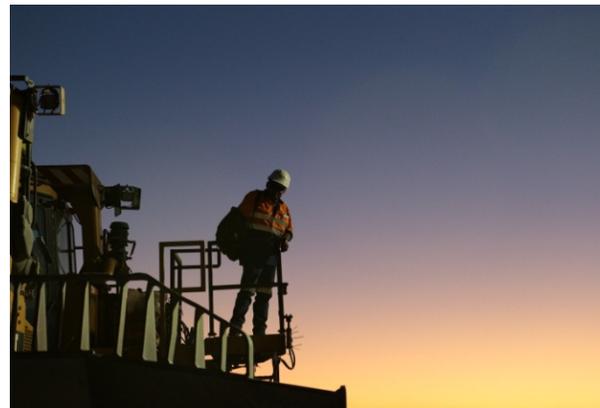


Losing our Grip?

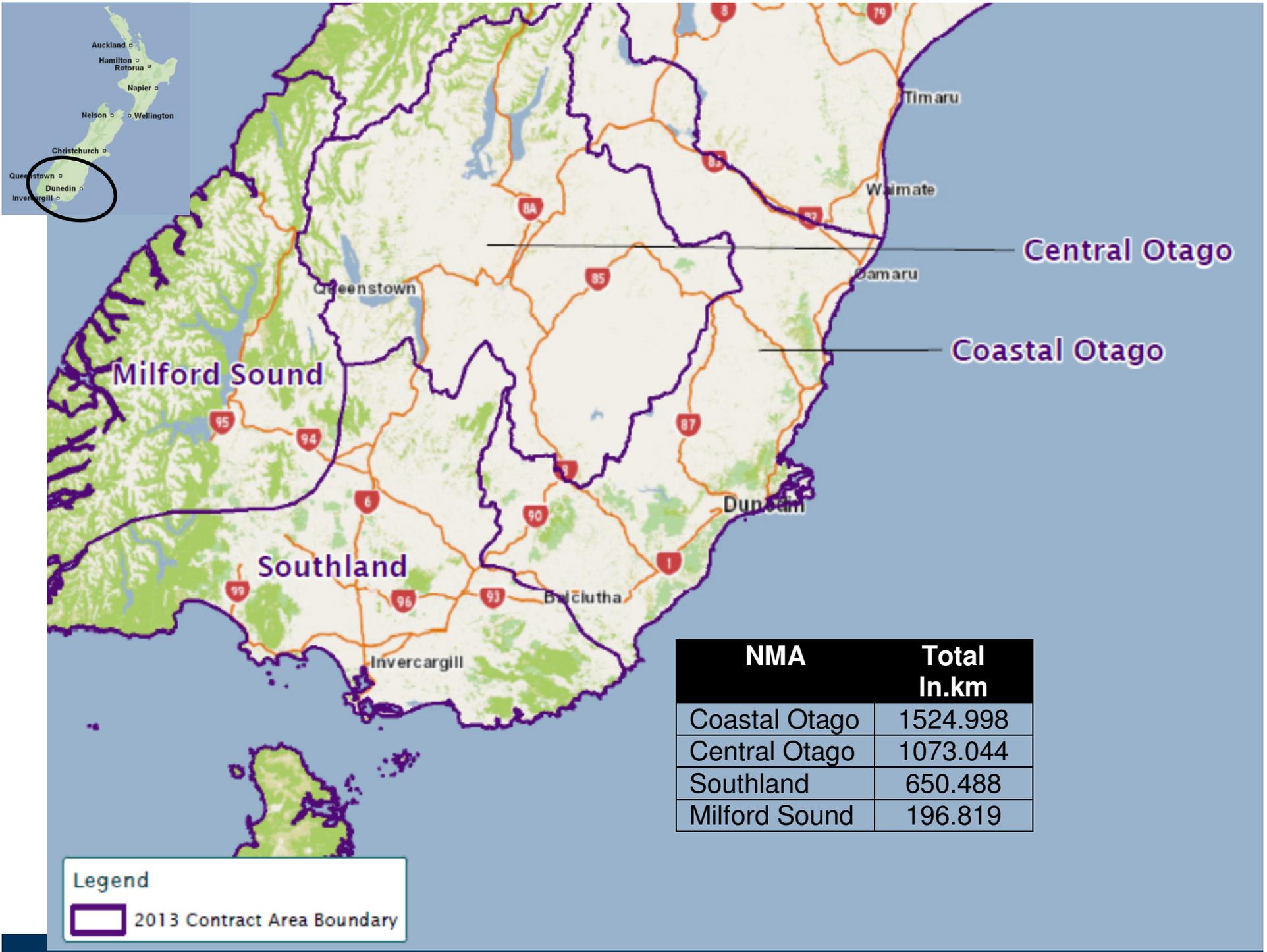
The challenge of maintaining safer road surfaces
on southern New Zealand State Highways

Peter Mortimer
Paul Stewart



- 
1. Treatment Methodology
 2. Aggregate Performance
 3. Aggregate Shape

SH8 Lindis Pass 971m ASL

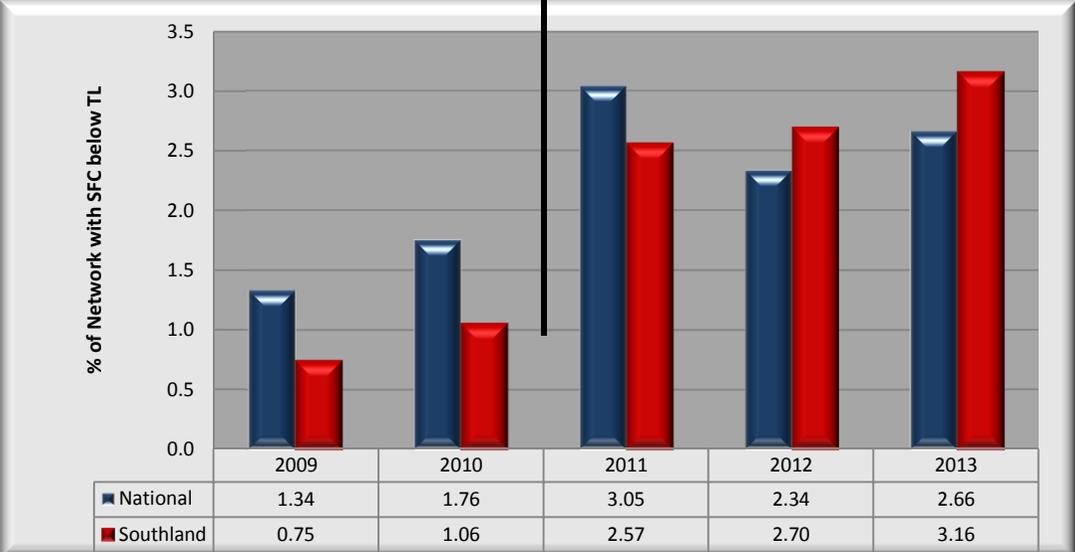
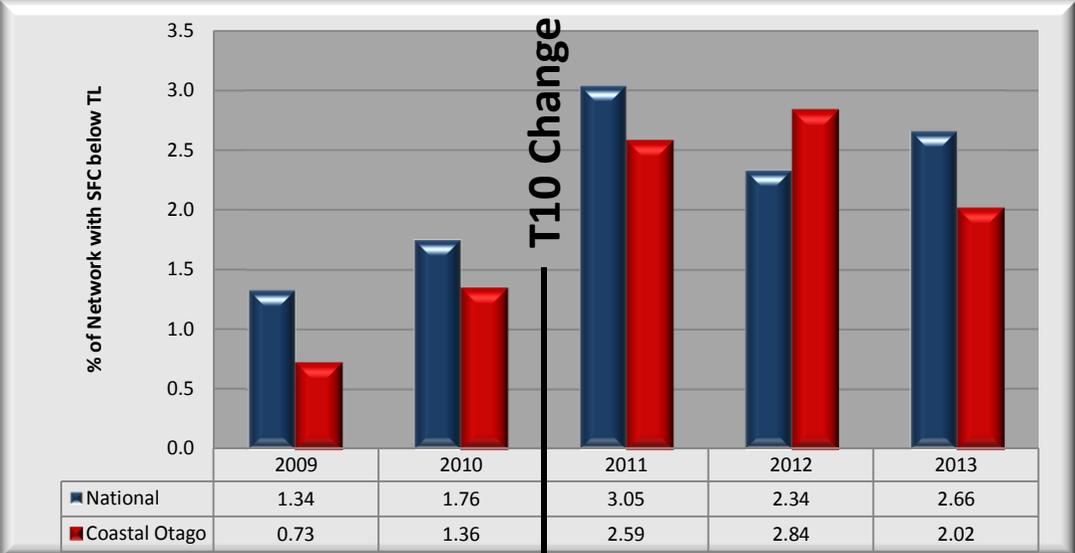


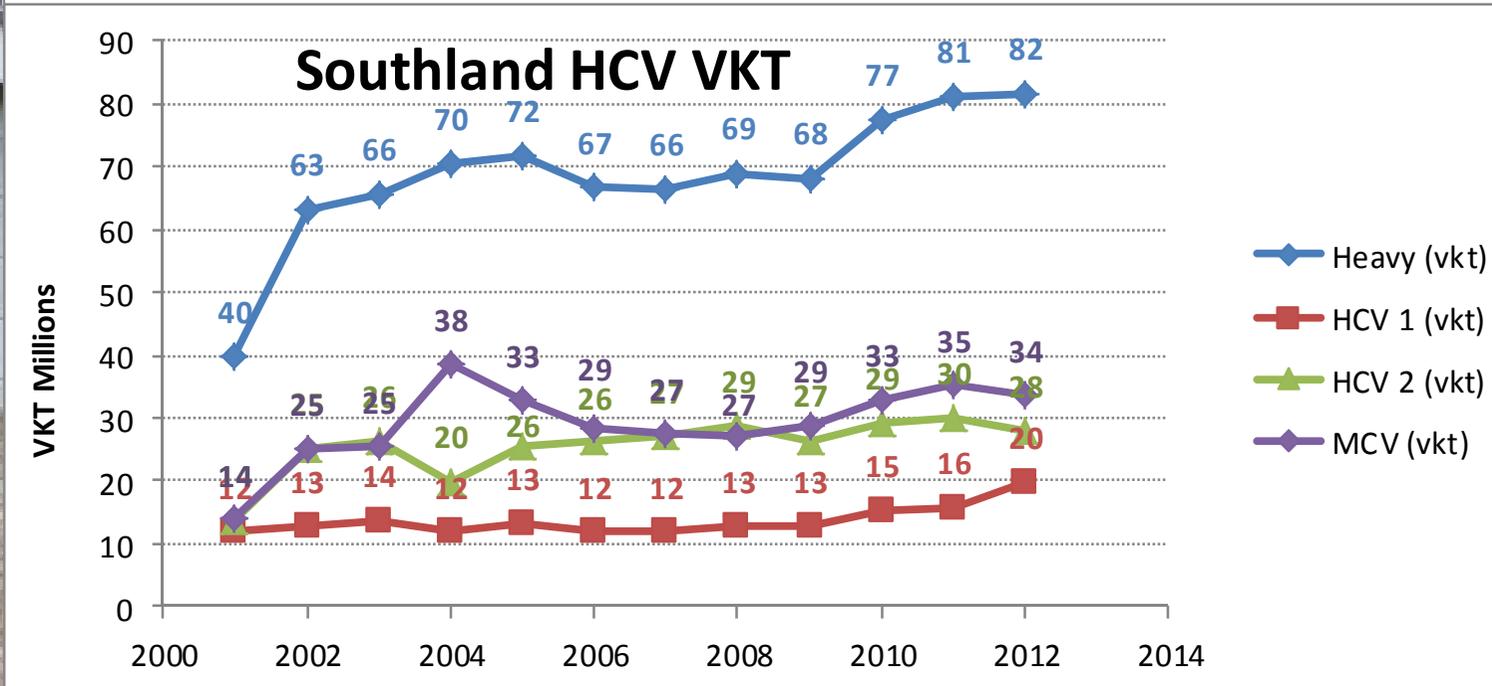
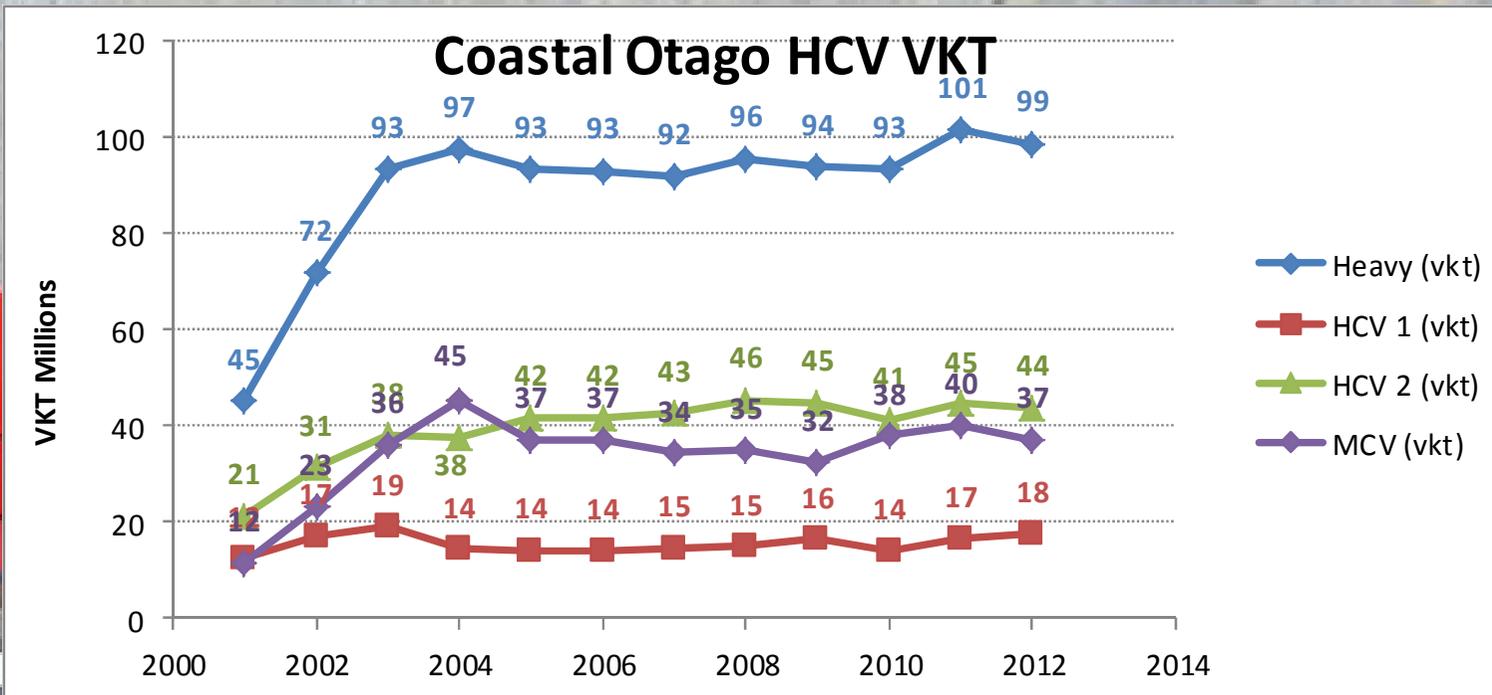
Legend

 2013 Contract Area Boundary

Site category	Skid site description	Investigatory level (IL), units ESC					
		0.35	0.40	0.45	0.50	0.55	0.60
1	Approaches to: a) Railway level crossings b) Traffic signals c) Pedestrian crossings d) Stop and Give Way controlled intersections (where state highway traffic is required to stop or give way) e) Roundabouts. One lane bridges: a) Approaches and bridge deck.						
2	a) Urban curves <250m radius						
	b) Rural curves <250m radius			L	M	H	
	c) Rural curves 250-400m radius		L	L	M	H	
	a) Down gradients >10%. b) On ramps with ramp metering.						
3	a) State highway approach to a local road junction. b) Down gradients 5-10% c) Motorway junction area including on/off Ramps d) Roundabouts, circular section only.						
4	Undivided carriageways (event-free).						
5	Divided carriageways (event-free).						

Historic Performance



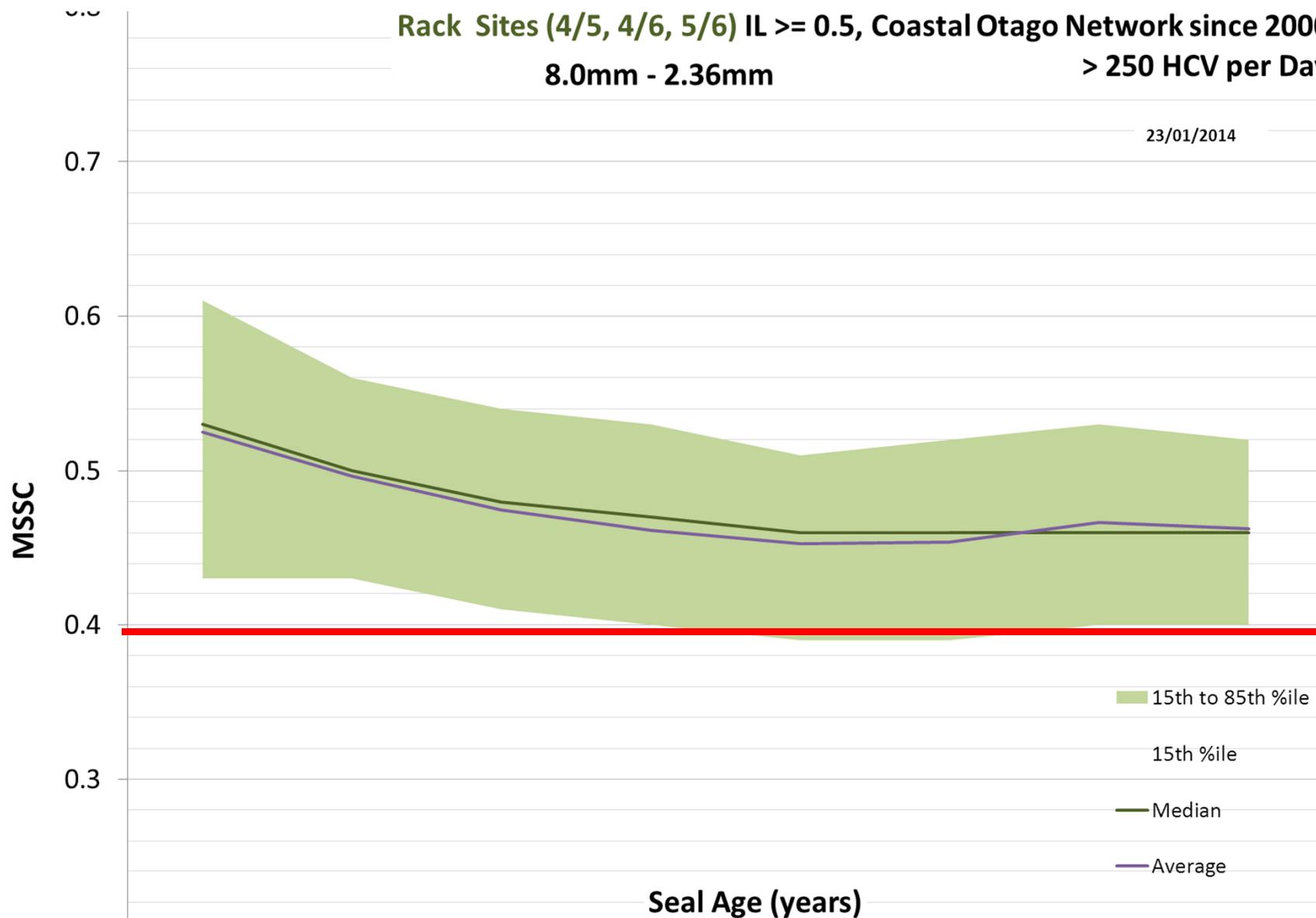


Treatment methodology



Rack Sites (4/5, 4/6, 5/6) IL \geq 0.5, Coastal Otago Network since 2000
8.0mm - 2.36mm **> 250 HCV per Day**

23/01/2014

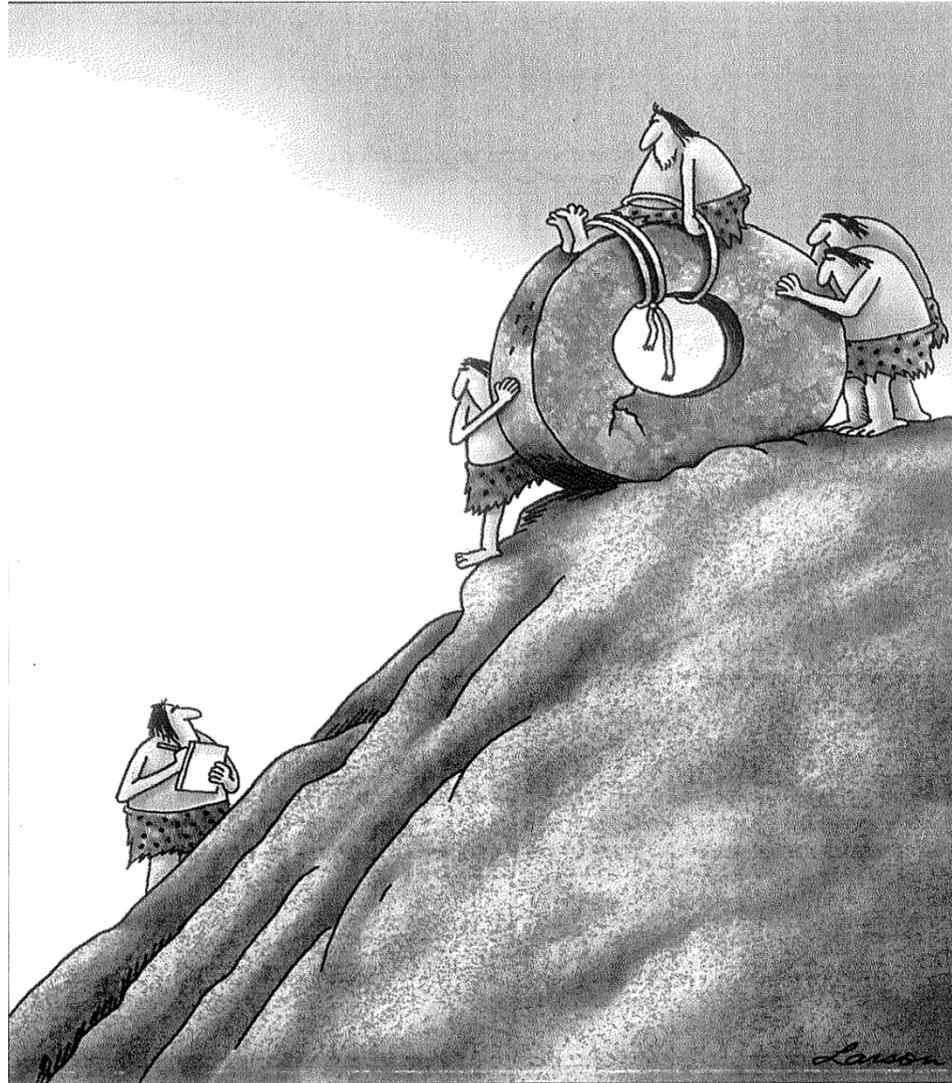


15th to 85th %ile
 15th %ile
 Median
 Average

Seal Age (years)

	0	1	2	3	4	5	6	7
15th to 85th %ile	0.18	0.13	0.13	0.13	0.12	0.13	0.13	0.12
15th %ile	0.43	0.43	0.41	0.4	0.39	0.39	0.4	0.4
Median	0.53	0.5	0.48	0.47	0.46	0.46	0.46	0.46
count	4414	6382	5926	5900	5656	4844	3732	1202
Average	0.52	0.50	0.47	0.46	0.45	0.45	0.47	0.46

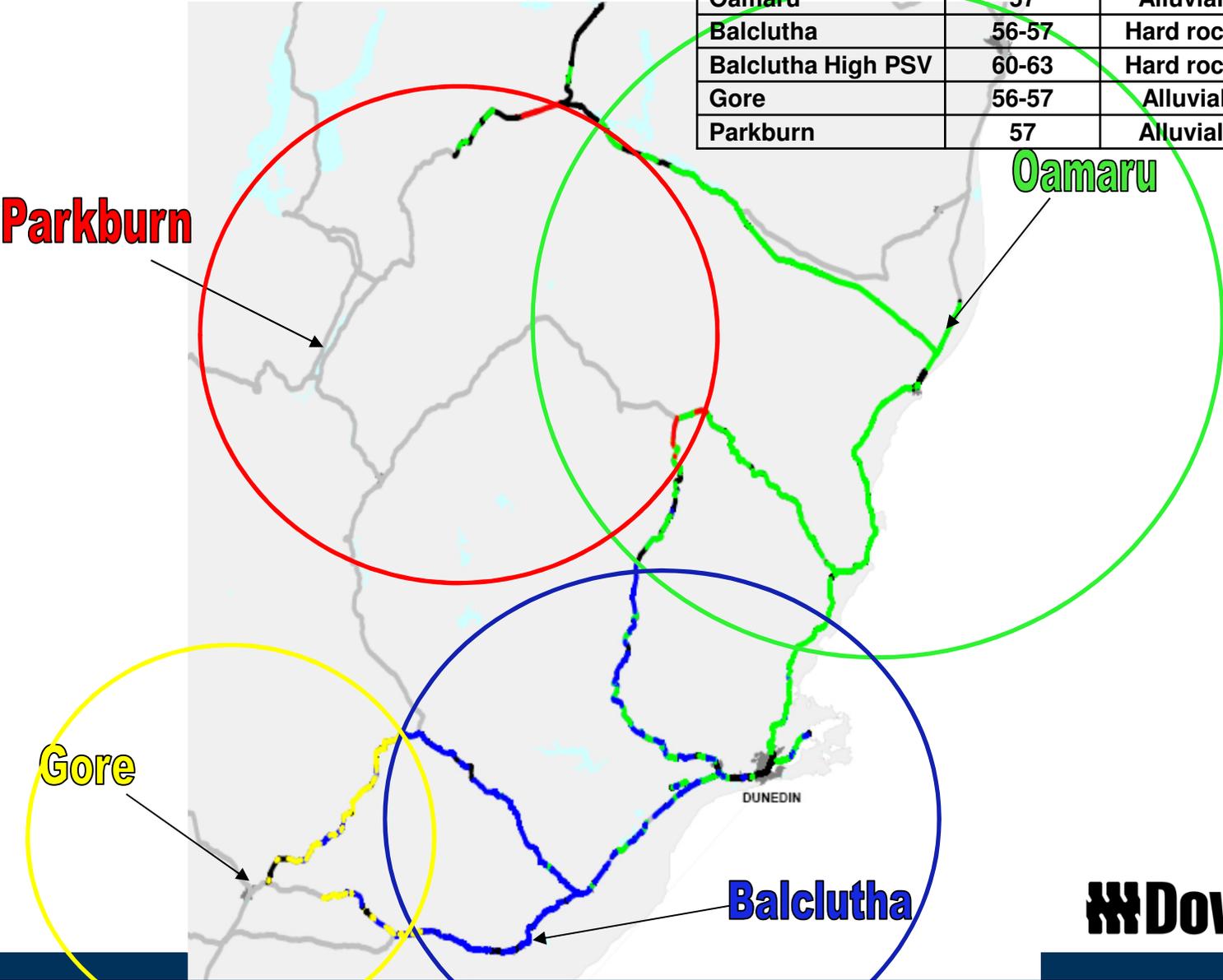
Aggregate Performance



Early experiments in transportation

Historic Chip Sources

Source	PSV	Description
Oamaru	57	Alluvial, Greywacke
Balclutha	56-57	Hard rock, Greywacke
Balclutha High PSV	60-63	Hard rock, Greywacke
Gore	56-57	Alluvial Greywacke
Parkburn	57	Alluvial, Greywacke



Analysis



Parkburn vs Balclutha - Cat 2 Sections, Entire Network
Reseal sites since July 2000
> 250 HCV per Day

MSSC

0.8
0.7
0.6
0.5
0.4
0.3
0.2

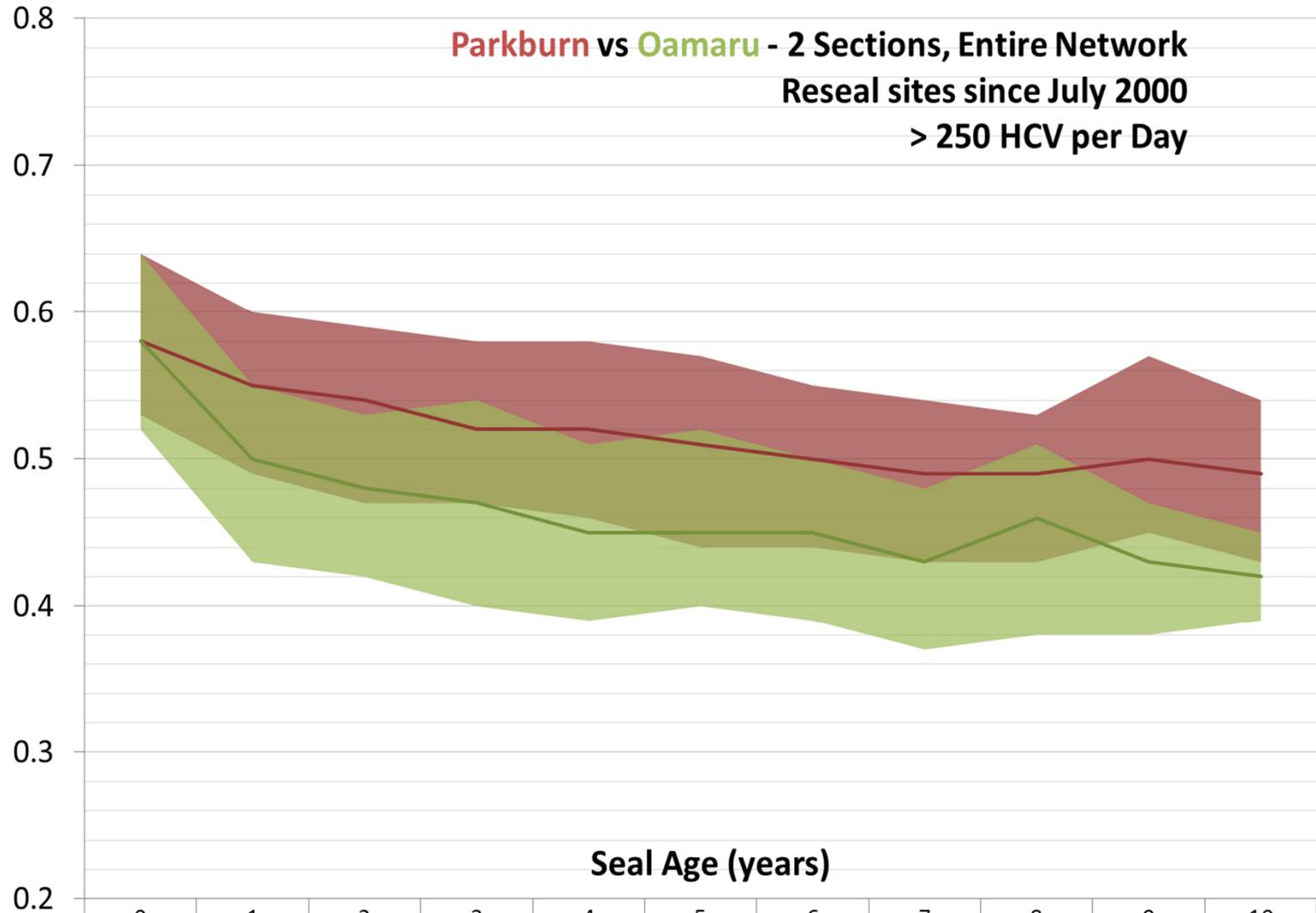
Seal Age (years)

0 1 2 3 4 5 6 7 8 9 10

Parkburn 15th to 85th %ile	0.11	0.11	0.12	0.11	0.12	0.13	0.11	0.11	0.1	0.12	0.11
Parkburn 15th	0.53	0.49	0.47	0.47	0.46	0.44	0.44	0.43	0.43	0.45	0.43
Balclutha 15th to 85th %ile	0.11	0.12	0.12	0.12	0.12	0.1	0.11	0.11	0.1	0.09	0.0875
Balclutha 15th	0.49	0.44	0.43	0.42	0.4	0.41	0.39	0.39	0.39	0.38	0.38
Parkburn Median	0.58	0.55	0.54	0.52	0.52	0.51	0.5	0.49	0.49	0.5	0.49
Balclutha Count	876	4082	3364	2932	2264	1308	1204	692	584	478	116
Parkburn Count	5946	7918	7178	6460	5316	4776	3860	2888	2276	630	144
Balclutha Median	0.54	0.5	0.5	0.48	0.46	0.47	0.44	0.45	0.45	0.42	0.425

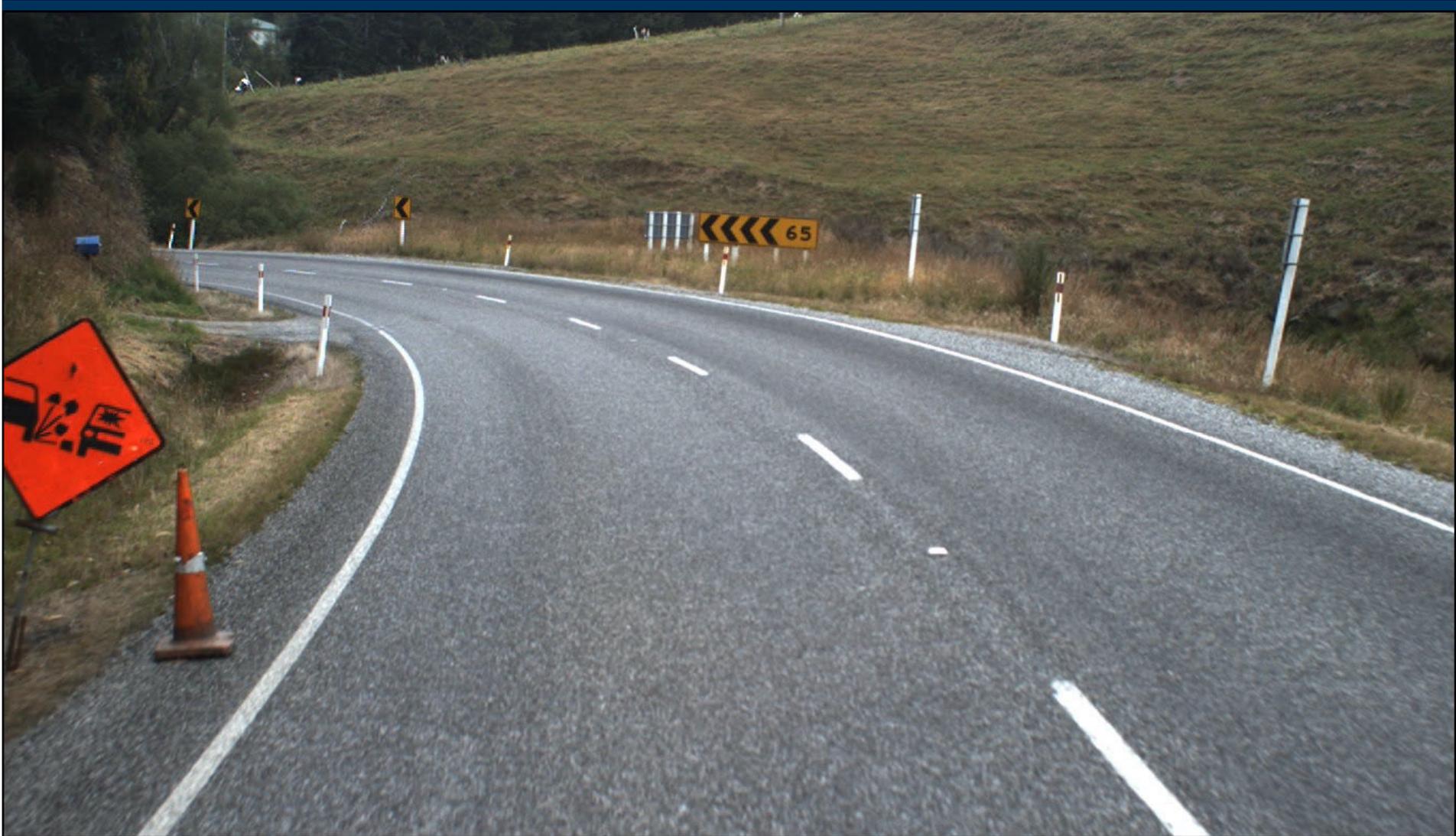
Parkburn vs Oamaru - 2 Sections, Entire Network
Reseal sites since July 2000
> 250 HCV per Day

MSSC



Seal Age (years)

	0	1	2	3	4	5	6	7	8	9	10
Parkburn 15th to 85th %ile	0.11	0.11	0.12	0.11	0.12	0.13	0.11	0.11	0.1	0.12	0.11
Parkburn 15th	0.53	0.49	0.47	0.47	0.46	0.44	0.44	0.43	0.43	0.45	0.43
Oamaru 15th to 85th %ile	0.12	0.12	0.11	0.14	0.12	0.12	0.11	0.11	0.13	0.09	0.06
Oamaru 15th	0.52	0.43	0.42	0.4	0.39	0.4	0.39	0.37	0.38	0.38	0.39
Parkburn Median	0.58	0.55	0.54	0.52	0.52	0.51	0.5	0.49	0.49	0.5	0.49
Oamaru Count	1916	4401	3300	2548	2110	1176	588	536	370	226	226
Parkburn Count	5946	7918	7178	6460	5316	4776	3860	2888	2276	630	144
Oamaru Median	0.58	0.5	0.48	0.47	0.45	0.45	0.45	0.43	0.46	0.43	0.42



Linear: 008-0444/02.58-I Spatial (NZMG): 2263156 E, 5456436 N

Surveyed: 07-Feb-2013

**Post Parkburn Chip IL ≥ 0.5 , Coastal Otago Network 11/12 and 12/13
Parkburn sites
> 250 HCV per Day, Excluding Flushed Sites**

23/01/2014

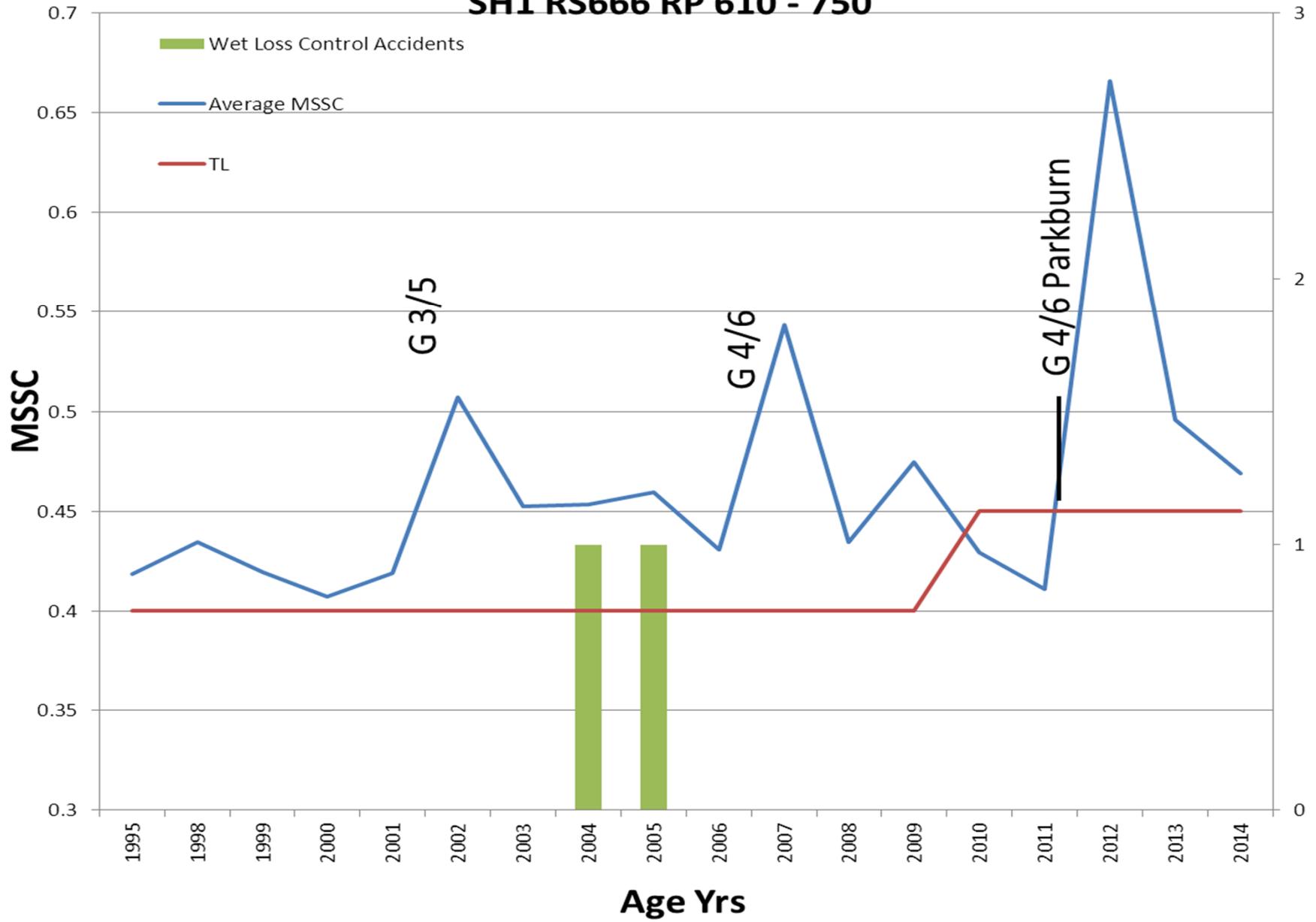
MSSC

0.80
0.70
0.60
0.50
0.40
0.30
0.20

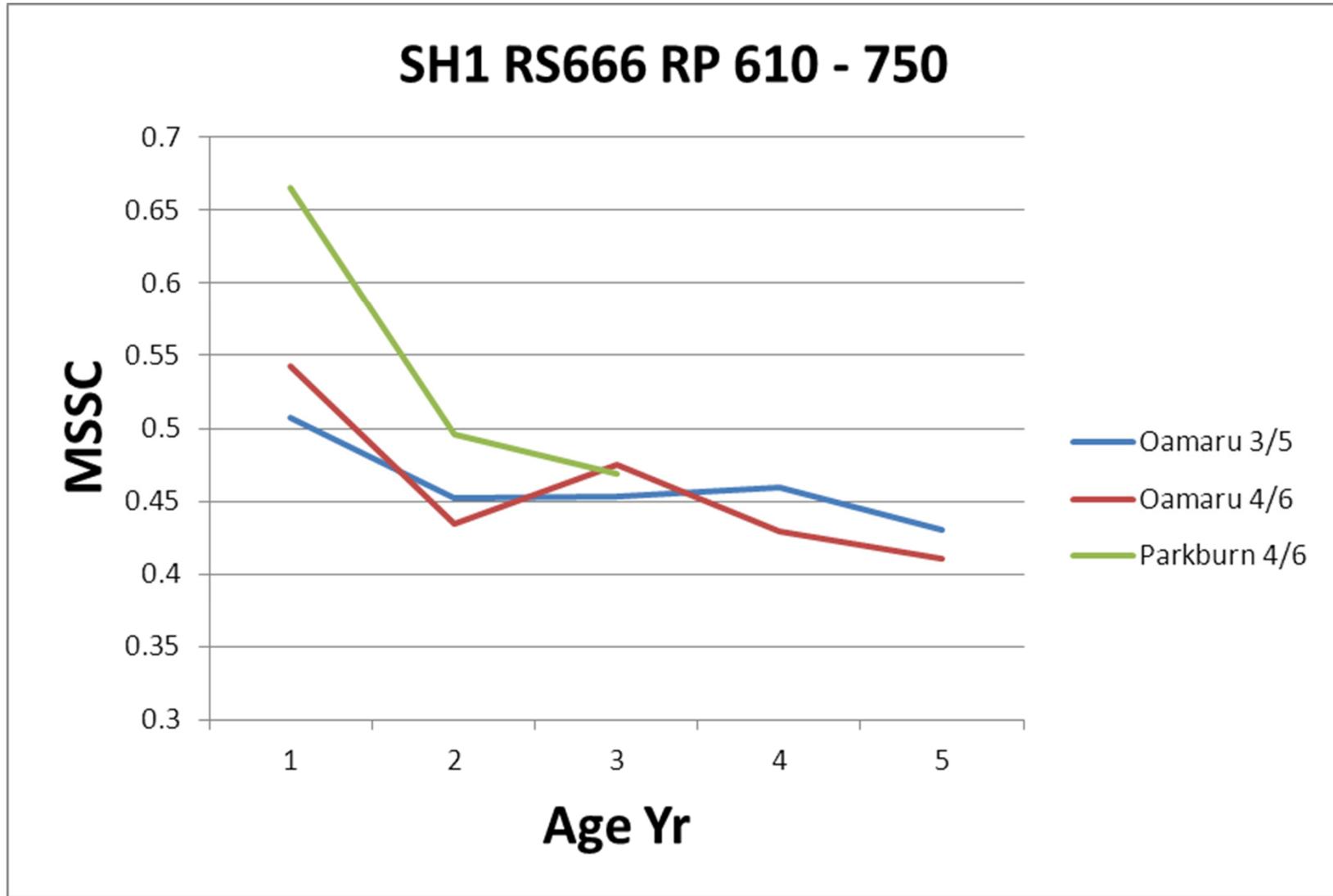
Seal Age (years)

	Pre 0	Pre 1
15th to 85th %ile	0.10	0.11
15th %ile	0.49	0.44
Median	0.54	0.50
Count	410	307

SH1 RS666 RP 610 - 750

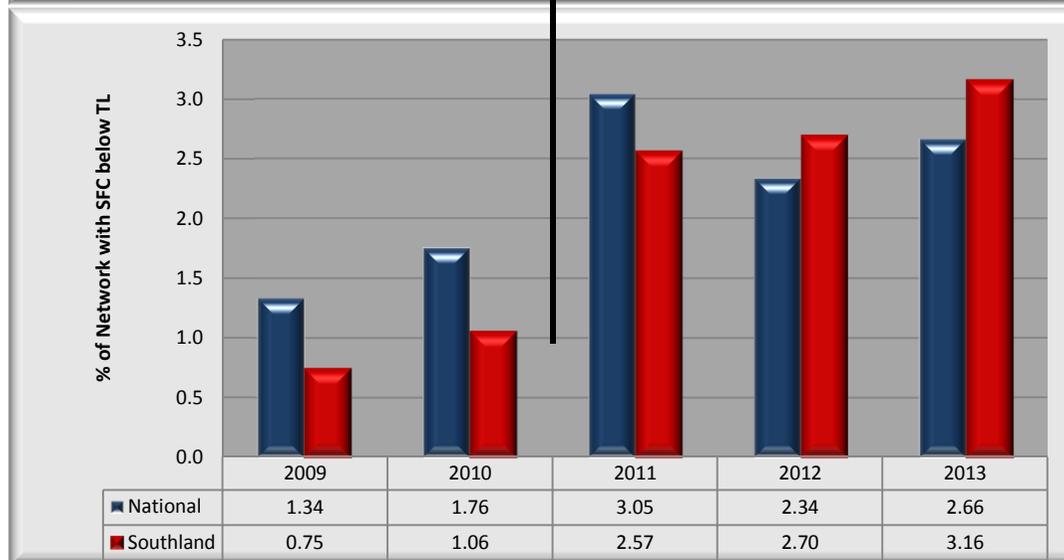
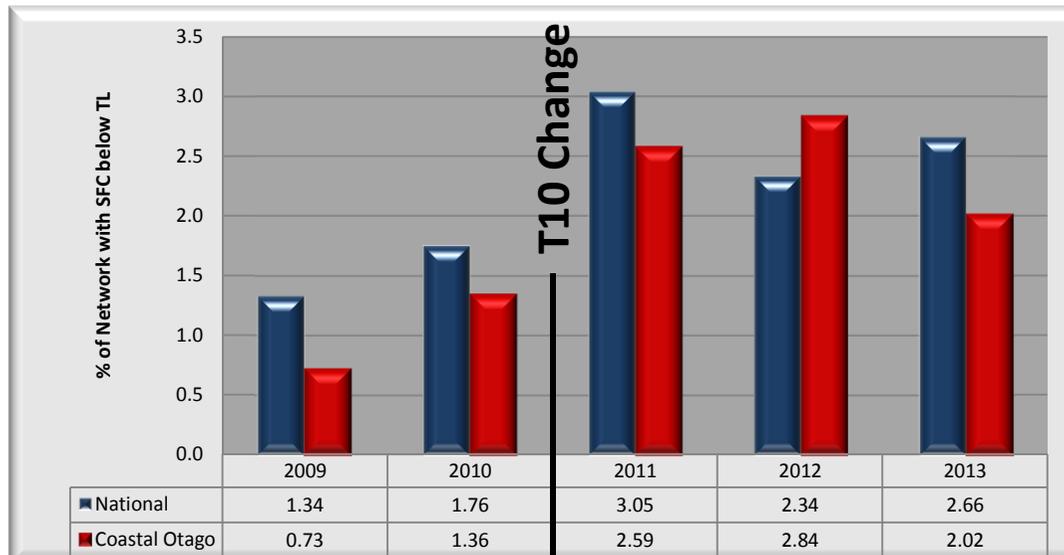


SH1 RS666 RP 610 - 750

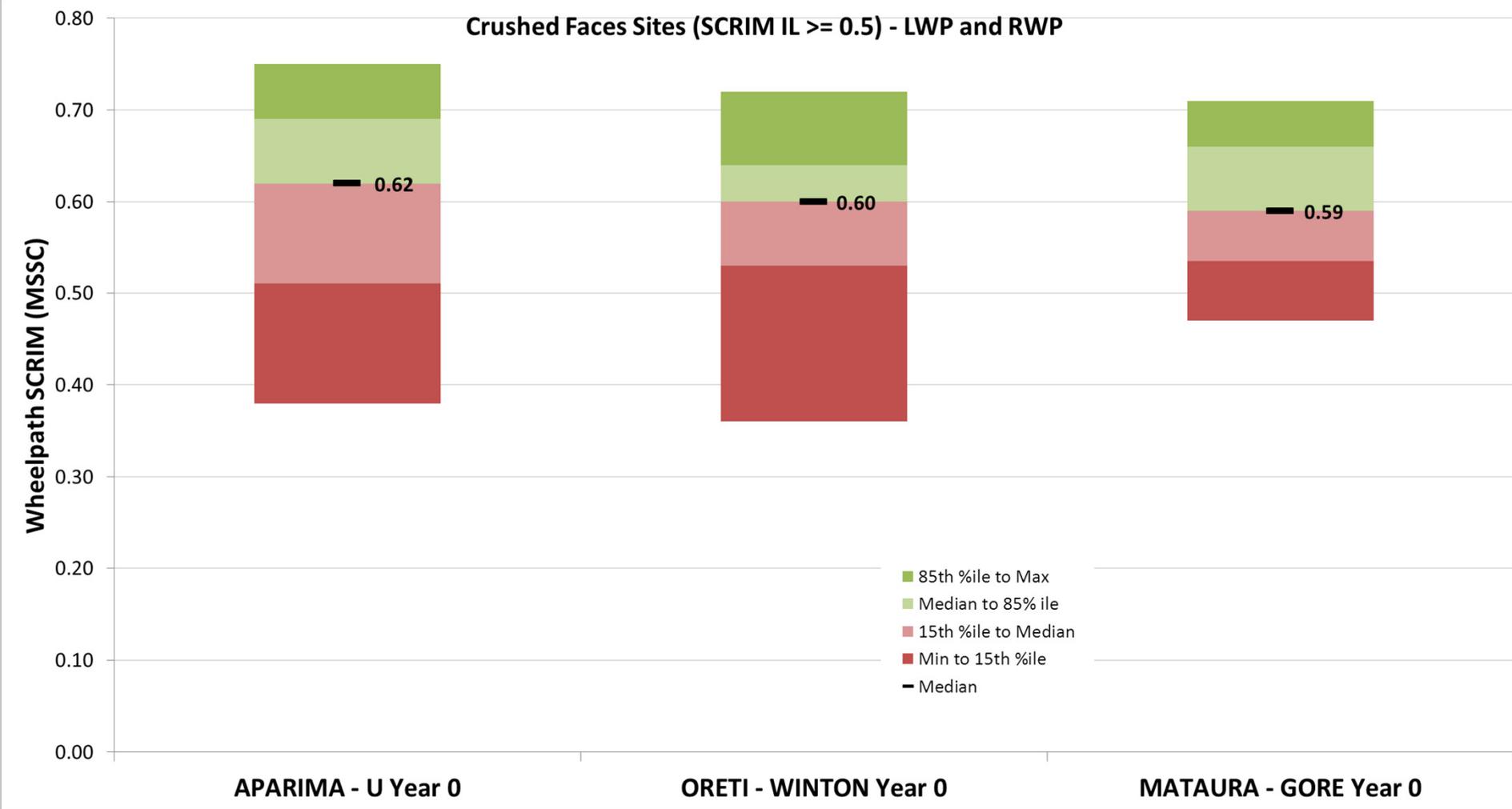


Aggregate Crushed Faces

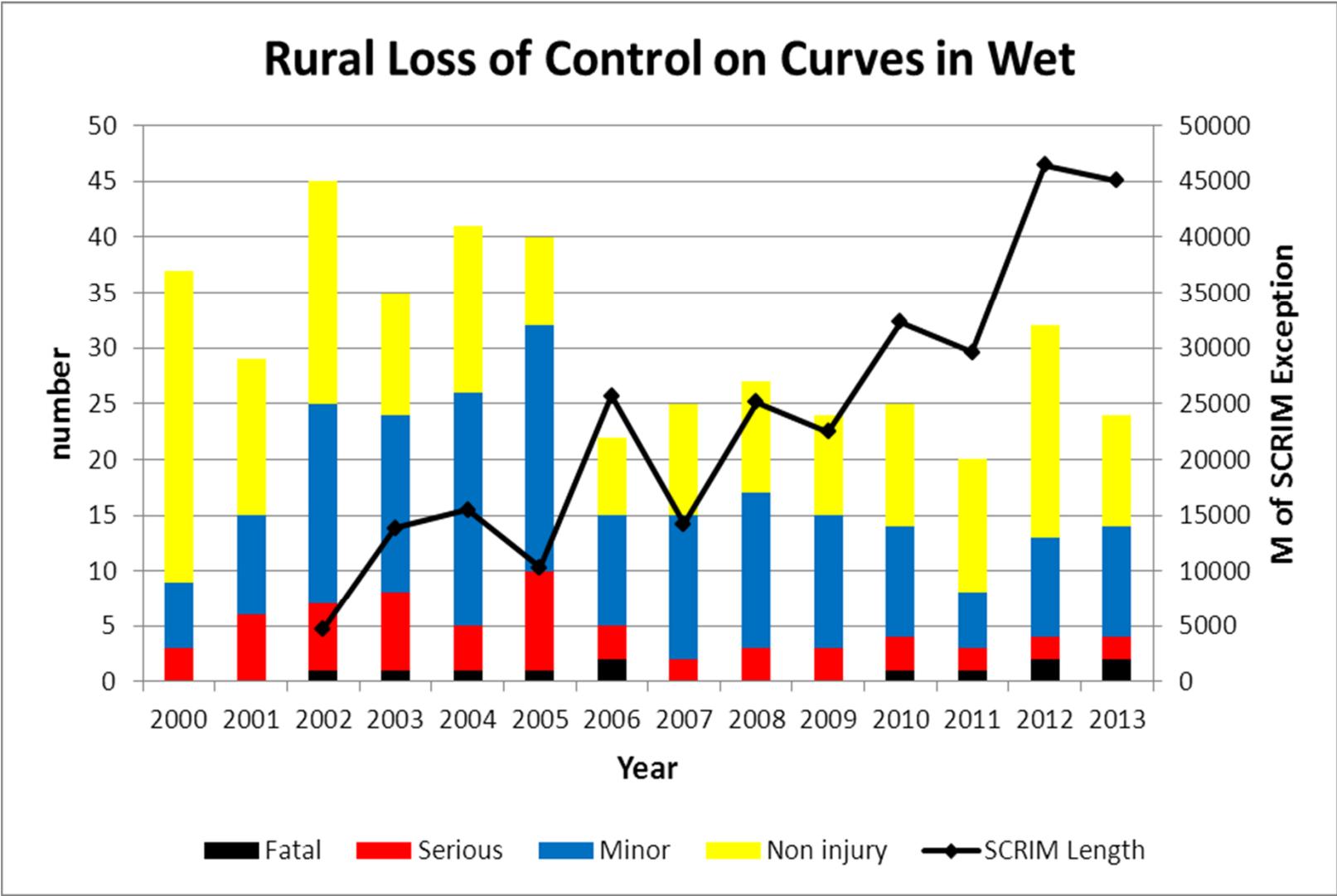




First Year results



Effect on crashes





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