



Monitoring climate change adaptation in Scotland:

Developing indicators and baselines



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climate  change

- **The Scottish Government's *centre of expertise* on issues relating to climate change and the transition to a low carbon economy.**



What is ClimateXChange doing to monitor climate change adaptation?

- ClimateXChange is developing **indicators and baselines** to monitor climate change adaptation in Scotland.
- To support national level **adaptation policy and decision making** – in Scottish Government.
- Indicators cover a **wide range of sectors**.
- First - **agriculture, biodiversity and forestry**. Then – e.g. built environment and transport.
- **Cross-sector impacts** – e.g. water management – quantity and quality.

What is the purpose of the indicators?

- The indicators will be used to support the **Scottish Adaptation Programme** and wider **adaptation decision-making** in Scotland.
- Facilitate a clear understanding of the **risks and opportunities** that are driving the need for Scotland to adapt.



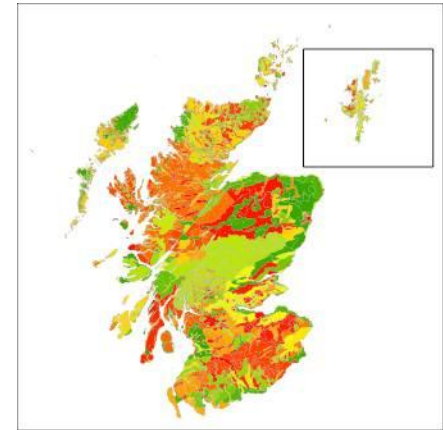
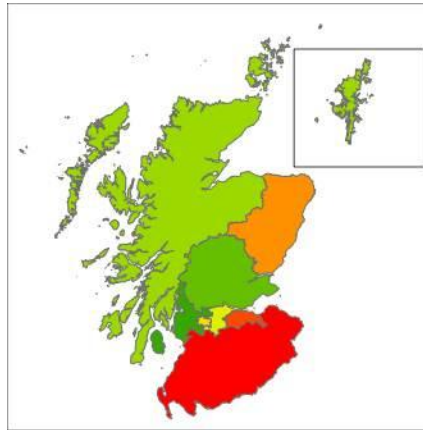
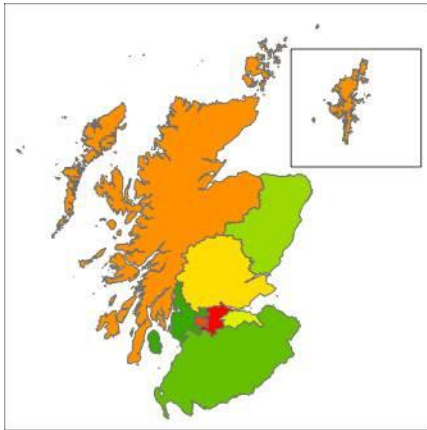
What is the purpose of the indicators?

- Understand whether adaptation actions are achieving **desired outcomes and policy objectives** i.e. are they reducing the risks and maximising opportunities of climate change?



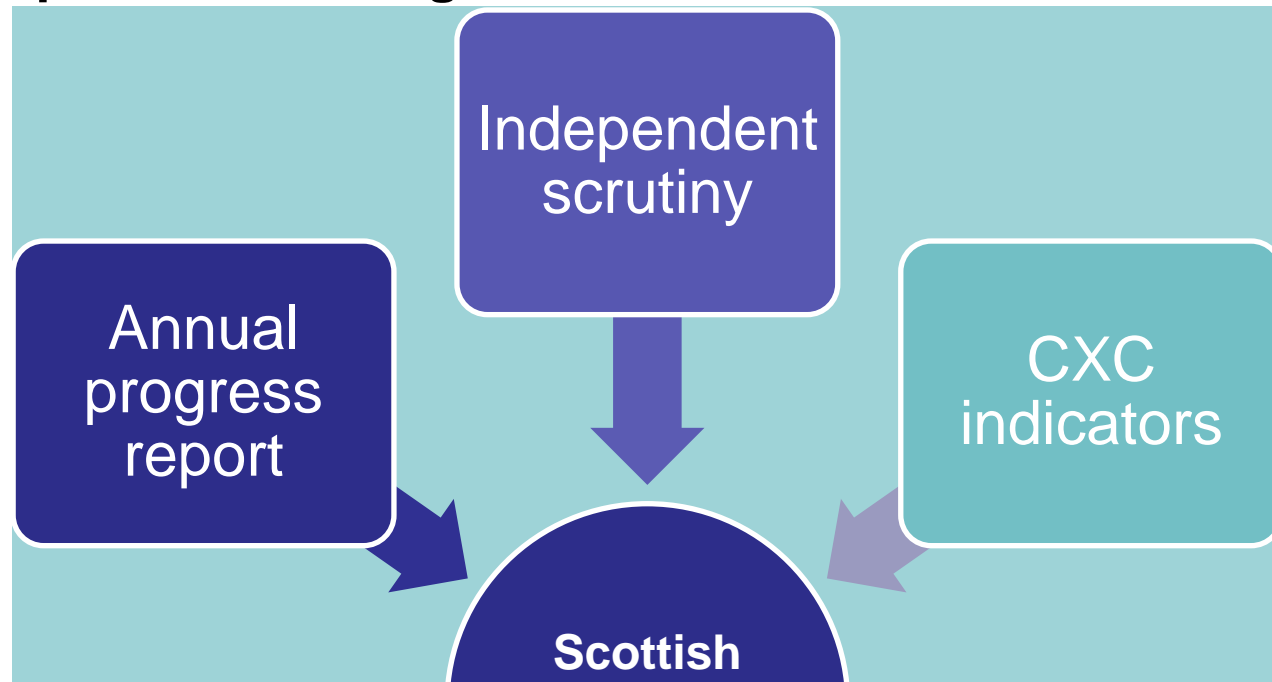
What is the purpose of the indicators?

- **Prioritise areas for adaptation action** and for adaptation policy by identifying areas of most risk or opportunity and how these change according to different scenarios or changing policy.



What is the relationship of the indicators to policy?

- **Sit logically** within other government programmes
- **Separate to** Scottish Government's formal monitoring and reporting
- But **compatible and integrated** with it



CXC indicators focus on analysing the scientific evidence of adaptation – to understand and inform adaptation policy

Indicators based around climate change risks and opportunities

- **Using risks and opportunities addressed in the Scottish Adaptation Programme.**

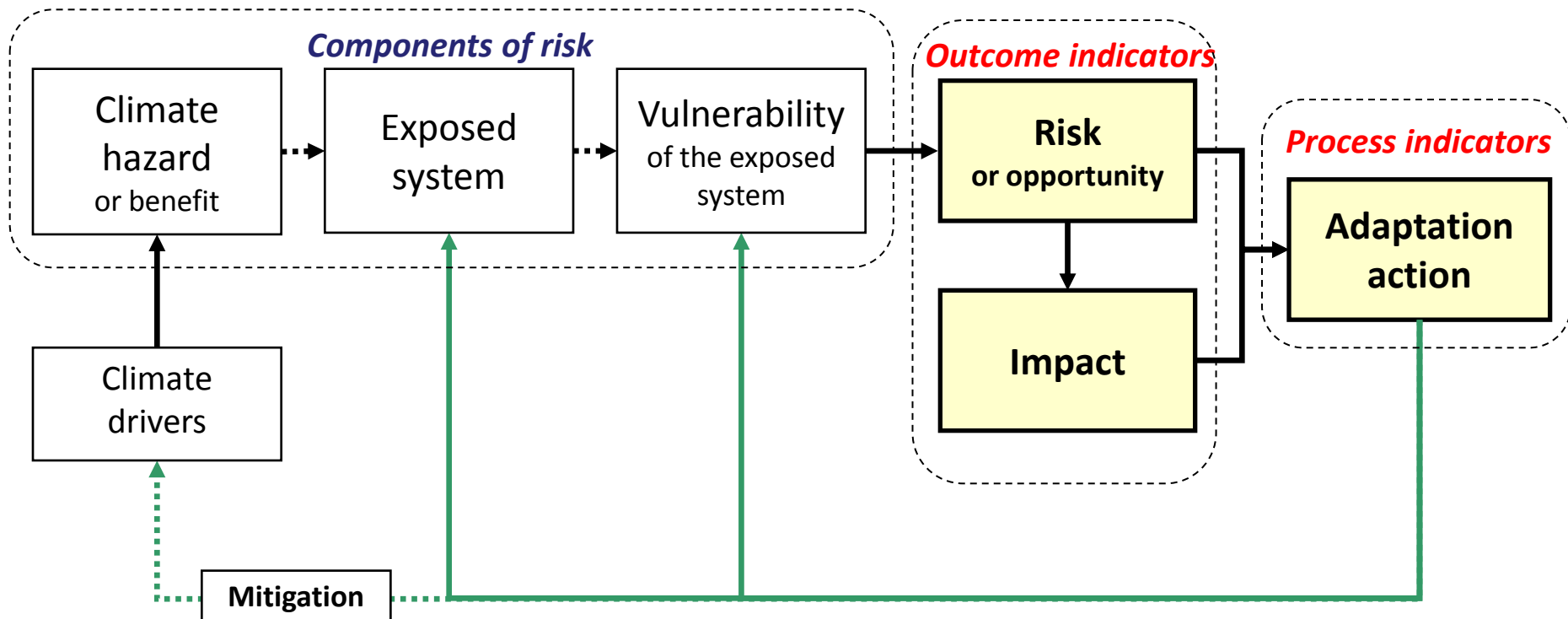
Risk and opportunities:

- **Pests and disease risks** – to trees, agricultural crops and natural environment
- **Species and crop suitability risks and opportunities** – changing suitability
- **Wildfire and wind throw risk** – to trees
- **Flood risk** – buildings, transport routes and prime agricultural land



The adaptation indicator framework

- **Risk-based approach**, setting adaptation indicators within the wider systems in which adaptation will occur.



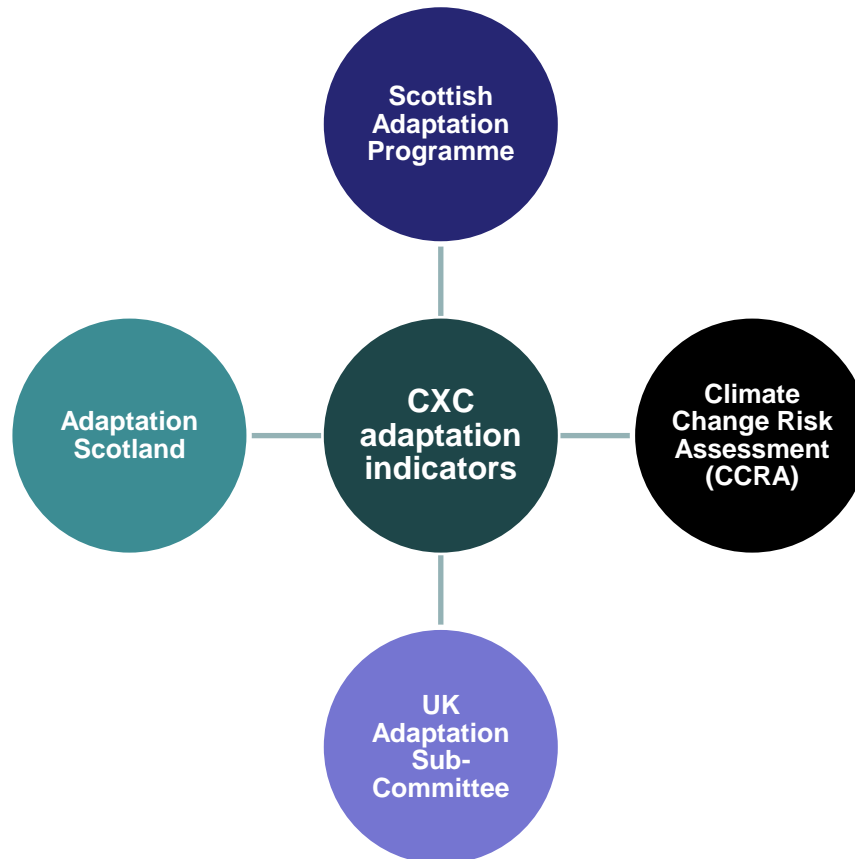
Outcome indicators: to monitor the underlying risk or opportunity that requires adaptation and the felt impact of those risks and opportunities

Process indicators: to monitor adaptation actions and processes aimed at impacting upon the risk/opportunity and hence positively altering the felt impact.

Adaptation indicators: challenges

- **Relationship to existing policy**- sit logically within other government programmes
- **Evolving policy** – flexibility required
- **Range of stakeholders** – early and on-going engagement

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Adaptation indicators: challenges

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Data issues

Uncertainty

- **Data gaps** (spatial and temporal)
- **Data quality** (relevant, robust, updated)
- **Time and costs** of obtaining data
- **Reducing uncertainty** should be an adaptation aim - uncertainty itself as an indicator

Data availability	High	M	H	H
	Medium	L	M	H
	Low	L	L	M
		Low	Medium	High

Data quality

Adaptation indicators: challenges

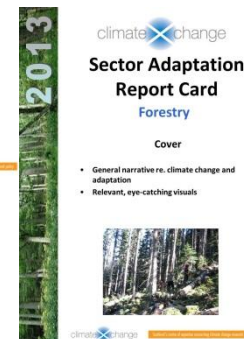
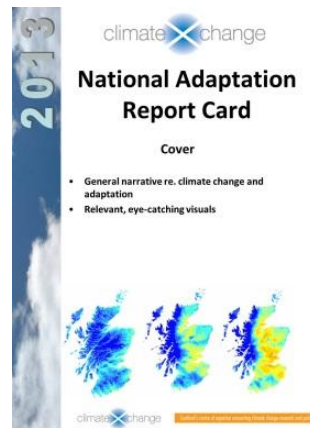
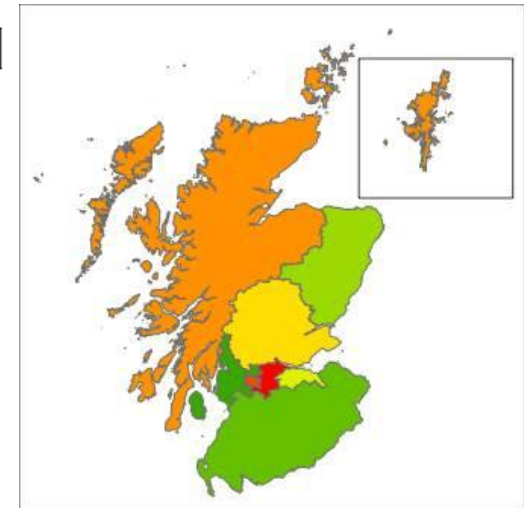
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Data issues

Uncertainty

Communication

Risk A			
	2020s	2050s	2080s
Indicator			
		Long-term trend	Short-term trend
Indicators of risk			Confidence level
		↑	→
		↑	↑
Indicators of impact			
		→	↑
		→	↓
Indicators of adaptation action and process			
		↑	↑
		↓	↓





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Further information at:

www.climateexchange.org.uk

