



Western Washington University
Western CEDAR

Salish Sea Ecosystem Conference

2018 Salish Sea Ecosystem Conference
(Seattle, Wash.)

Apr 6th, 8:45 AM - 9:00 AM

The WRIA 9 marine shoreline monitoring and compliance project phase 2

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(Watershed Resource Inventory Area)

WRIA 9 Marine Shoreline Monitoring and Compliance Project Phase 2

Kollin Higgins

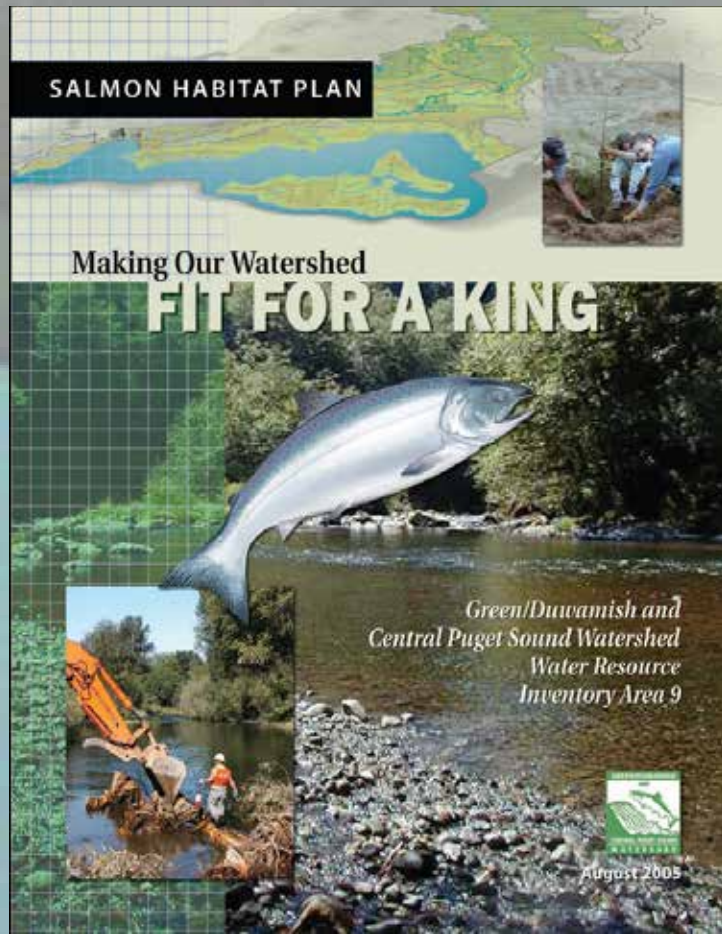
King County Department of Natural Resources and Parks

April 6th 2018

"This project received funding from the EPA under an agreement with WDFW. The contents do not necessarily reflect the views and policies of the EPA. Mention of trade names or commercial products does not reflect endorsement".

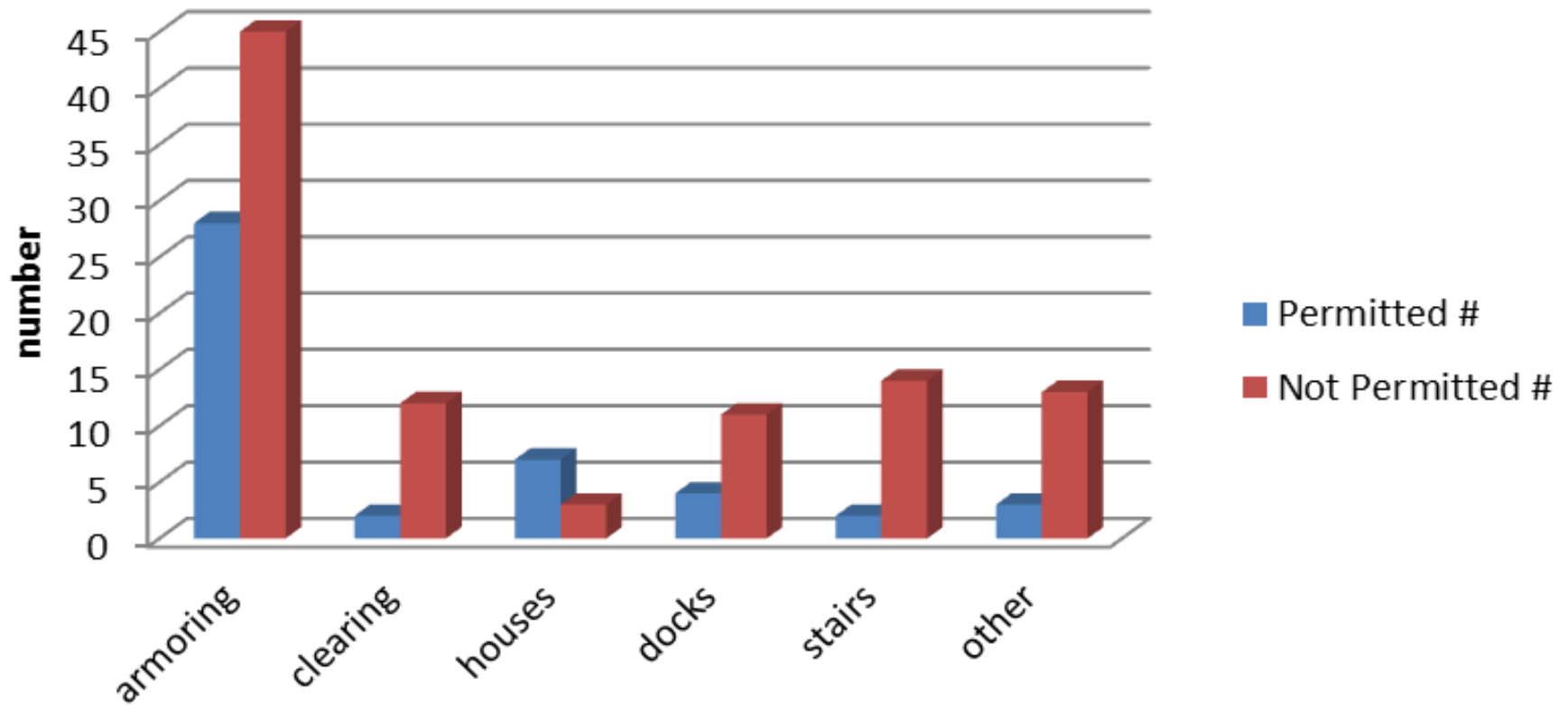
Why do this Project?

- WRIA 9 Salmon Plan calls for:
 - No new shoreline armoring
 - Monitoring of shoreline condition
 - “Improve enforcement of existing land use and other regulations”
- WRIA 9—2010 Status and Trends monitoring report called for boat based surveys vs. aerial photo analysis
- 2012-2013 Pilot project found
 - Several instances of new armor that offset previous 10 years of restoration
 - Many repairs to existing armor
 - Low compliance (no permits)



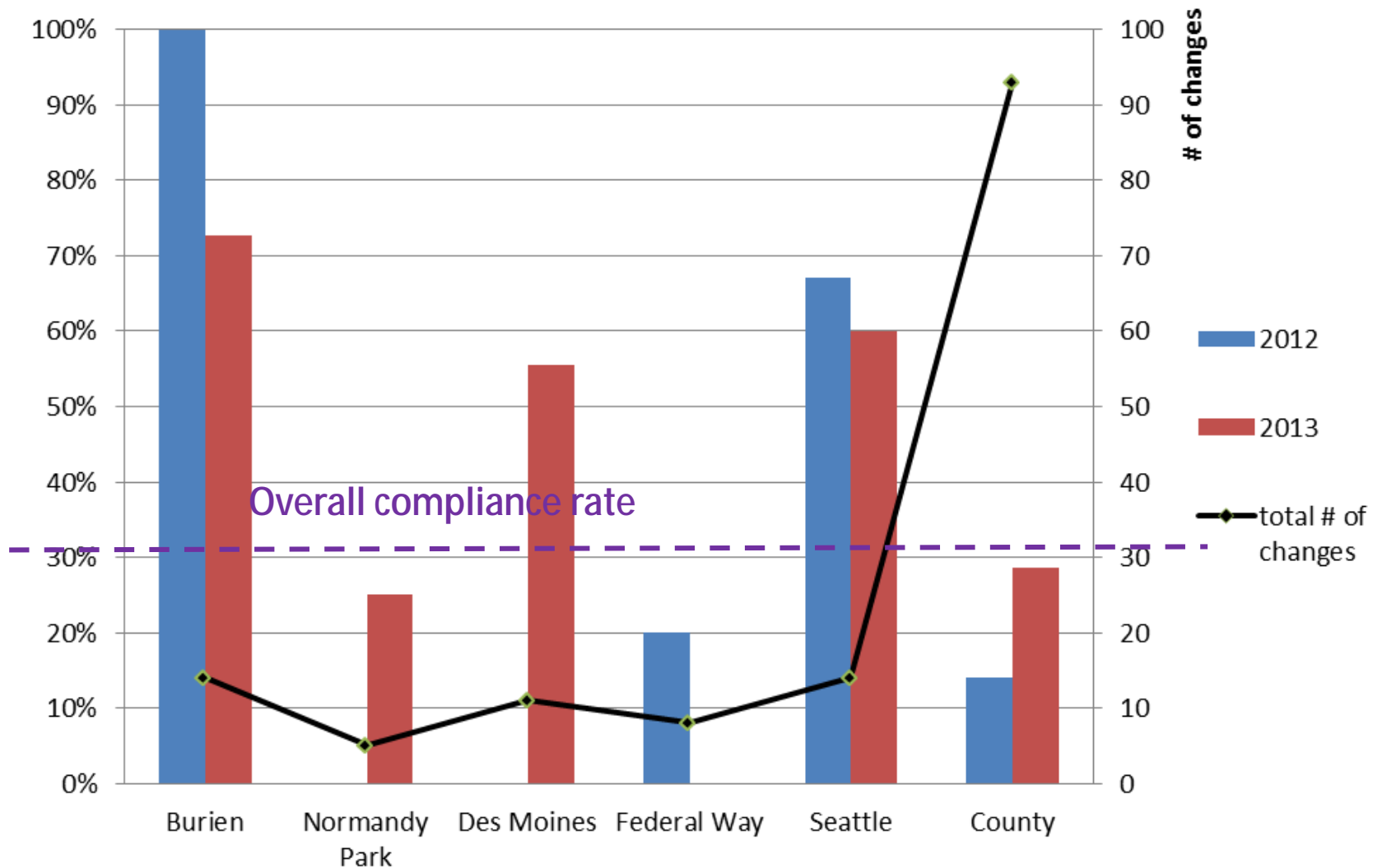
Pilot Project Results

Compliance by type of change



Pilot Project Results, continued

Compliance by jurisdiction



Why do Phase 2?

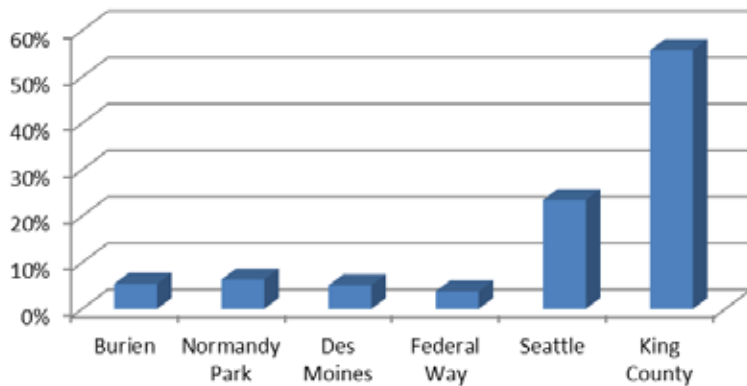
- Has the amount of shoreline armor \uparrow or \downarrow
- Pilot project-outreach occurred, especially on Vashon
 - 5 articles in local paper-Vashon Beachcomber
 - Several presentations to community groups
 - Very little outreach on Mainland portions of WRIA 9
 - Anecdotally, some undertaking efforts to hide changes
- Any changes in behavior/compliance rate?



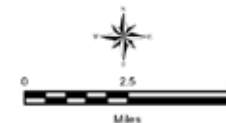
Project Area

- 92 miles
 - 52 miles rural (48% armored)
 - 40 miles urban (83% armored)

% of WRIA 9 shoreline



WRIA 9 Marine Shoreline Monitoring and Compliance Project





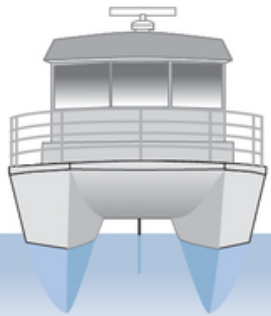
RESEARCH

King County

New research vessel for King County

SoundGuardian research catamaran

▪ Cost: \$1.98 million



A-frame
▪ 2,500-pound capacity

Marine crane
▪ 2,200-pound capacity

Laboratory
▪ Portable sediment table
▪ Hydewire metering
▪ Vacuum pump and tank

Length: 48 ft.
Beam: 18.8 ft.
Draft: 3 ft.

Fuel capacity: 650 gallons
Fresh water capacity: 100 gallons
Passengers: 4 crew, 20 scientists

GPS capable camera



I-Pad mini with
ARC Collector



Benefits of the bigger boat

- Was able to bring city and state staff on boat
- Day One-7 city staff, 3 state/other staff
- Day Two-2 State, 2 County, 1 City staff
- Great for conversations—less need for explanation later. City staff can see changes first hand
- Ecology Shorelines staff able to see their shoreline areas *with* that jurisdiction's staff
- There were comforts-heating, microwave, bathroom, etc.

2016 data

- 600 photos
- Initially identified 139 changes in shoreline conditions since 2013 survey
- After undertaking in-office change verification process (Qa/Qc) total changes at 147





Example of bulkhead replacement

Note height difference



~3 to 5 feet

12.07.2016

Example of clearing/tree topping



12.07.2016

Example of clearing/tree topping, stairs, retaining wall

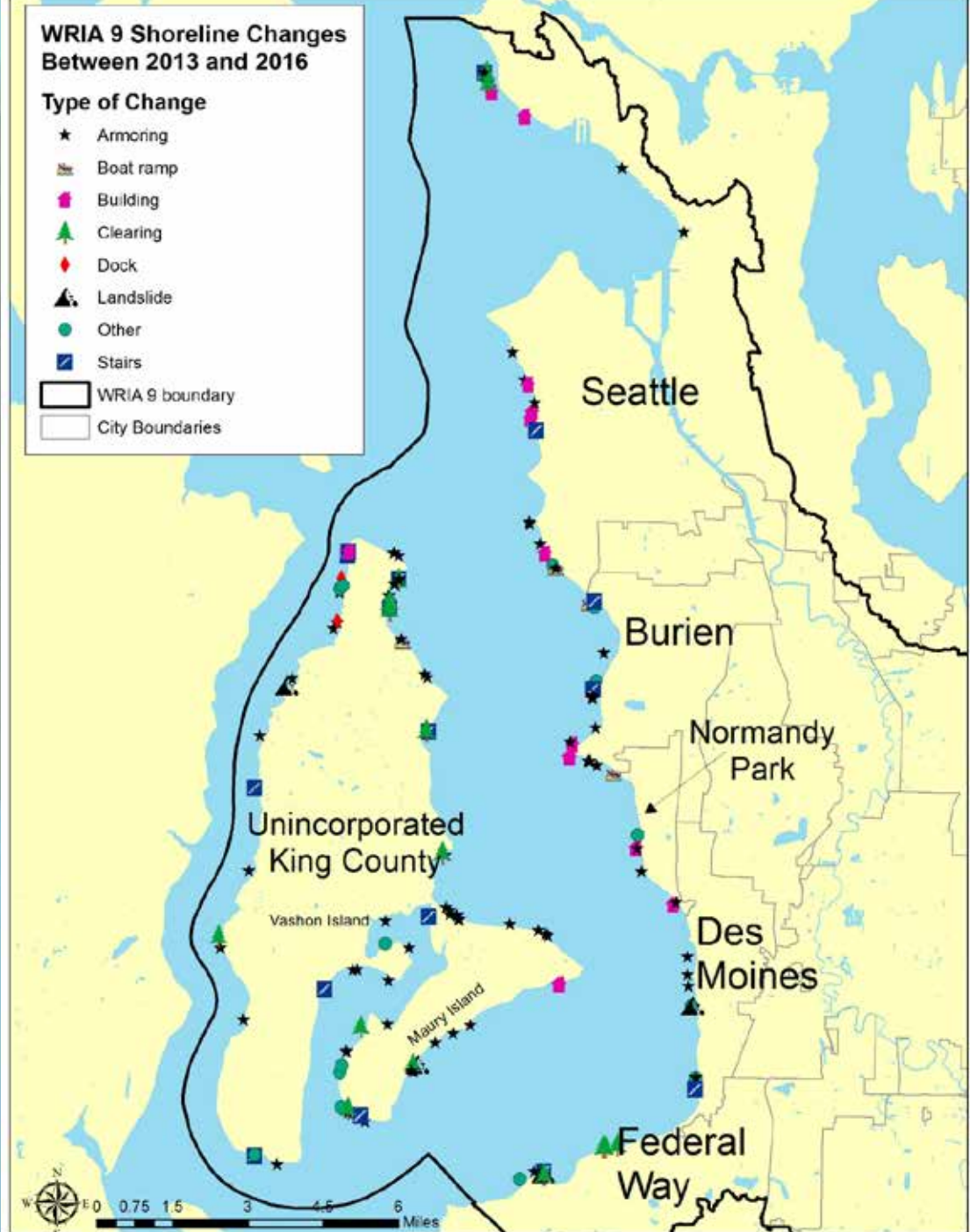


12.06.2016

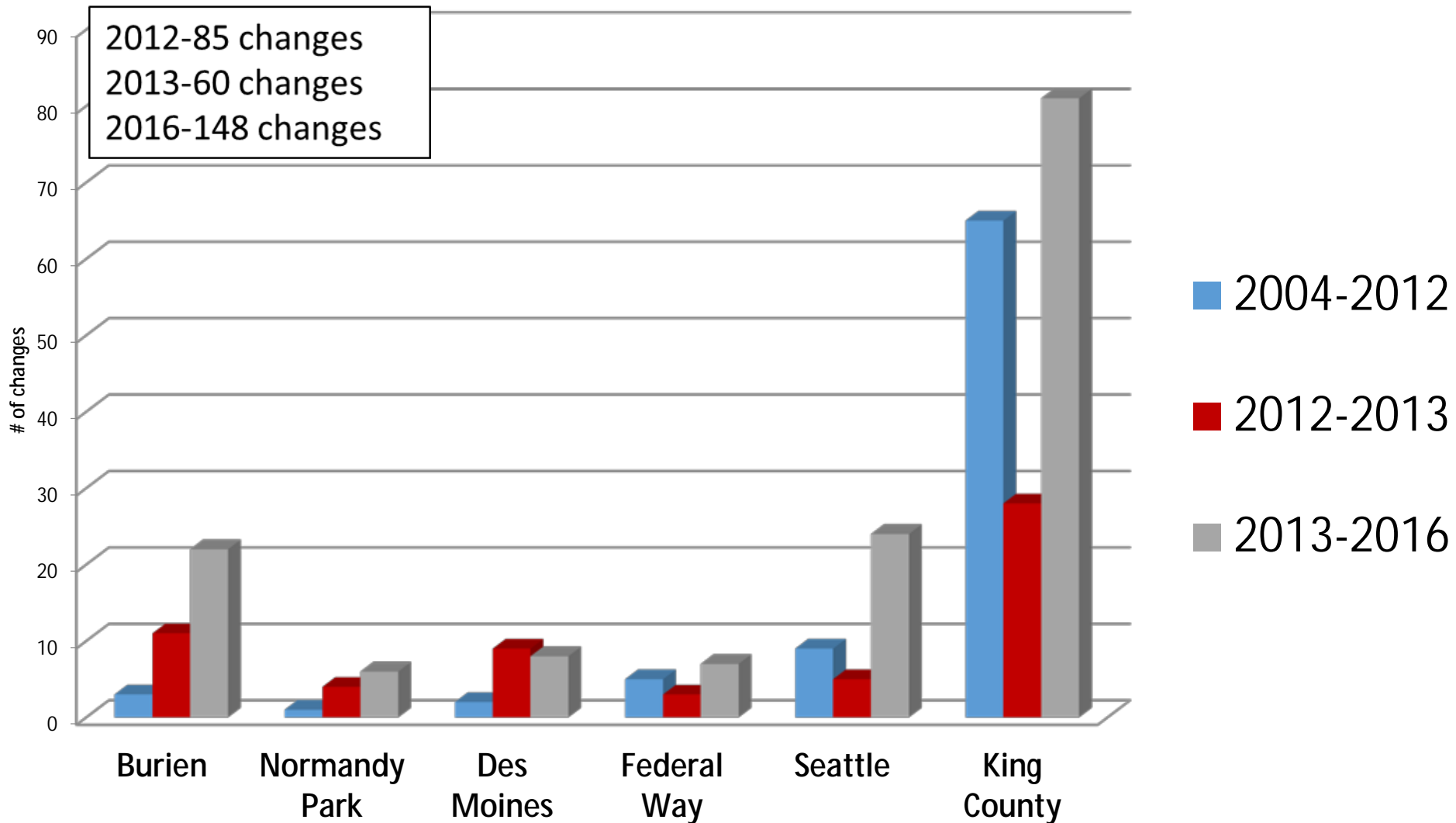
WRIA 9 Shoreline Changes Between 2013 and 2016

Type of Change

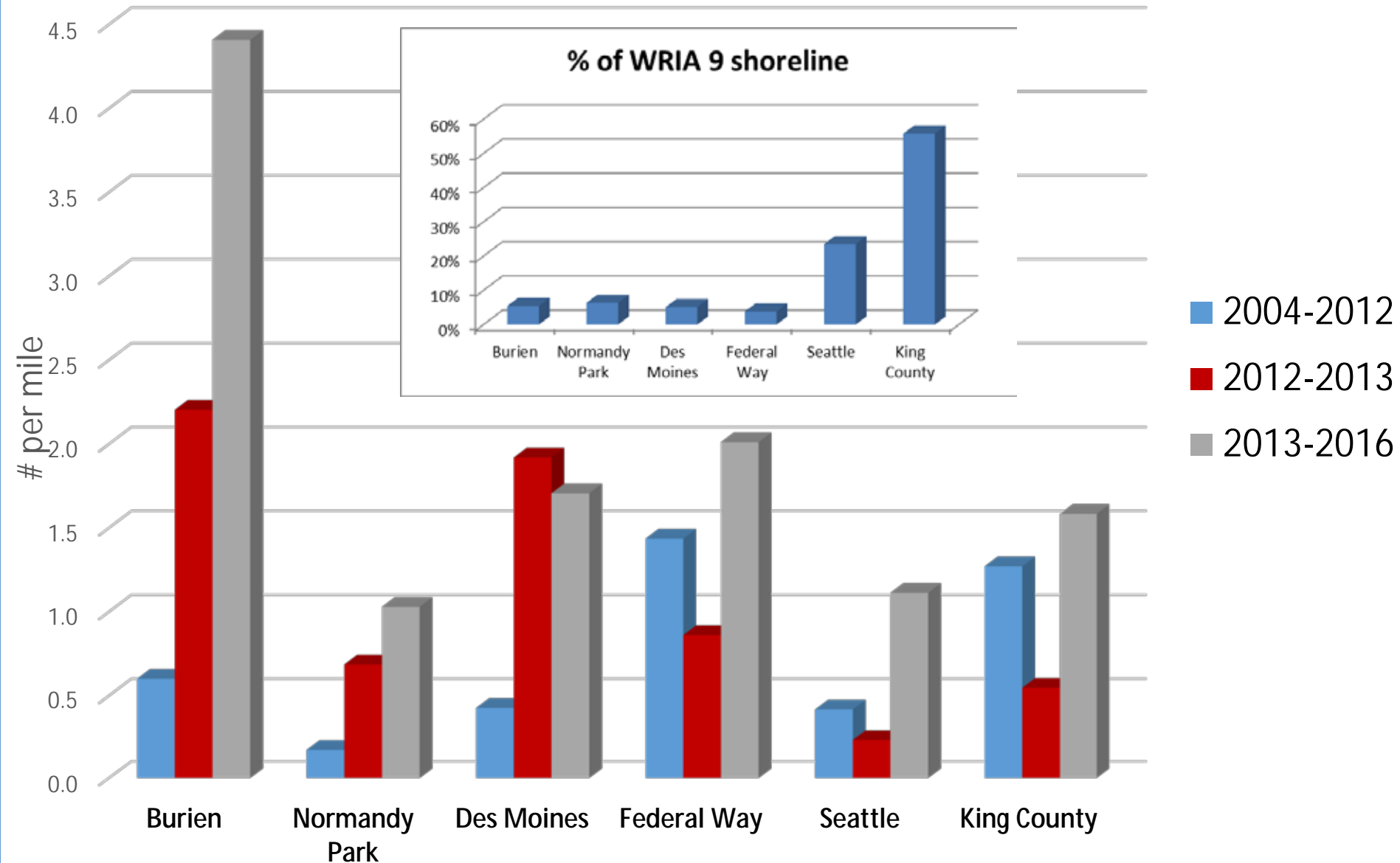
- ★ Armoring
- 🚤 Boat ramp
- 🏗️ Building
- 🌲 Clearing
- 🚢 Dock
- ⚠️ Landslide
- Other
- 🏠 Stairs
- ▭ WRIA 9 boundary
- ▭ City Boundaries



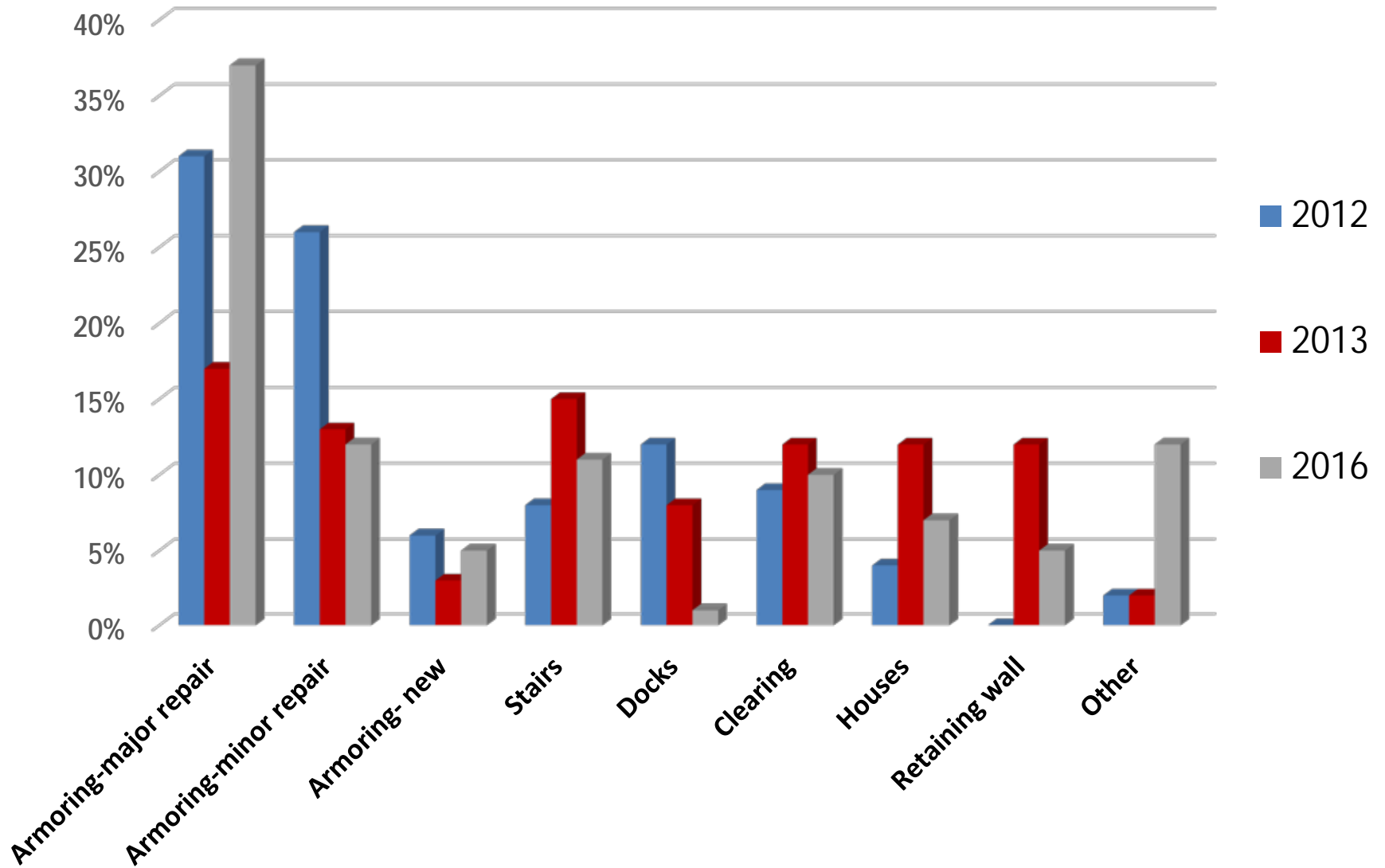
Number of & where changes occurred



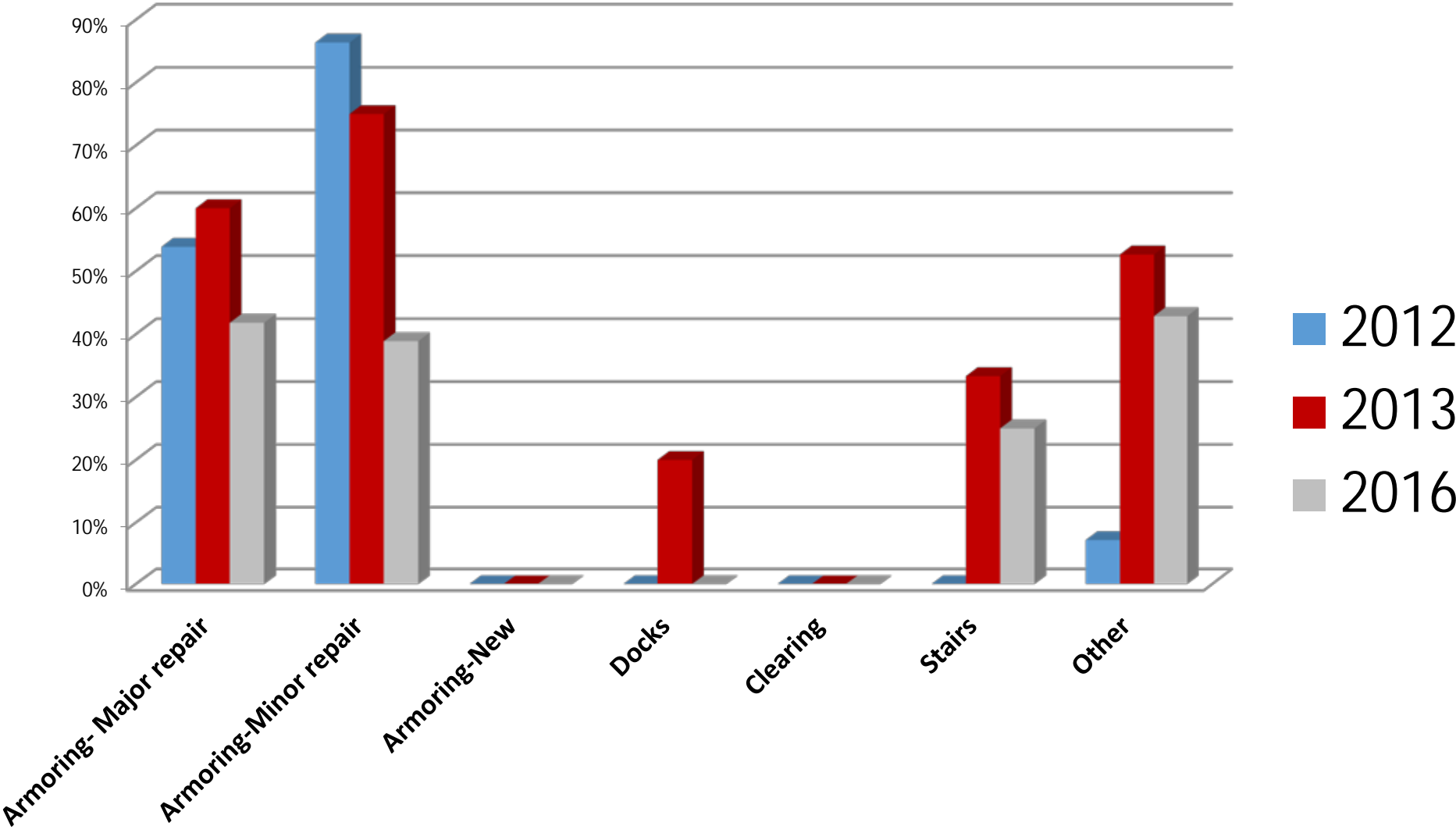
Changes per mile by jurisdiction & study period



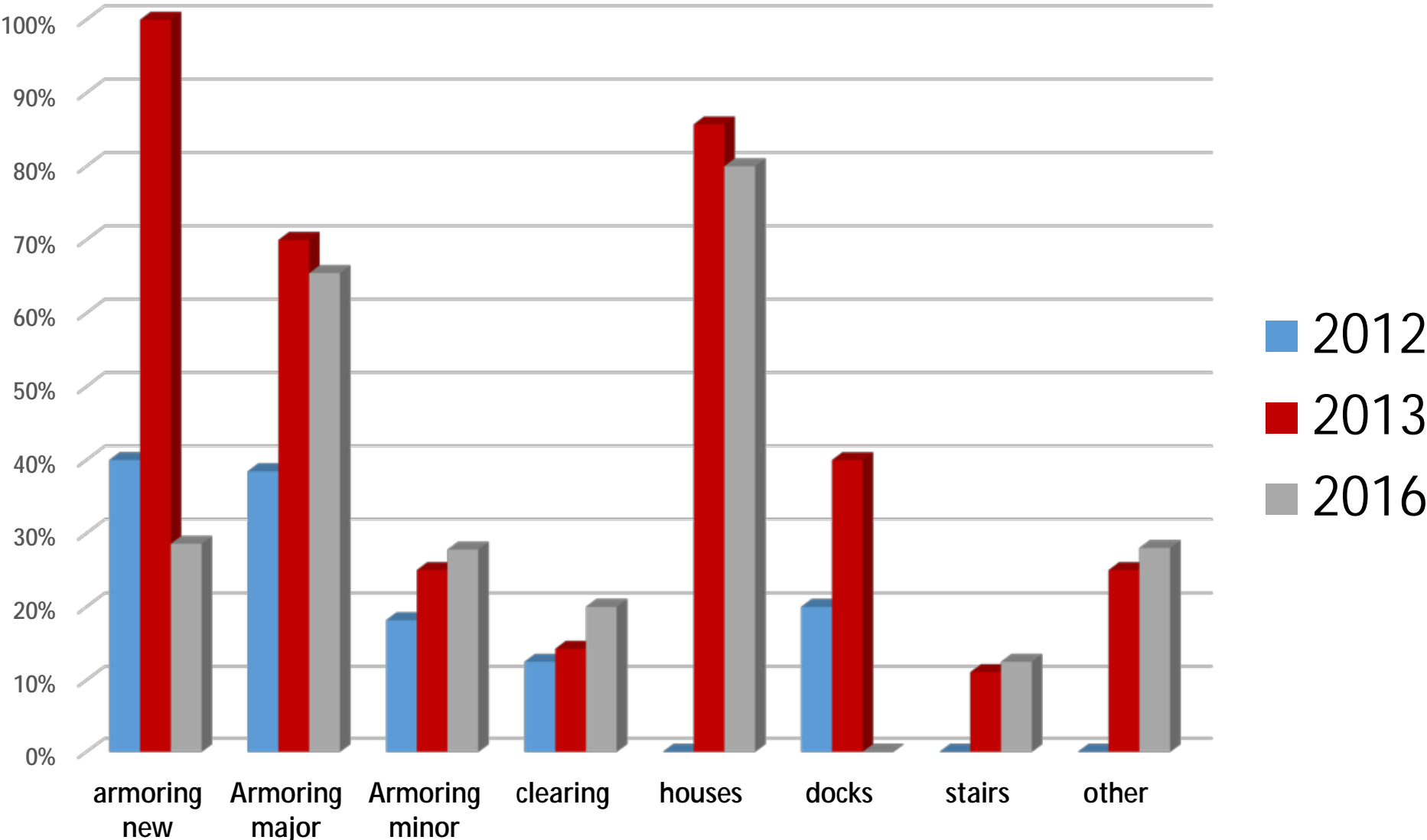
% Type of Change by Year



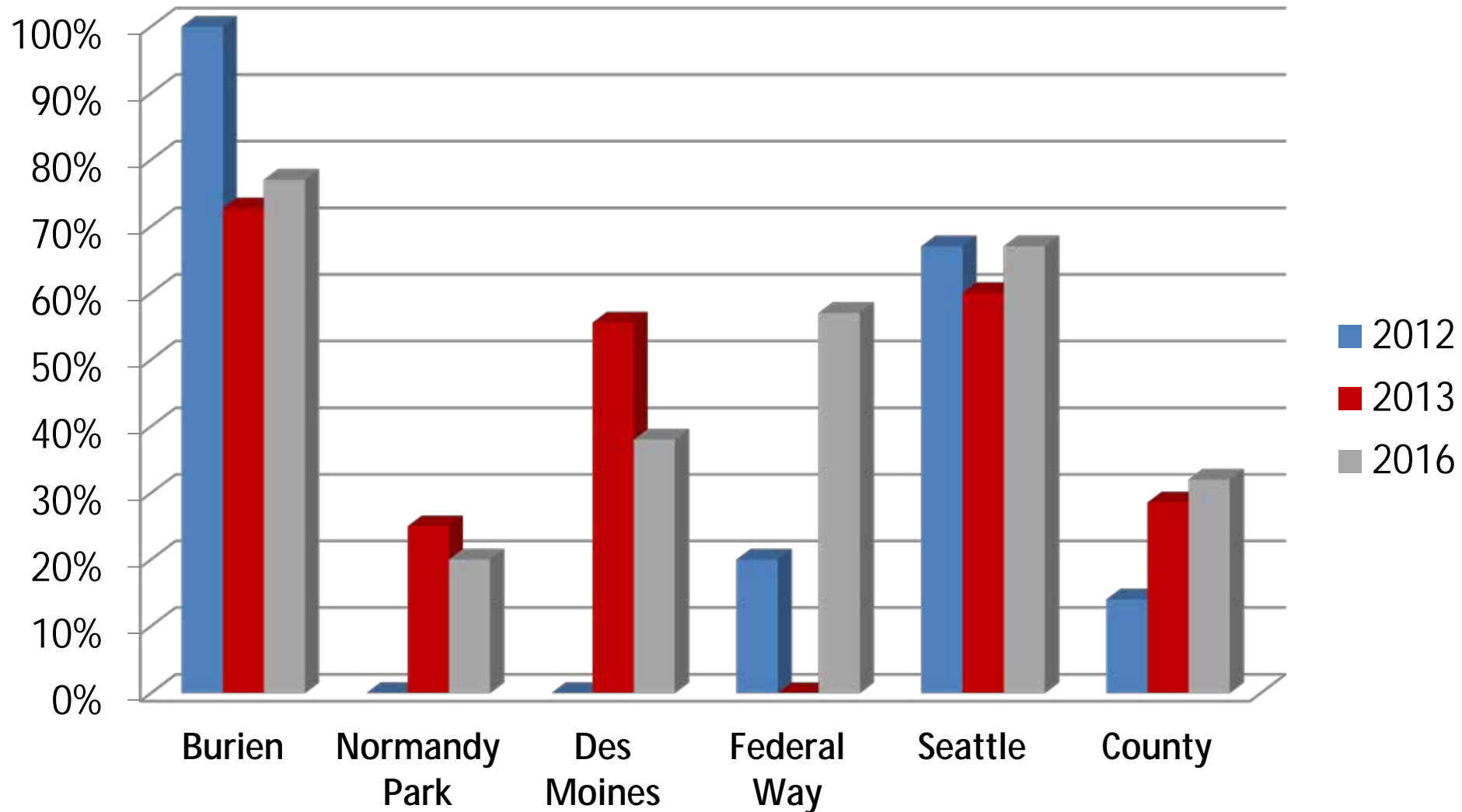
% of Changes by Type With No Apparent Effect



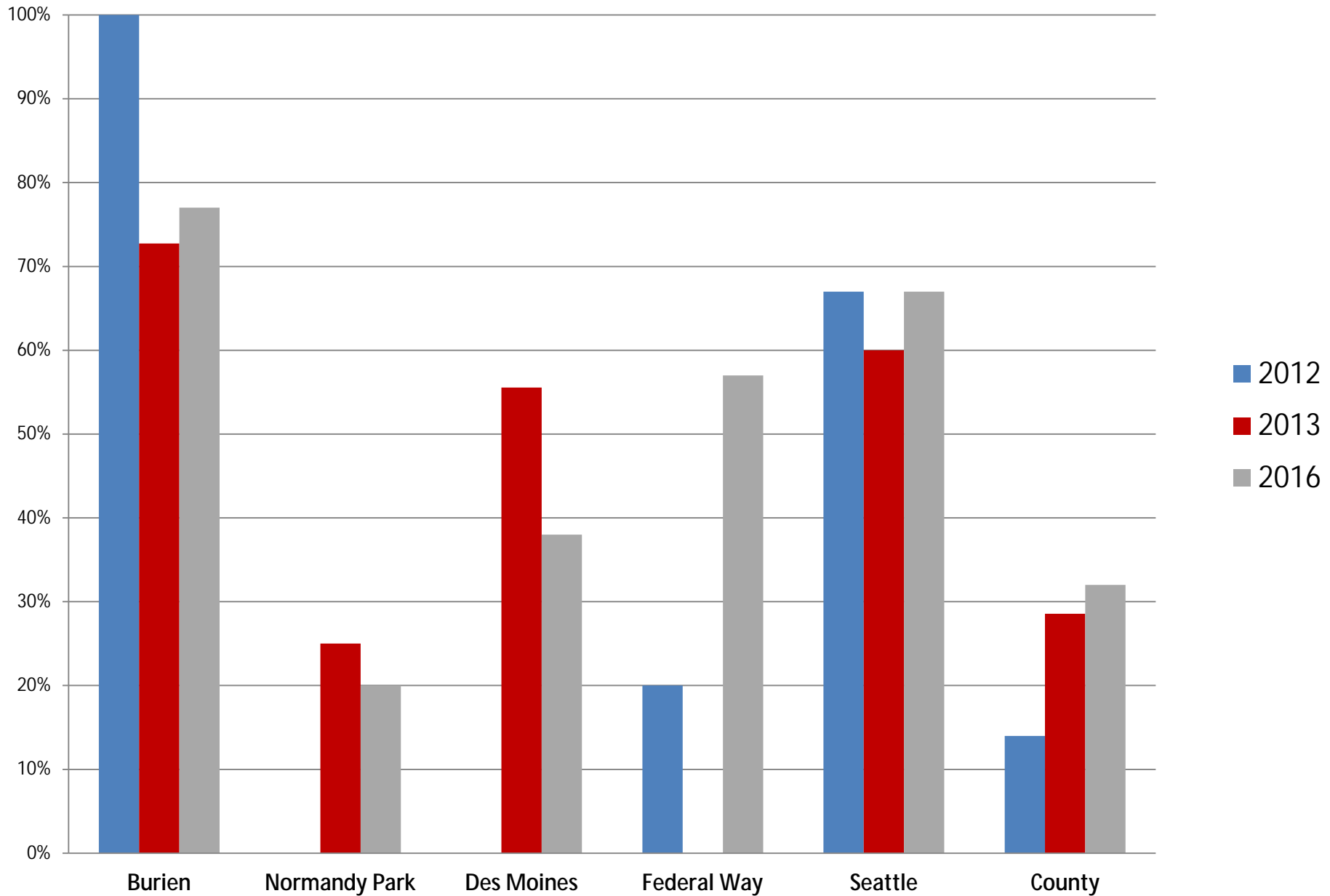
Compliance by Type and Change by Year



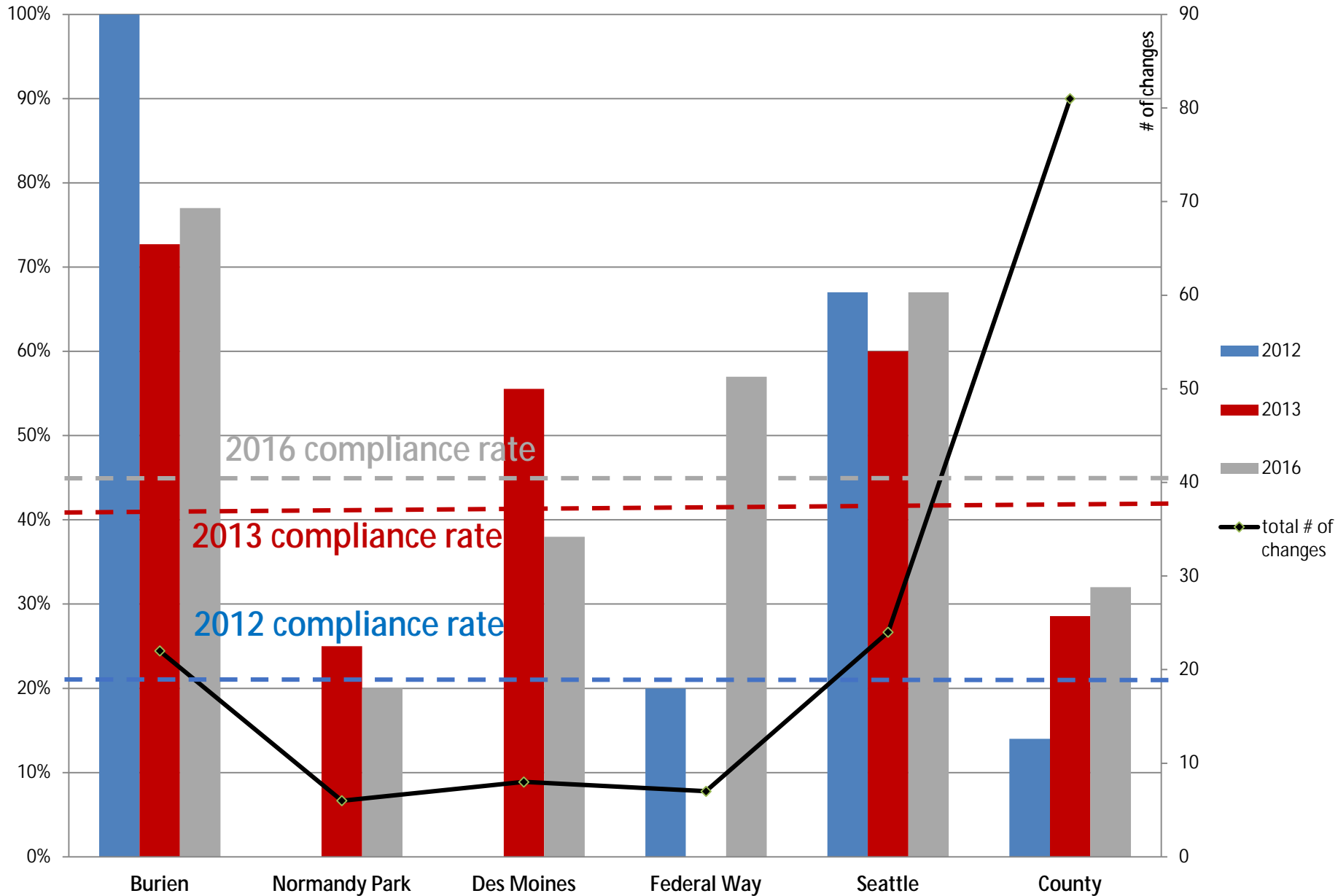
Compliance by Jurisdiction



Compliance by jurisdiction



Compliance by jurisdiction



New armor vs. Restoration? Or How do you classify Seahurst Phase 2?

Jurisdiction	Original shoretype	Current shoretype	Length of change	Permitted?
Des Moines	FBE	M	116	no
Federal Way	FB	M	50	yes
King County	FB	M	110	no
King County	FB	M	25	no
King County	TZ	M	140	partial
King County	TZ	M	30	no
King County	AS	M	100	no
King County	M	FB	82	yes
King County	M	AS	300	yes
Burien	M	M	1500	yes
total new armor			571	
total armor removed			1882	
total (new armor minus restoration)			1311	

Jurisdiction	Original shoretype	Current shoretype	Length of change	Permitted?
Des Moines	FBE	M	116	no
Federal Way	FB	M	50	yes
King County	FB	M	110	no
King County	FB	M	25	no
King County	TZ	M	140	partial
King County	TZ	M	30	no
King County	AS	M	100	no
King County	M	FB	82	yes
King County	M	AS	300	yes
total new armor			571	
total armor removed			382	
total (new armor minus restoration)			-189	



Next steps

- Still compiling compliance data for HPAs
- Next survey will be later this month
- Outreach to different communities
 - Present at Puget Sound Georgia Basin Conference
 - Landowner workshop on Vashon (Fall 2018)
 - Present to WRIA 9 Forum (Fall 2018)
 - A 'How to" boat tour for PS jurisdictions/entities, late summer 2018
- Project ends December of 2018-Final report

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