New Zealand Coastal Hazards and Climate Change Guidance
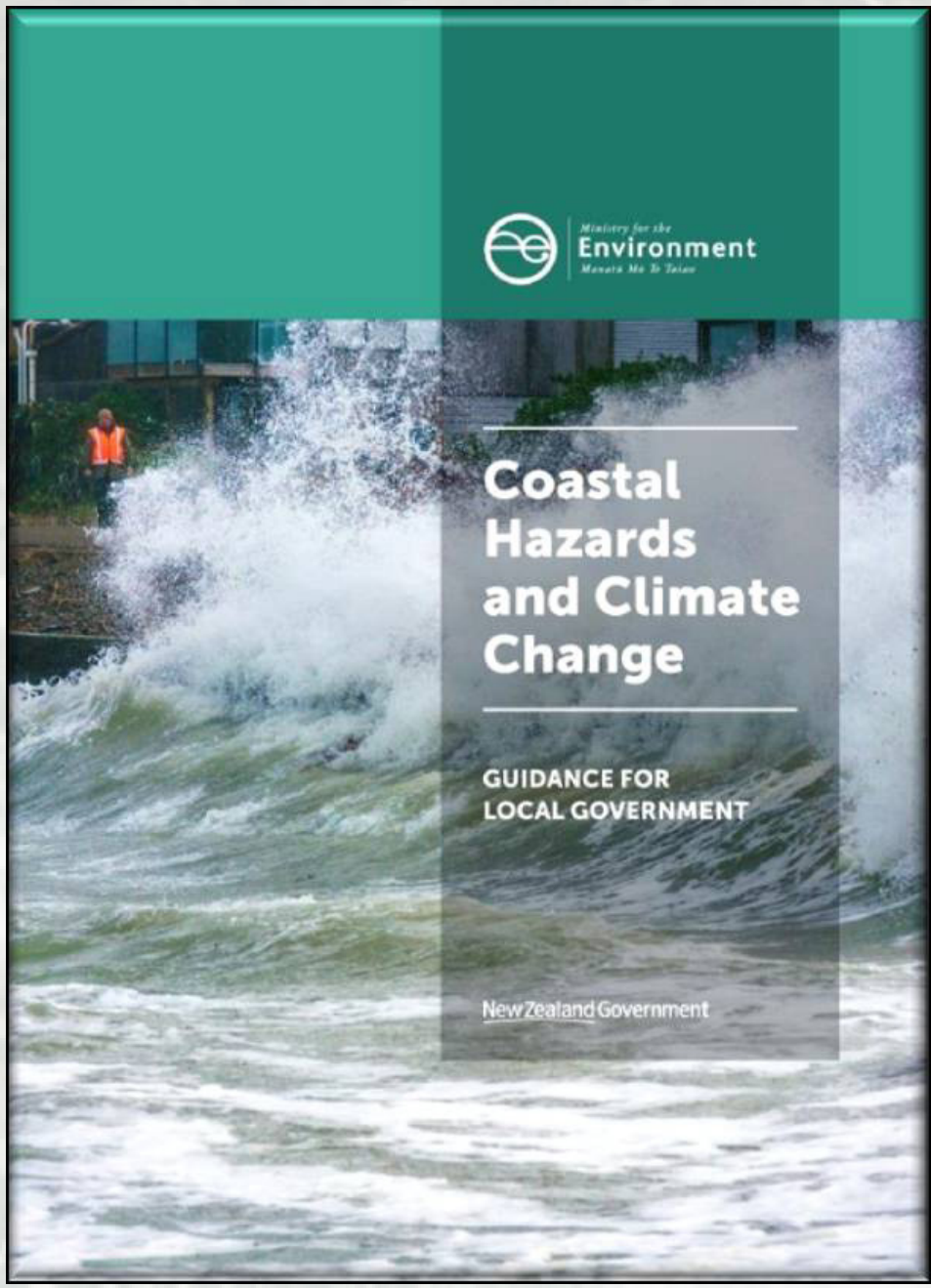
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GUIDANCE

- National coastal guidance (Ministry for the Environment, 2017) on coastal hazards and climate change impacts provides nationally consistent processes and benchmarks for decision makers to address uncertainty and changing risk profiles when exercising statutory functions.

WHO IS THE GUIDANCE FOR?

The Guidance was developed to assist local government to assess, plan, and manage the rising hazard risks facing coastal communities. Adaptation is a devolved responsibility of local government.

- Targeted at multiple local government functions and services for coasts and estuaries as risks increase from sea-level rise or new compound hazards, e.g., from lowland rivers and rising groundwater combined with storm-tide and intense rainfall.
- Functions include planning, asset management, transport planning, civil defence, building control, and river/ coastal engineering.
- For those providing services to local government, communities, iwi, and hapū (as tangata whenua of Aotearoa – New Zealand), e.g., consultants, scientists, engineers, infrastructure providers, surveyors, lawyers, planners, and engagement facilitators.

Storm on Wellington's South Coast, New Zealand. Credit Dave Allen, NIWA.

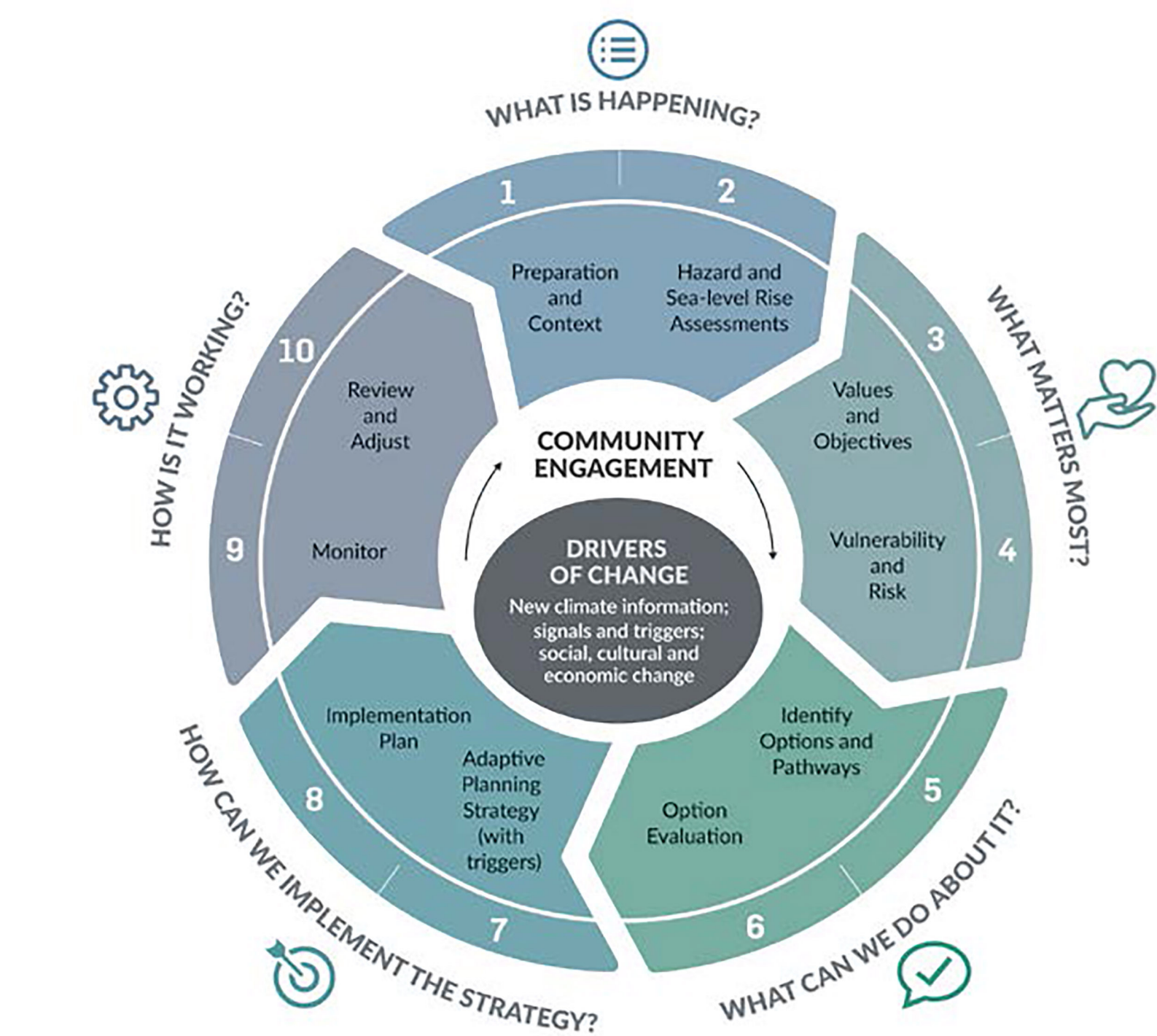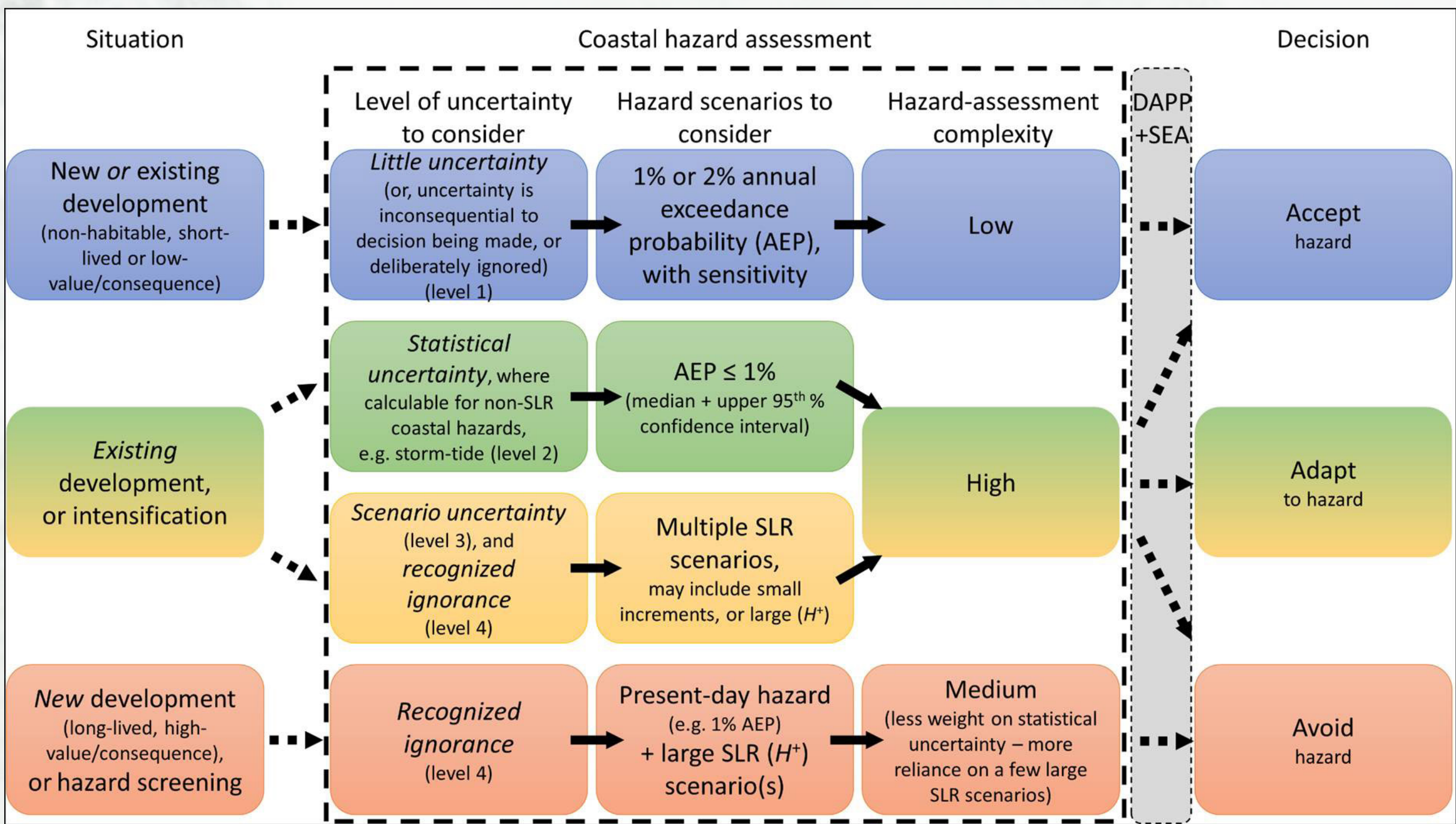## Figure 1. The ten-step decision cycle

Figure 2. Uncertainty framework for coastal hazard assessments

Uncertainty framework for coastal hazard assessments to support DAPP – a logical flow from situation, to level of uncertainty, hazard scenarios to model, likely hazard modelling complexity, and decision type. Dashed arrows and dashed box shows distinction between processes (from the situation to coastal hazard assessment, DAPP, socio-economic assessment (SEA), ultimately to decision type). After Stephens et al. (2017).

What are the elements of the Guidance?

- A ten step decision cycle (Fig 1) grouped around five questions
- Addresses different levels of uncertainty (statistical, scenario, deep uncertainty)
- Uses four sea-level rise scenarios ((NZ RCP2.6M; NZ RCP4.5 M; NZ RCP8.5; NZ RCP 8.5+ =83rd percentile)
- Planning over "at least 100 years" required by New Zealand Coastal Policy Statement 2010
- Matches uncertainty type to hazard and risk (Fig 2)
- Community engagement is central (see engagement principles)
- Dynamic adaptive pathways planning (DAPP) is the underpinning approach (Fig 3)
- Links the legislation to coastal adaptation (Fig 4)
- Monitoring regime, with early signals and triggers (decision points), is central (Fig 3)
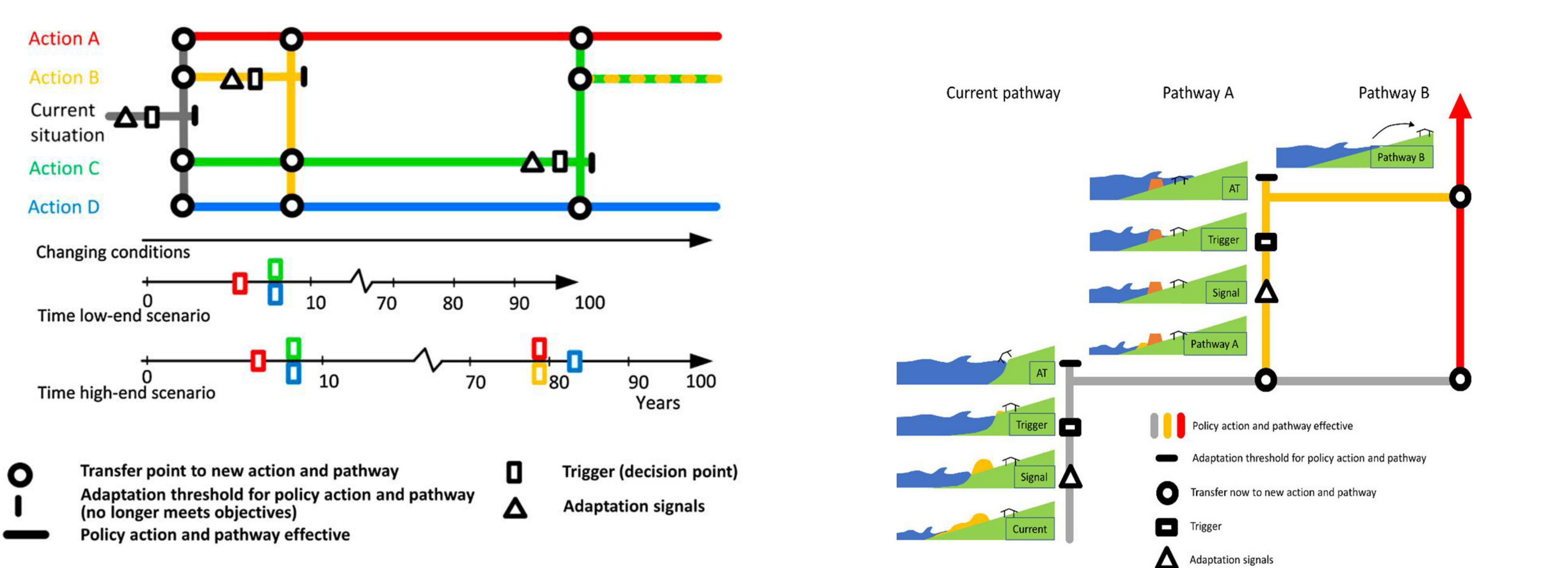
What are the implementation issues?

- Using scenarios instead of single numbers
- Shifting decision maker mind-sets towards long timeframes
- Exemplars needed – especially for managed retreat
- Tailoring engagement processes for the problem scale
- Building trust between councils and communities
- Mainstreaming DAPP – it is a new way of thinking and planning
- Developing robust and long-lasting monitoring systems – who 'owns' the system?
- Who pays for adaptation?
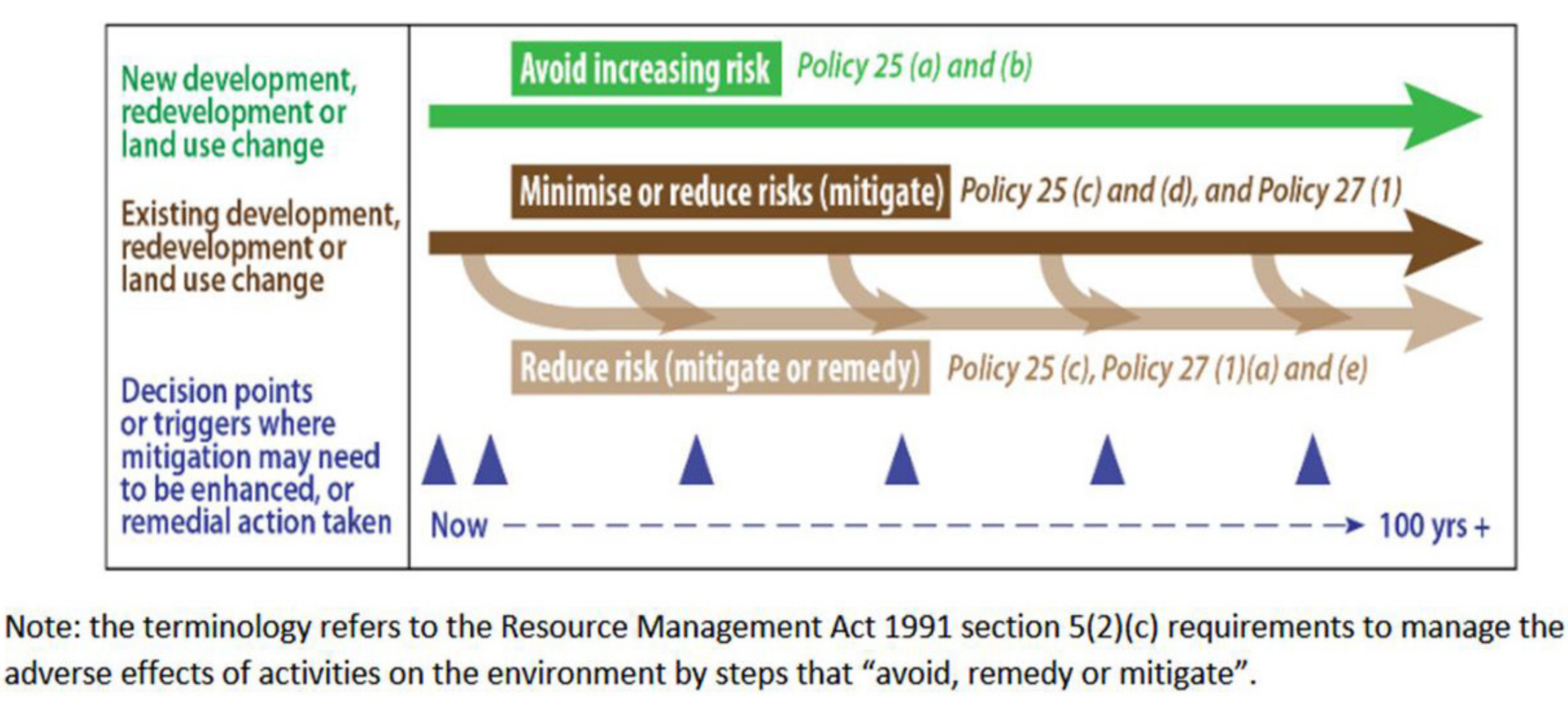
Engagement principles

- Be timely and take the time
- Be flexible and adaptable
- Be inclusive, ensure representative participation (equity)
- Run a transparent process
- Be cognisant of scientific input/knowledge
- Secure committed resources and institutional support

Figure 3. Adaptation pathways maps

After Haasnoot et al. (2013), Hermans et al. (2017)

Example of adaptation pathways maps using DAPP with signals, triggers and thresholds. After: Haasnoot et al. (2013); Hermans et al. (2017) [left]; Stephens et al (2018) [right].

Figure 4. New Zealand coastal policy statement

Broad New Zealand coastal policy statement 2010 decision context for coastal areas exposed to coastal hazards and climate change

Note: the terminology refers to the Resource Management Act 1991 section 5(2)(c) requirements to manage the adverse effects of activities on the environment by steps that "avoid, remedy or mitigate".

References

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