

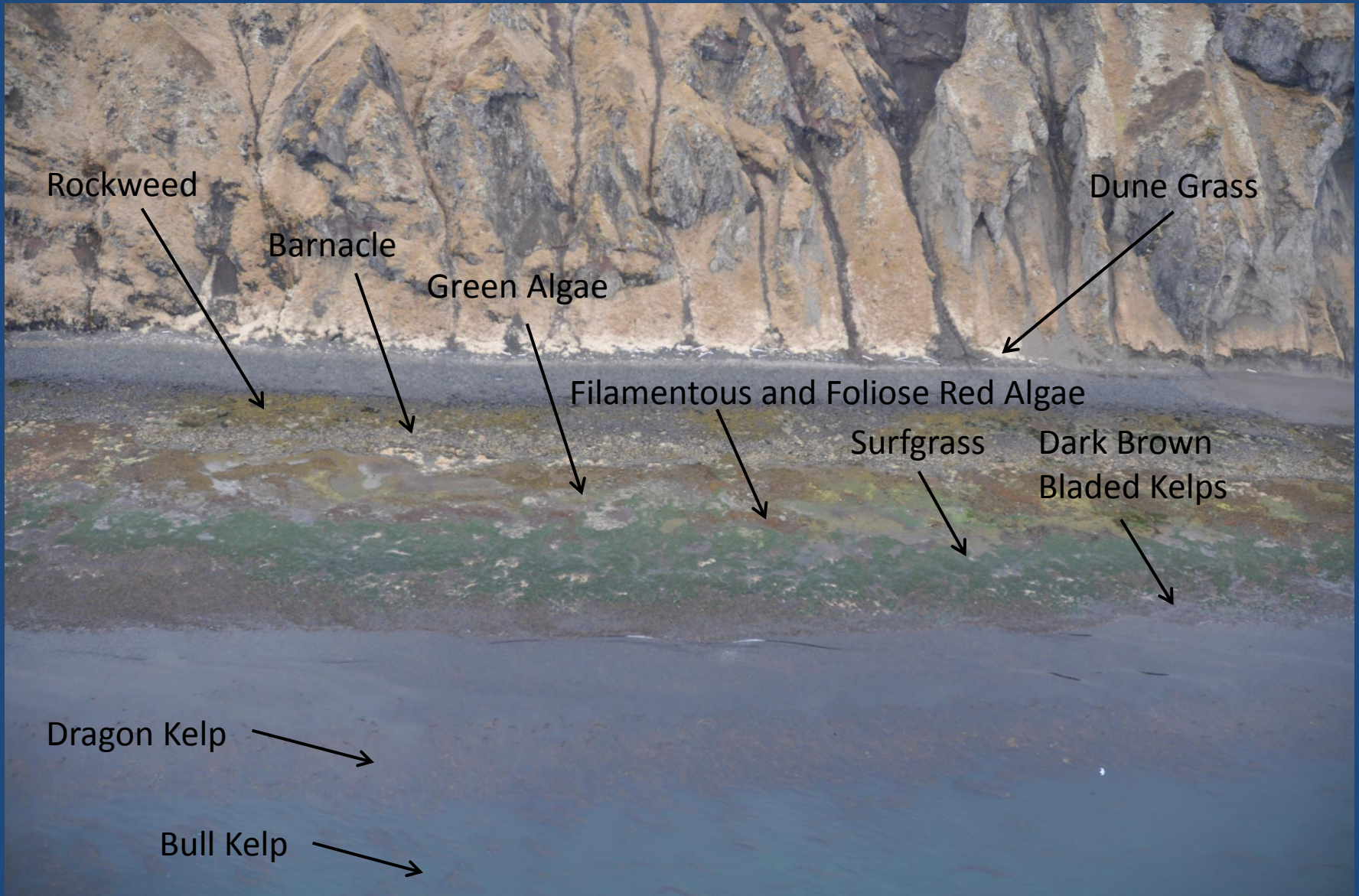


New Bioband Mapping Protocols

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Coastal and Ocean Resources

Biobands



Challenges Over the Years

CONFIDENCE

- Poor imagery
- What if an observed bioband does not fit well into an existing classification?



Challenges Over the Years



NEW, UNIQUE GEOGRAPHIC AREAS

- New biobands
- Freshwater systems

Old Bioband Definitions

Table A-19, continued. Definitions for BIOBANDS for Alaska, in BIOBAND table.

Zone	Bioband		Color	Indicator Species	Physical Description	Exposure	Associate Species
	Name	Code					
B & C	Dark Brown Kelps	CHB	Dark chocolate brown	<i>Laminaria setchelli</i> <i>Lessoniopsis littoralis</i> <i>Laminaria longipes</i> <i>Laminaria yezoensis</i>	Found at higher wave exposures, these stalked kelps grow in the lower intertidal. Blades are leathery, shiny, and smooth. A mixture of species occurs at the moderate wave exposures, while single-species stands of <i>Lessoniopsis</i> occur at high exposures.	SE to VE	<i>Alaria</i> sp. <i>Cymathere</i> sp. <i>Saccharina groenlandica</i> <i>Saccharina sessilis</i> (smooth) <i>Costaria</i> sp. Filamentous and foliose red algae
B & C	Surfgrass	SUR	Bright green	<i>Phyllospadix</i> sp.	Appears in tide pools on rock platforms, often forming extensive beds. This species has a clearly defined upper exposure limit of Semi-Exposed and its presence in units of Exposed wave energy indicates a wide across-shore profile, where wave energy is dissipated by wave run-up across the broad intertidal zone.	SP to SE	Foliose and coralline red algae
B & C	Eelgrass	ZOS	Bright to dark green	<i>Zostera marina</i>	Commonly visible in estuaries, lagoons or channels, generally in areas with fine sediments. Eelgrass can occur in sparse patches or thick dense meadows.	VP to SP	<i>Pilayella</i> sp.
C	Urchin Barrens	URC	Coralline white, underwater	<i>Strongylocentrotus franciscanus</i>	Shows rocky substrate clear of macroalgae. Often has a pink-white color of encrusting coralline red algae. May or may not see urchins.	SP to SE	Encrusting invertebrates
C	Dragon Kelp	ALF	Golden-brown	<i>Eularia fistulosa</i>	Canopy-forming kelp, with winged blades on gas-filled center midrib. Usually associated with silty, cold waters near glacial outflow rivers	SP to SE	<i>Nereocystis luetkeana</i>
C	Giant Kelp	MAC	Golden-brown	<i>Macrocystis pyrifera</i>	Canopy-forming giant kelp, long stipes with multiple floats and fronds. If associated with <i>NER</i> , it occurs inshore of the bull kelp.	P to SE	<i>Nereocystis luetkeana</i> <i>Eularia fistulosa</i>
C	Bull Kelp	NER	Dark brown	<i>Nereocystis luetkeana</i>	Distinctive canopy-forming kelp with many long strap-like blades growing from a single floating bulb atop a long stipe. Can form an extensive canopy in nearshore habitats, usually further offshore than <i>Eularia fistulosa</i> and <i>Macrocystis</i> . Often indicates higher current areas if observed at lower wave exposures.	SP to VE	<i>Eularia fistulosa</i> <i>Macrocystis pyrifera</i>

Note that four lower intertidal biobands (Red Algae, Bleached Red Algae, Soft Brown Kelps, Dark Brown Kelps) have slightly different species compositions in Gulf of Alaska bioareas. See Table A-20 for species lists.


New Bioband Definitions

Table C. Definitions for the intertidal/subtidal vegetation bioband attributes in BIOBAND table (effective from January 1, 2015). This combines biobands used in Oregon State, Washington State, British Columbia and Alaska. Not all biobands are applicable to all areas therefore it is noted in the bioband description if it is specific to a certain region.

Bioband Name			Old Three-Digit Code	Four Digit Code	Zone	Typical Color	Indicator Species	Description	Biological Wave Exposure	Common Associates	
Primary Level	Secondary Level	Tertiary Level									
Intertidal/ Subtidal Vegetation				INSV	B & C	N/A	N/A	Non-specific intertidal or subtidal vegetation that does not fit into a more specific algal bioband or cannot be clearly identified from the imagery.	All	N/A	
		Wetland Vegetation		WEVE	A & upper B	Greens and browns	N/A	Non-specific wetland vegetation in the supratidal zone that does not fit into any more specific wetland bioband or cannot be clearly identified from the imagery.	VP to E	N/A	
			Sedges**	SED	SEGD	A & upper B	Bright green to yellow- green	<i>Carex lyngbyei</i>	Appears in wetlands around lagoons and estuaries. Usually associated with freshwater. This band can exist as a wide flat pure stand or be intermingled with dune grass. Often the PUC band forms a fringe below.	VP to SE	<i>Carex</i> spp.
			Spartina	SPA	SPAR	Upper & mid B	Bright emerald green	<i>Spartina</i> spp.	<i>Spartina</i> -invaded and <i>Spartina</i> -dominated salt marshes and mudflats. Specific to Washington State.	P to SP	N/A
			Salt Marsh**	PUC	SAMA	A & upper B	Light, bright or dark green with red- brown	<i>Puccinellia</i> spp. <i>Plantago maritima</i> <i>Glaux maritime</i> <i>Deschampsia</i> spp.	Appears around estuaries, marshes, and lagoons and is usually associated with freshwater. In some areas, PUC can be sparse vegetation on coarse sediment or a wetter, peaty meadow with associated herbs and sedges.	VP to SE	<i>Carex</i> spp. <i>Potentilla anserine</i> <i>Honckeya peplodes</i> <i>Salicornia depressa</i> <i>Triglochin maritima</i> <i>Spergularia</i> spp. <i>Achillea</i> spp. <i>Dodecatheon</i> spp.
			Salt Marsh (Oregon & Washington State)	TRI	SAMO	A & upper B	Light, bright or dark green with red- brown	<i>Triglochin maritima</i> <i>Distichlis spicata</i> <i>Deschampsia caespitosa</i> <i>Plantago maritima</i> <i>Scirpus americanus</i> <i>Salicornia virginica</i>	Appears around estuaries, marshes, and lagoons, associated with fresh water. Separated as 'high marsh' and 'low marsh' as gradation of assemblages according to elevation/salt water inundation in Oregon, but describes only a 'high marsh' in Washington State. Can be sparse grasses and herbs on coarse sediment or a wetter, peaty meadow with an assemblage of herbs, grasses and sedges. Specific to Oregon and Washington State SZ.	VP to SE	<i>Carex</i> spp. <i>Potentilla pacifica</i> <i>Spergularia marina</i> <i>Juncus</i> spp <i>Eleocharis</i> sp <i>Atriplex patula</i>
		Salt Marsh (BC & Washington State)	SAL	SAMB	A & upper B	Light, bright, or dusty green	<i>Salicornia virginica</i>	Salt-tolerant herbs and grasses associated with freshwater. This band is often associated with estuaries, marshes, and lagoons although it is not uncommon as a fringing meadow in the supratidal. Used to describe a 'low marsh' in Washington State and generally lacking associated grass species in that classification. Specific to BC and Washington State SZ.	SE to VP	<i>Carex</i> spp. <i>Deschampsia</i> sp. <i>Distichlis/</i> <i>Puccinellia</i> sp <i>Leymus mollis</i> <i>Plantago maritima</i> <i>Triglochin maritimum</i>	

New Bioband Definitions

Table C. Con't

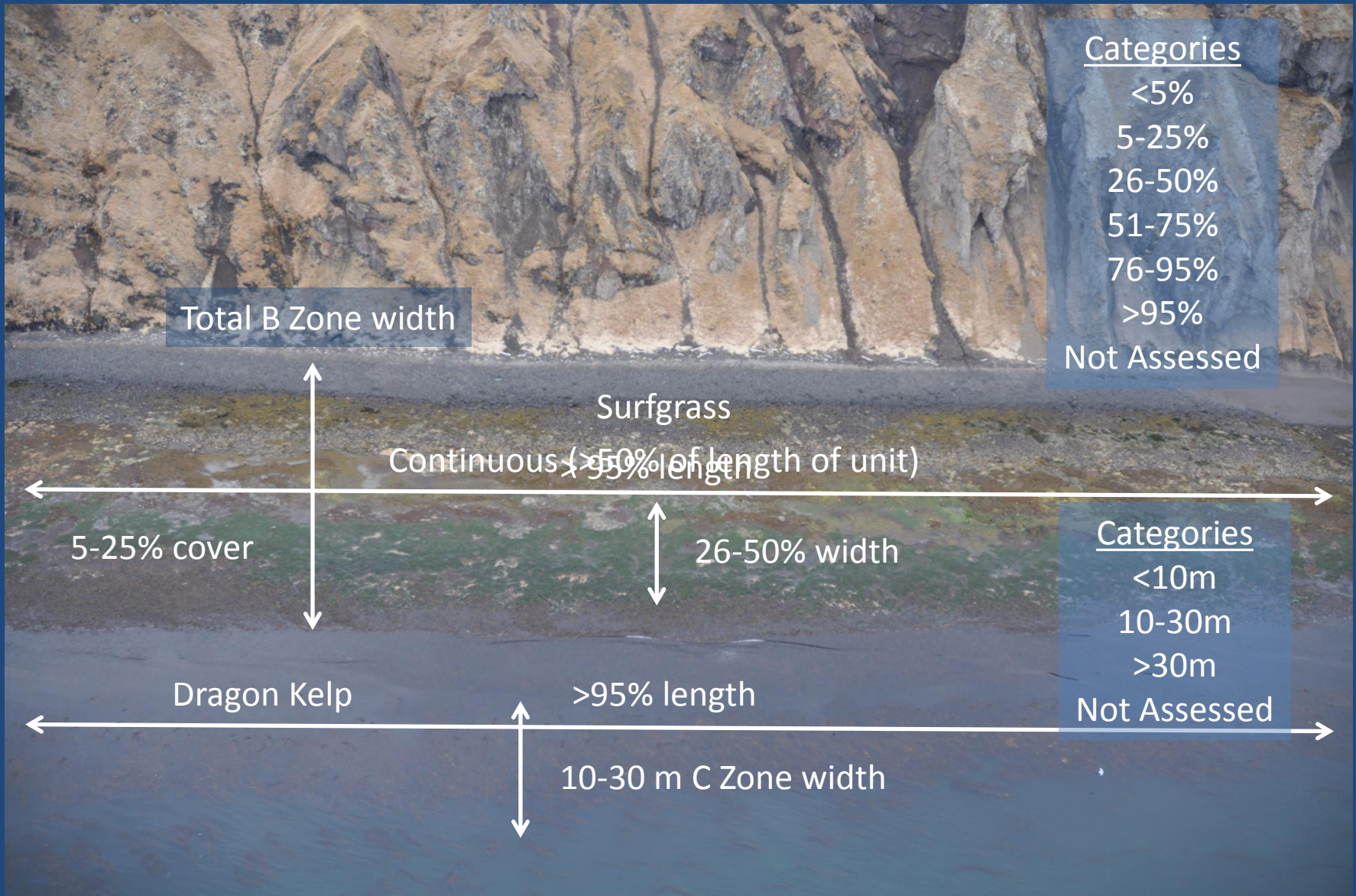
Bioband Name			Old Three-Digit Code	Four Digit Code	Zone	Typical Color	Indicator Sp.	Description	Biological Wave	Associate Species		
Primary Level	Secondary Level	Tertiary Level										
 Intertidal/ Subtidal Vegetation	Rooted Vegetation			ROVE	B & C	Green to green-grey	N/A			N/A		
		Surfgrass	SUR	SURF	B & C	Bright to dark green	<i>Phyllospora</i>	has a clearly defined upper exposure limit of Semi-Exposed and its presence in units of Exposed wave energy indicates a wide across-shore profile, where wave energy is dissipated by wave run-up across the broad intertidal zone.	SP to SE		Foliose and coralline red algae	
		Eelgrass	ZOS	EELG	B & C	Bright to dark green	<i>Zostera marina</i>	Commonly visible in estuaries, lagoons or channels, generally in areas with fine sediments. Eelgrass can occur in sparse patches or thick dense meadows.	VP to SP		<i>Pilayella</i> sp.	
	Brown Bladed Algae				BRBA	B & C	Various shades of brown	N/A	Non-specific bladed brown algae in the lower intertidal and/or shallow subtidal that do not fit in any more specific kelp bioband or cannot be clearly identified from the imagery.	All		N/A
		Alaria	ALA	ALAR	B & C	Dark brown to red-brown	<i>Alaria marginata</i>	Common on bedrock cliffs and platforms, and on boulder/cobble beaches. This band has a distinct ribbon-like texture, and may appear iridescent in some imagery.	SP to E		Foliose red algae <i>Saccharina</i> sp. <i>Laminaria</i> sp.	
		Soft Brown Kelps*	SBR	SOBK	B & C	Brown to yellow-brown to olive	<i>Saccharina latissima</i> <i>Cystoseira</i> sp. <i>Sargassum muticum</i>	This band is defined by non-floating large browns and can form lush bands in semi-protected areas. The kelp fronds have a ruffled appearance and can be encrusted with diatoms and bryozoans giving the blades a 'dusty' appearance.	VP to SE		<i>Alaria</i> sp. <i>Cymathere</i> sp. <i>Saccharina groenlandica</i> <i>Saccharina sessilis</i> (bullate)	
		Dark Brown Kelps*	CHB	DABK	B & C	Dark brown	<i>Laminaria setchelli</i> <i>Lessoniopsis littoralis</i> <i>Laminaria longipes</i> <i>Laminaria yezoensis</i>	Found at higher wave exposures, these stalked kelps grow in the lower intertidal. Blades are leathery, shiny, and smooth. A mixture of species occurs at the moderate wave exposures, while single-species stands of <i>Lessoniopsis</i> occur at high exposures.	SE to VE		<i>Alaria</i> sp. <i>Cymathere</i> sp. <i>Saccharina groenlandica</i> <i>Saccharina sessilis</i> (smooth) <i>Costaria</i> sp. Filamentous and foliose red algae	

Non-specific rooted vegetation in the lower intertidal and/or shallow subtidal that do not fit in any more specific intertidal/subtidal bioband or cannot be clearly identified from the imagery.

New Bioband Table Advantages

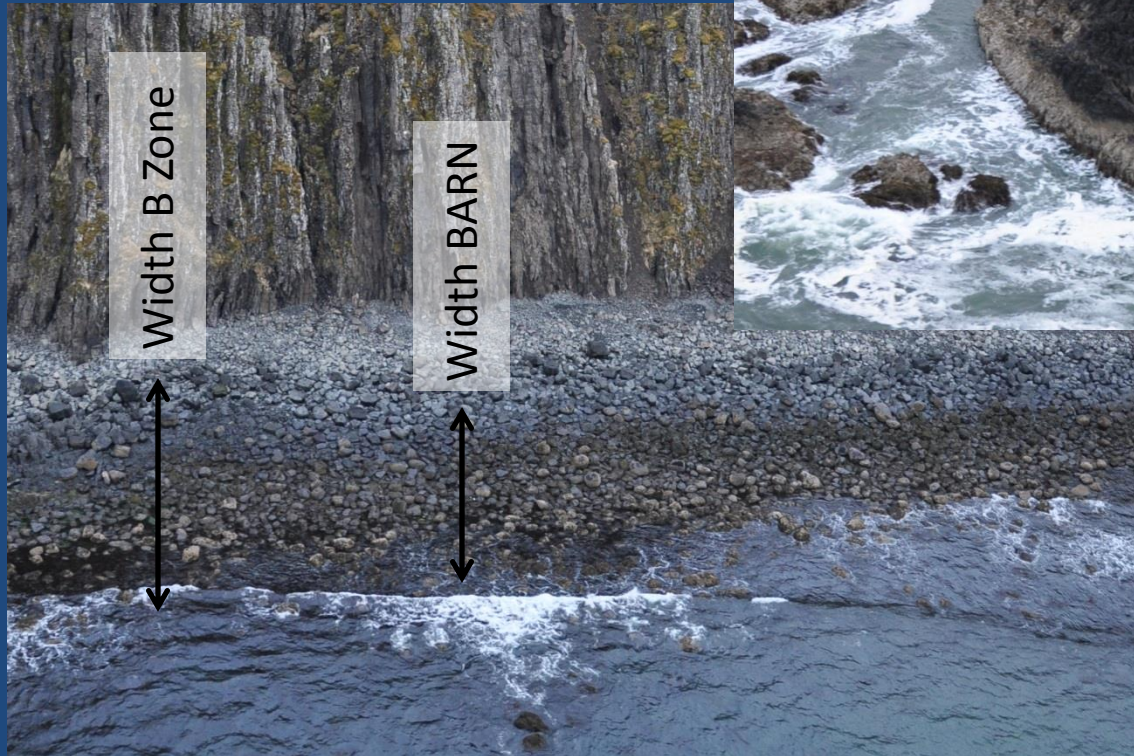
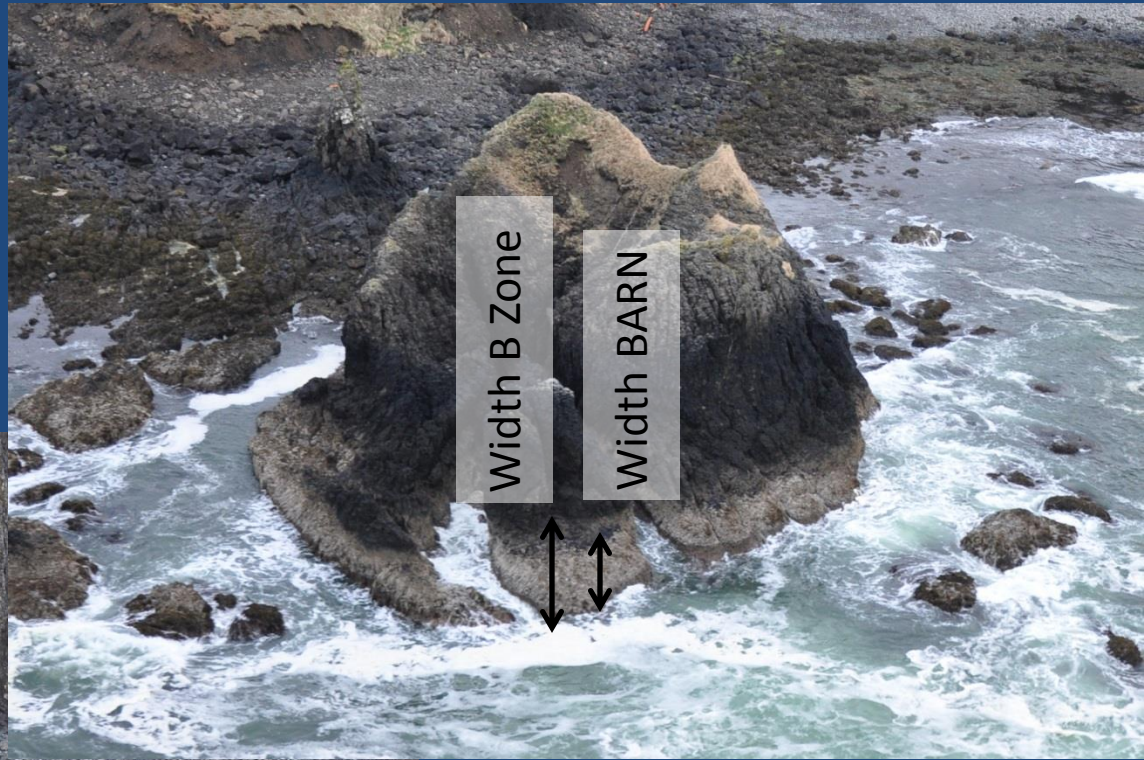
- Different levels allow for a measure of confidence
- Less specific definitions for Primary and Secondary levels means all vegetation fits somewhere
- Names and codes are all consistent
- More flexibility in analysis – biobands can be ‘rolled up’ to higher levels
- **COMPLETELY BACKWARD COMPATIBLE**

New Bioband Metrics



New Bioband Metrics

Length: 76-95%
Width: 76-95%
Percent Cover: 5-25%



Length: >95%
Width: 76-95%
Percent Cover: 76-95%