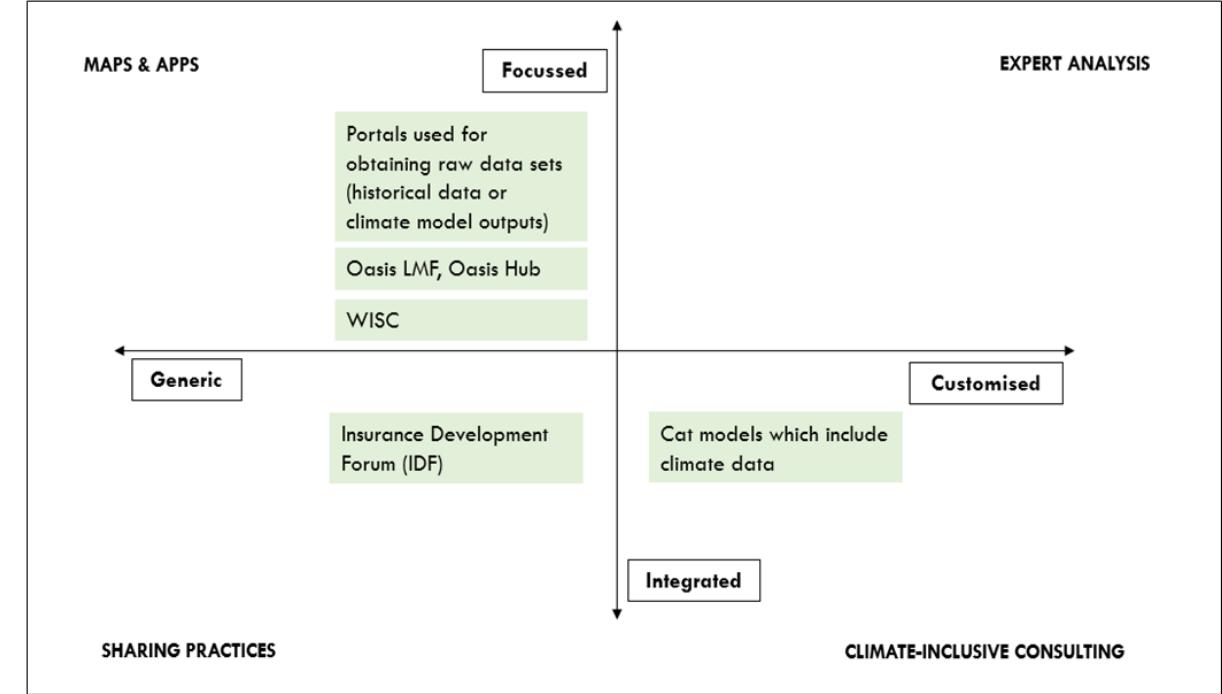
# Ilmastopalvelun valintatavat



Välitys & neuvonta – esim. [OASIS Hub](#)



# Ilmastopalvelutuotematriisit - vakuutus / pankit



**EU-macs**

**OTHER PROJECTS**

In the context of the H2020 and JP-EUmacs programmes there are quite some projects going on dealing with developing and piloting of climate services and with promoting the uptake of climate services. Via this page you find links to a select few of these ongoing projects, as well as to a few concluded projects.

Below are links organized by sectors to other, mostly ongoing, climate services development projects.

**A. PRODUCT MATRIX COMMERCIAL BANKS**

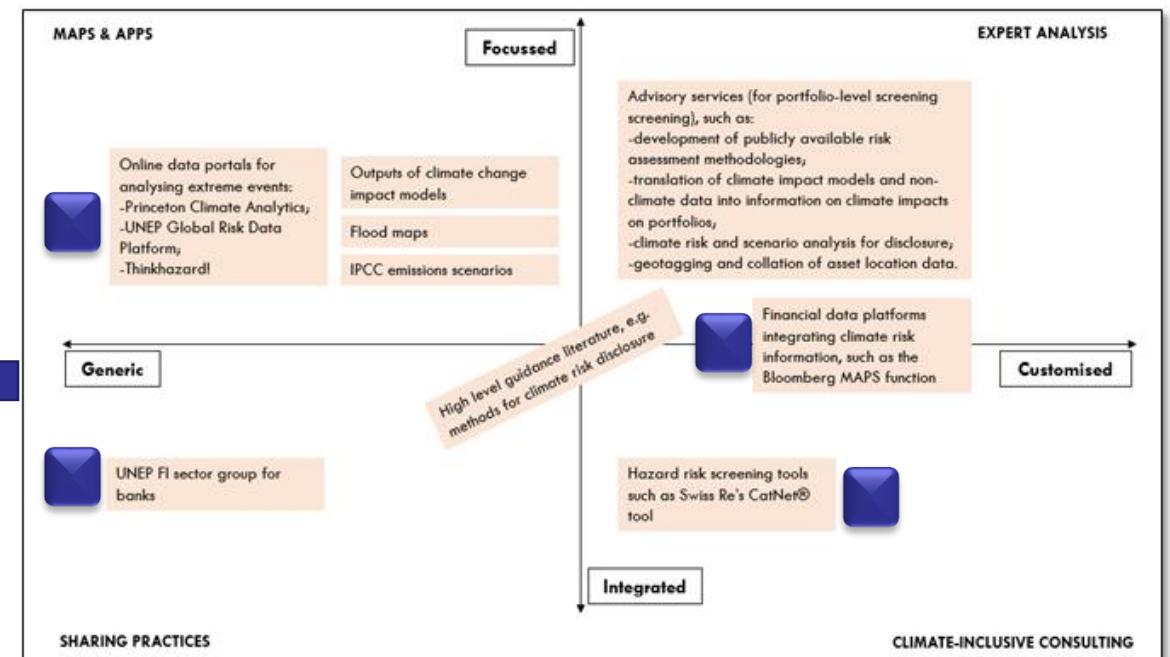
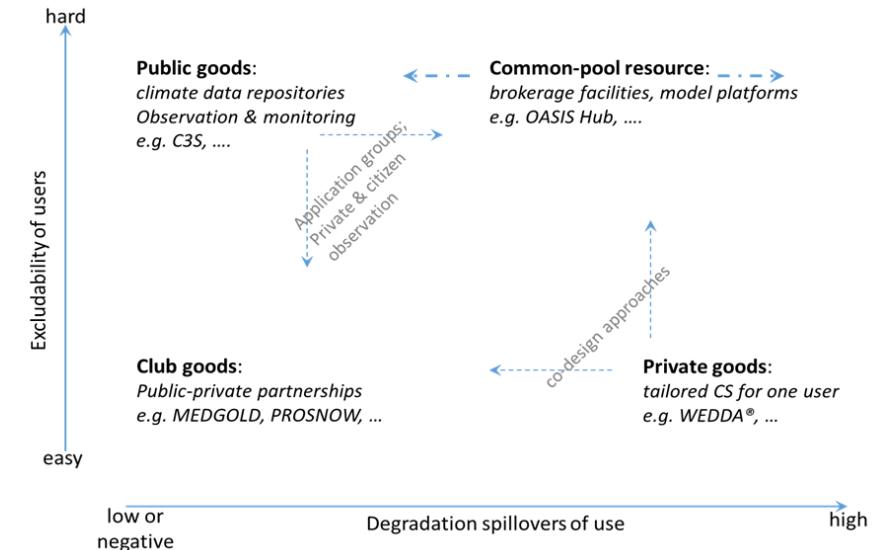
Using the climate services product matrix to guide initial choice

1. Commercial banks:  
 a. Product matrix supporting services  
 b. Product matrix commercial banks  
 c. Product matrix insurance  
 d. Diversifying banking  
 e. Liabilities

2. Other climate services:  
 a. What is offered?  
 b. What does it take to use climate services?  
 c. Product matrix commercial banks  
 d. Product matrix insurance  
 e. Diversifying banking  
 f. Liabilities

Actions at initial stages of their climate change risk & opportunities strategy may want to have a look at Maps & Apps and especially also Sharing Practices.

Links to external resources in these categories are:  
 MAPS & APPS:  
 - UNFCCC Climate Data Platform  
 - UNFCCC Greenhouse Gas Reporting



# Ilmastopalvelu vaati usein yhteistyötä

## Business models

CS is developed on the basis of a public grant, and intended CS is hoped to be effective enough to face positive WTP from users or state

**CS is developed in conjunction with private or club-based observation capacity**

As part of basic service of a public organisation and funded from the basic budget

Provision on the basis of a public service contract between a public organisation and one or more ministries

As a largely self-financing public service of a public organisation

**As a partnership of several public provider organisations augmenting the value of the services by adding complementary data and information**

**As a partnership of both service providers and users to provide tailored, often co-designed, information to users (and also back to providers) (PPP or PuPuP)**

**Multistage CS development and use partnership (PPP)**

**CS offerings and matching facilitated by a CS brokerage**

CS provided and charged as private service – subscription based

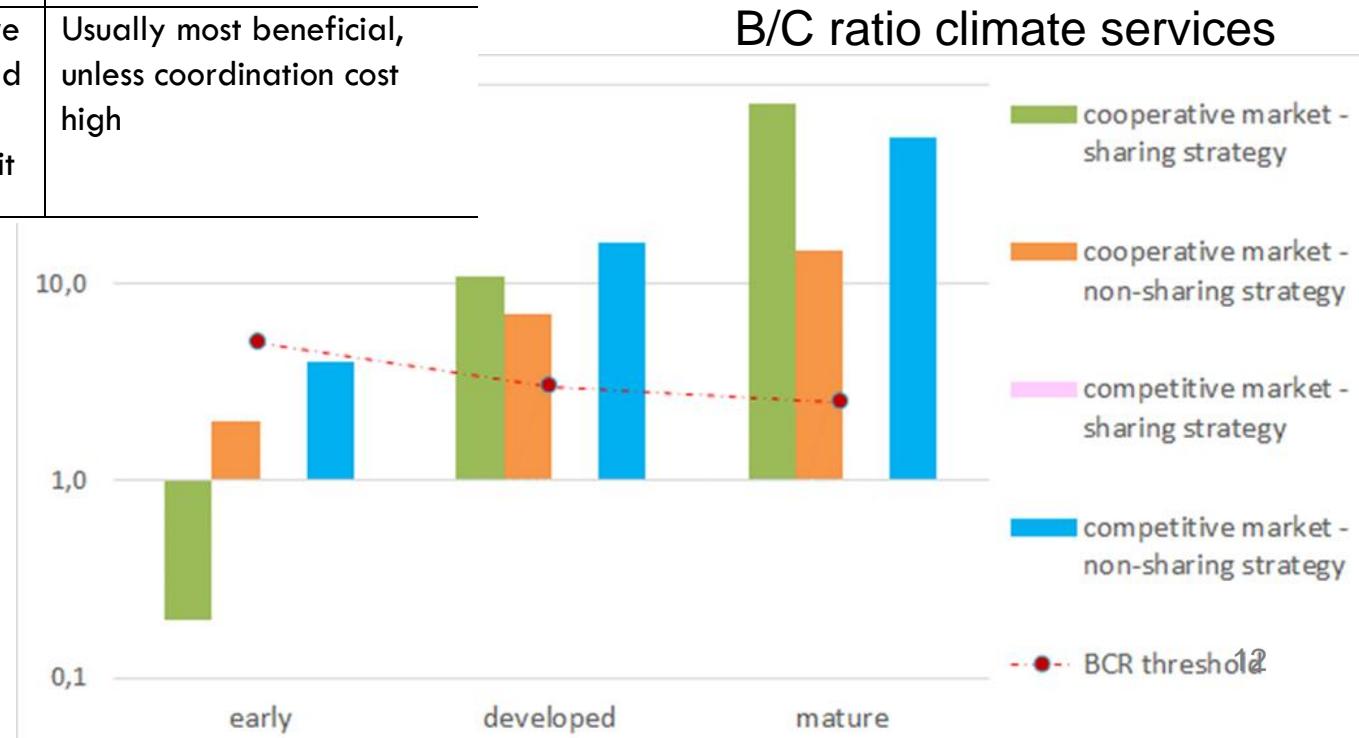
CS provided and charged as private service—case wise consultancy contracts

Lähde: [EU-MACS Deliverable 5.2](#)

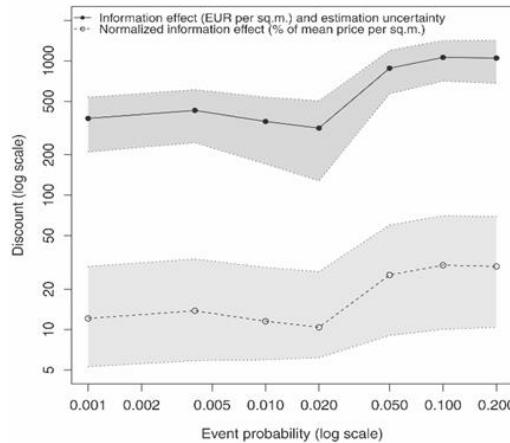
# Tietojen avoin käytön edut ja rajoitukset

	<b>1. If information is common competitive advantage diminishes</b>	<b>2. If information is (more) common, credibility and hence value rises</b>	<b>3. If information is common more options for joint benefits</b>
<b>Information is not shared, but can be acquired by others</b>	In case of public source information copying will emerge soon; Private (tailored) CS may lengthen period with advantage	Even if eventual products have also competitive elements, equally accessible basic layers would help uptake; coordination problem due to reluctant single movers	Separate acquisition leads to higher aggregate acquisition cost and risks for mismatches; only relevant if coordination cost are high
<b>Information is shared already in acquisition</b>	Irrational strategy, unless there are other benefits in sharing	As above but may need more time to realise; may also lead to shake out at CS provision side as uniformity is a benefit	Usually most beneficial, unless coordination cost high

- *Edut riippuvat asemasta arvoketjussa*
- *Julkisen ja yksityisen palvelun kilpailun säättely*
- *Suuret mittakaavaedut*
- *Kustannukset vain ratkaiseva alkuvaiheessa*



# Pitkääikaisvaikutkset tulvariskien julkaisusta



price correction of houses (per  $m^2$ )  
after public disclosure of flood risk

What are upper and lower bounds  
of well understood probabilities?

When and how changes in these  
get accounted for ?

Is it applicable to other amenities?  
(air quality, noise, ...)

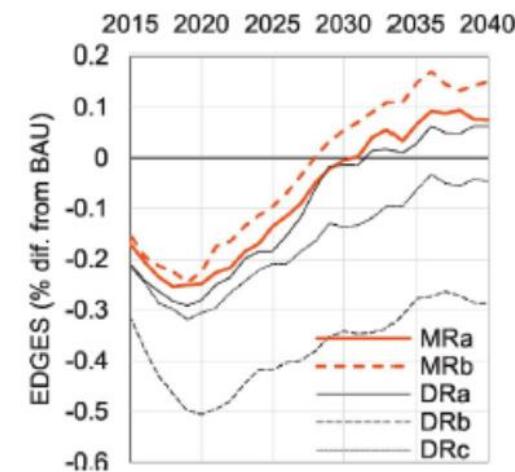
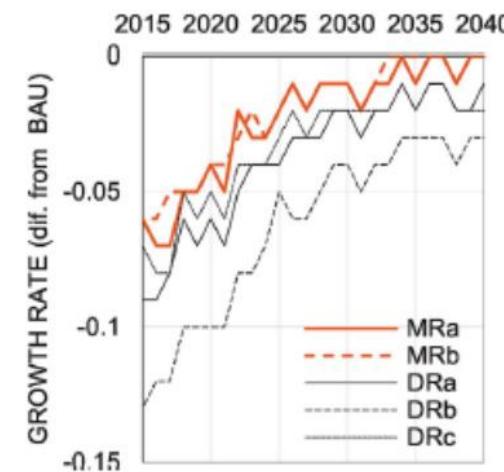
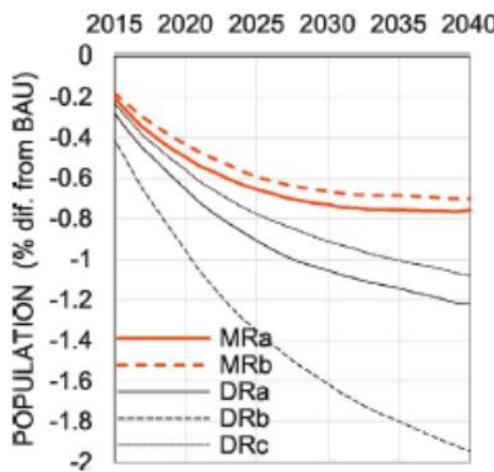


Fig. 7. Deviations from BAU in the amount (left) and growth rate (center) of built-up land production, and in the amount of produced urban-nonurban edges (right).

Long term urban  
development  
effects of choosing  
(risk) information  
led (MR) land-use  
development or  
absolute zoning  
rules (DR)

Lähde: Votsis and Perrels 2016; Votsis 2017

# Ilmastopalvelumarkkinan näkymät - Euroopassa

- Nykyinen kokonaisarvo 1.5 .... 4 miljardia €
- Vuosittainen kasvu 4% ... 7%
- Muutamat ohjauskeinot voivat nopeuttaa kehityksen
  - riskiraportointivelvoitteet finanssialalla
  - riskiarvointivelvoitteet kaupungeille ja infrastruktuurille
  - standardisointi ja laatuvarmennus
  - avoin data direktiivien toimeenpano (PSI; INSPIRE)
  - etujen arviointimenetelmät
  - avoin monitorointi-ohjelma ja –portaali ("Observatory")

# Lähteet

1. Votsis, A., Perrels, A. (2016). Housing prices and the public disclosure of flood risk: a difference-in-differences analysis in Finland, *Journal of Real Estate Finance and Economics*, November 2016, Volume 53, Issue 4, pp 450–471
2. Votsis, A. (2017). Utilizing a cellular automaton model to explore the influence of coastal flood adaptation strategies on Helsinki's urbanization patterns, *Computers, Environment and Urban Systems* Vol. 64, pp.344–355
3. Hamaker-Taylor, R. Perrels, A. Canevari, L., Nurmi, V., Rautio, T. Rycerz, A. Larosa, F. (2018). Results of Explorations of the Climate Services Market for the Financial Sector, EU-MACS Deliverable 2.1, 23.12.2018. <http://eu-macs.eu/outputs/#>
4. Perrels, A. A Structured Analysis of Obstacles to Uptake of Climate Services and Identification of Policies and Measures to Overcome Obstacles so as to Promote Uptake, EU-MACS Deliverable 5.1, 02.12.2018. <http://eu-macs.eu/outputs/#>
5. Stegmaier, P., Perrels, A., Dammn, A., Cortekar, J., Hamaker-Taylor, R., Larosa, F., Harjanne, A., Giordano, R., Lamich, K., Pilli-Sihvola, K., Gregow, H., Tuomenvirta, H. 2019, Policy Implications and Recommendations on Promising Business, Resourcing, and Innovation for Climate Services, EU-MACS Deliverable 5.2. <http://eu-macs.eu/outputs/#>

# kiitos

The screenshot shows the homepage of the Finnish Meteorological Institute (Ilmatieteen Laitos) in Finnish. The search bar at the top contains the query "Hae sääennuste Suomeen tai ulkomaille". The search results page displays a list of articles related to climate research, with the first result being "Sää ja ilmastonmuutoksen vaikuttustutkimus" (Research on the impact of climate change). The article summary includes contact information for the lead researcher, Dosenti Hilppa Gregow, and a photograph of a fallen tree in a forest.

<https://ilmatieteenlaitos.fi/saan-ja-ilmostonmuutoksen-vaikutustutkimus>

The screenshot shows the homepage of the Copernicus CLIM4ENERGY website. The header features the Copernicus logo and navigation links for CLIM4ENERGY, ENERGY & CLIMATE, CASE STUDIES, PRODUCTS, THE SCIENCE BEHIND, and ABOUT US. A large image of Earth from space serves as the background. Below the header, there is a section about the 2nd Copernicus C3S Symposium, followed by four main menu categories: Climate & Energy, Case studies, Data & Products, and The science behind, each with corresponding icons and brief descriptions.

<http://clim4energy.climate.copernicus.eu/>

The screenshot shows the homepage of the EU-MACS project. The header includes the EU-MACS logo and navigation links for ABOUT, SECTORS, NEWS, CO-OP PROJECTS, NEWSLETTER, and OUTPUTS. The main content area features a dark blue banner with the text "3. WHAT DOES IT TAKE TO USE CLIMATE SERVICES?" and several circular icons representing different sectors. Below the banner, there is a section titled "What does it take to start using climate services?" with a list of bullet points and small explanatory text. At the bottom, there are sections for "MAPS & APPS" and "EFFECT ANALYSIS".

<http://eu-macs.eu/outputs/#>

The screenshot shows the homepage of the INDECIS project. The header includes the INDECIS logo and navigation links for PARTNERS, NEWS, PROJECTS, and CONTACT. The main content area features a large image of autumn leaves against a blue sky. Below the image, there is a section titled "Integrated approach for the development across Europe of user oriented climate indicators for GFCs high-priority sectors: Agriculture, disaster risk reduction, energy, health, water and tourism". The INDECIS logo is prominently displayed. On the right side, there are sections for "Partners", "Tweets", and "Indecis Calendar".

<http://www.indecis.eu/>