



## Testing Stormwater Treatment Devices

### The Goal:

Establish the performance of stormwater treatment devices.

### The Tasks will provide:

Widely available biophysical and hydrological data.

Understanding of performance, maintenance, acceptance and costs (see Objectives 1 and 4).

Improved design.

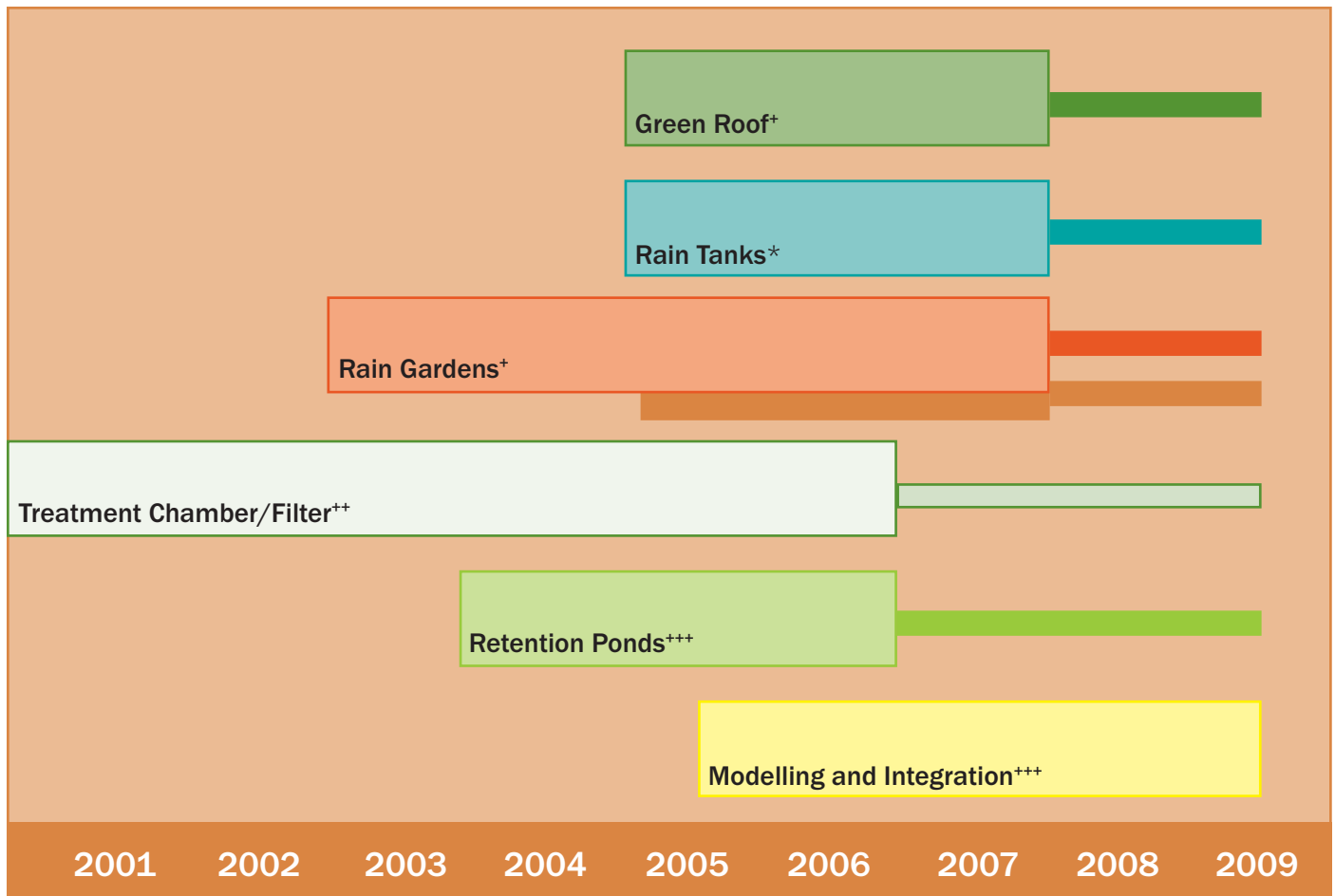
Guidelines and engineering codes based on new design and performance data.

Contribute to Territorial and Local Authority driven programmes to define performance characteristics of stormwater treatment devices

### The Technologies - What, Where, When?

Projects Device	Location	Progress				
		Discussion	Planning	Resource consent	Construction	Performance & Maintenance
Green Roof	New Waitakere Building	[Progress bar]				
Rain Tanks	Talbot Park	[Progress bar]				
	North Shore Tiritiri Rd	[Progress bar]				
	Tamaki Sustainable Building	[Progress bar]				
Rain Gardens	Tamaki Sustainable Building	[Progress bar]				
	Paul Matthews Rd Nth Shore	[Progress bar]				
Permeable Pavers	Te Atatu Peninsula	[Progress bar]				
Riparian Strips		[Progress bar]				
Treatment Chamber (Filters)	River Rd, Wairere Dve Hamilton	[Progress bar]				
	SH1 Cmabridge	[Progress bar]				
	Henderson	[Progress bar]				
	Hewlitts Rd Tauranga	[Progress bar]				
Retention Ponds	Onemana, Waitakere City	[Progress bar]				

## Timeline of Research



**Researcher:** +Robyn Simcock; \*\* Surya Pandey; \*\*\* Sam Trowsdale; \* Alison Greenaway in collaboration with Earl Shaver, ARC and CRC Catchment Hydrology, Melbourne; Waitakere City Council; North Shore City Council, Ngāti Whatua, Environment Waikato, Environment Bay of Plenty, Christchurch City Council; Taupo District Council; Land Transport New Zealand.

## Learnings to Date:

**Green Roofs:** Good overseas data on performance, but limited data on suitable media and plants for NZ conditions. Experience with NZ prototype designs and appropriate plants and growth media provided basis for NZ design.

**Rain Tanks:** Much confusion regarding health issues and social acceptance (Objective 1) to be resolved.

**Rain Gardens:** Experience with retrofitting, design and construction and introducing re-engineered soil. (e.g. Tamaki Building) and monitoring data. New design information for TP10.

**Grass Swales:** ARC data and our data emphasise soil quality, design and planting for stormwater flow and water retention.

**Treatment Chamber/Filters:** ARC and our data defining optimum media and maintenance regime for treatment walls in chambers. Organic material (e.g. compost, peat, wood ash, spaghnum) will remove heavy metals and PAH's.

**Retention Ponds:** Removal of heavy metals, particularly zinc, suspended sediments and nutrients better understood.

## Future Learnings:

**Green Roof:** Performance (quality and quantity) of optimised NZ prototypes.

**Rain Tanks:** Clarification of health and technical issues, addressing community concerns (Objective 1).

**Rain Gardens:** Performance data on NZ designs around Auckland and Tauranga.

**Grass Swales:** Performance when soils are properly re-engineered.

**Permeable Pavers:** Performance data and selection support of media and cost effectiveness

**Riparian Strips:**

**Treatment Chambers/Filters:** Define best combination of materials with and without sand plus maintenance and L.C.A (with Objective 4).

**Retention Ponds:** Establish through monitoring design features and the components of the ponds that best contribute to contaminant removal and cost-effectiveness (with Objective 4).

## Modelling performance of individual devices

Effectiveness of systems in terms of water quality and water quantity; the treatment train approach - how best to utilise together; synthesising overseas data and NZ data; economic, social and LCA aspects of adopting these systems (with Objective 1 and 4).

## Other Actions:

Ensure that learnings are targeted for maximum value, e.g. cost and effectiveness information provide for asset management plans.

## Who are we working with?

FRST; Auckland Regional Council; Auckland City Council; Waitakere City Council; North Shore City Council, Ngāti Whatua, Environment Waikato, Environment Bay of Plenty, Christchurch City Council; Taupo District Council; Land Transport New Zealand; Co-operative Research Centre (Aus); Engineers; Planners; Practitioners; Developers.