

Appendix A Image impression datasets & class mappings

SeaClear dataset

Image impression:



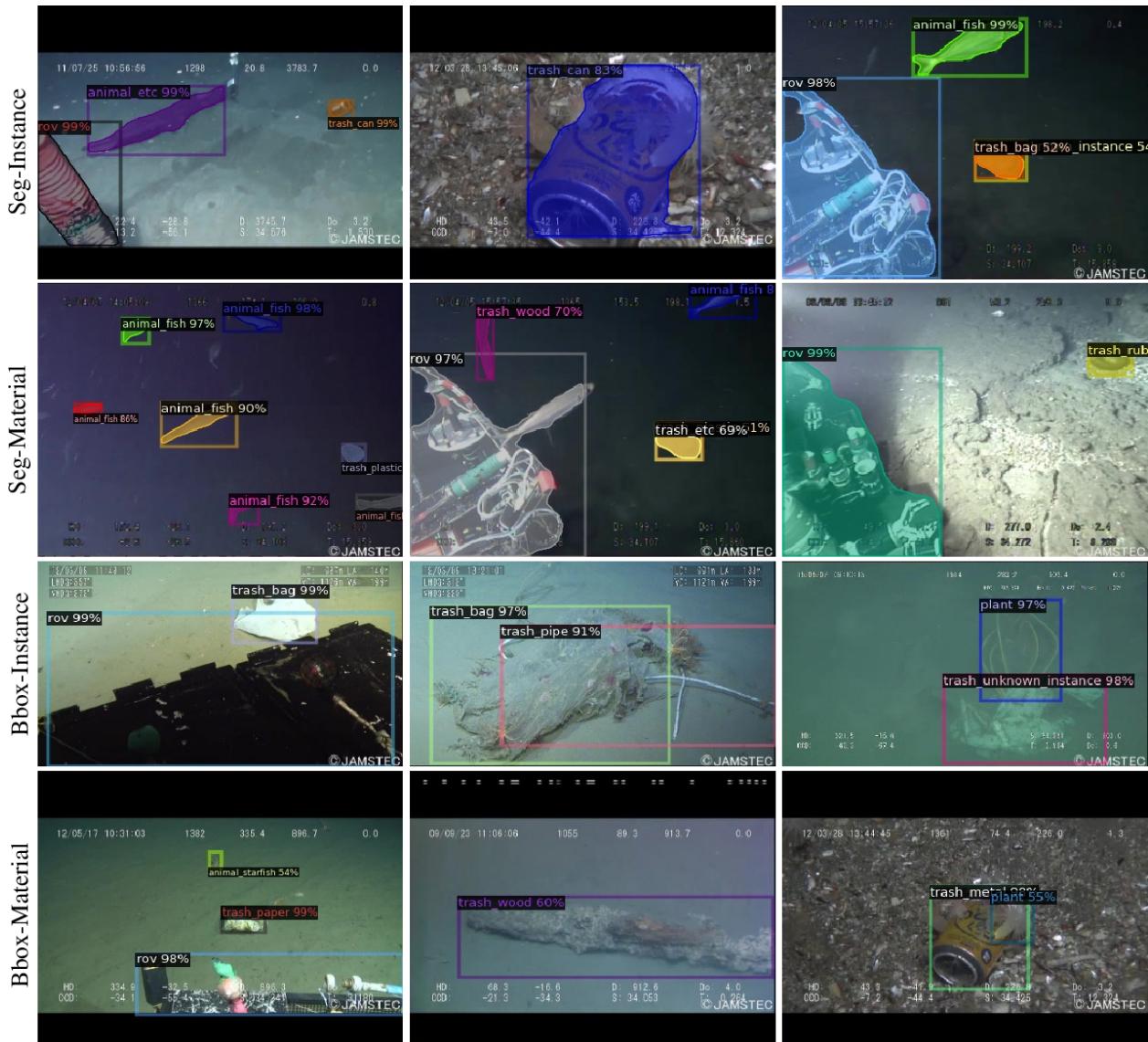
Class mapping:

```
remap_dict = {  
    'can_metal': 'trash',  
    'tarp_plastic': 'trash',  
    'container_plastic': 'trash',  
    'bottle_plastic': 'trash',  
    'tube_cement': 'trash',  
    'plant': 'plant',  
    'container_middle_size_metal': 'trash',  
    'animal/etc': 'animal',  
    'animal/sponge': 'animal',  
    'bottle/glass': 'trash',  
    'wreckage/metal': 'trash',  
    'unknown_instance': 'trash',  
    'pipe/plastic': 'trash',  
    'net/plastic': 'trash',  
    'animal/shells': 'animal',  
    'rope/fiber': 'trash',  
    'animal/urchin': 'animal',  
    'cup/plastic': 'trash',  
    'brick/clay': 'trash',  
    'bag/plastic': 'trash',  
    'sanitarries/plastic': 'trash',  
    'clothing/fiber': 'trash',  
    'cup/ceramic': 'trash',  
    'boot/rubber': 'trash',  
    'tire/rubber': 'trash',  
    'jar/glass': 'trash',  
    'rov/cable': 'rov',  
    'rov/tortuga': 'rov',  
    'branch/wood': 'trash',  
    'furniture/wood': 'trash',  
    'snack(wrapper)/plastic': 'trash',  
}
```

```
'lid_plastic':'trash',
'cardboard_paper':'trash',
'rope_plastic':'trash',
'cable_metal':'trash',
'animal_fish':'animal',
'snack_wrapper_paper':'trash',
'rov_vehicle_leg':'rov',
'rov_bluerov':'rov',
'animal_starfish':'animal'
}
# Setting 'unknown_instance':'trash',
might be suboptimal
```

TrashCan dataset

Image impression:



Class mapping:

```
remap_dict = {
    'rov': 'rov',
    'plant': 'plant',
    'animal_fish': 'animal',
    'animal_starfish': 'animal',
    'animal_shells': 'animal',
    'animal_crab': 'animal',
    'animal_eel': 'animal',
    'animal_etc': 'animal',
    'trash_clothing': 'trash',
    'trash_pipe': 'trash',
    'trash_bottle': 'trash',
    'trash_bag': 'trash',
    'trash_snack_wrapper': 'trash',
```

```
'trash_can':'trash',
'trash_cup':'trash',
'trash_container':'trash',
'trash_unknown_instance':'trash',
'trash_branch':'trash',
'trash_wreckage':'trash',
'trash_tarp':'trash',
'trash_rope':'trash',
'trash_net':'trash'
}
```

ImageNet-1K dataset (selected underwater classes)

Image impression:



Class mapping:

```
remap_dict = {
    'n01440764': 2, # tench
    'n01443537': 2, # goldfish
    'n01484850': 2, # greatwhiteshark
    'n01491361': 2, # tigershark
    'n01494475': 2, # hammerhead
    'n01496331': 2, # electricray
    'n01498041': 2, # stingray
    'n01632777': 2, # axolotl
    'n01641577': 2, # bullfrog
    'n01664065': 2, # loggerhead
    'n01665541': 2, # leatherbackturtle
    'n01667114': 2, # mudturtle
    'n01667778': 2, # terrapin
    'n01669191': 2, # boxturtle
    'n01697457': 2, # Africancrocodile
    'n01698640': 2, # Americanalligator
    'n01737021': 2, # watersnake
    'n01751748': 2, # seasnake
    'n01873310': 2, # platypus
    'n01910747': 2, # jellyfish
    'n01914609': 1, # seaanemone
    'n01917289': 1, # braincoral
    'n01924916': 2, # flatworm
    'n01943899': 2, # conch
    'n01950731': 2, # seaslug
    'n01968897': 2, # chamberednautilus
    'n01978287': 2, # Dungenesscrab
    'n01978455': 2, # rockcrab
    'n01980166': 2, # fiddlercrab
    'n01981276': 2, # kingcrab
    'n01983481': 2, # Americanlobster
    'n01984695': 2, # spinylobster
    'n01985128': 2, # crayfish
```

```

'n01986214': 2, # hermitcrab
'n02066245': 2, # greywhale
'n02071294': 2, # killerwhale
'n02074367': 2, # dugong
'n02077923': 2, # sealion
'n02317335': 2, # starfish
'n02319095': 2, # seaurchin
'n02321529': 2, # seacucumber
'n02444819': 2, # otter
'n02514041': 2, # barracouta
'n02526121': 2, # eel
'n02536864': 2, # coho
'n02606052': 2, # rockbeauty
'n02607072': 2, # anemonefish
'n02640242': 2, # sturgeon
'n02641379': 2, # gar
'n02643566': 2, # lionfish
'n02655020': 2, # puffer
'n02823428': 3, # beerbottle
'n02877765': 3, # bottlecap
'n03958227': 3, # plasticbag
'n03983396': 3, # popbottle
'n04557648': 3, # waterbottle
'n09256479': 1, # coralreef
'n10565667': 2, # scubadiver
}
# I use the following mapping :
{'rov': '0', 'plant': '1',
'animal': '2', 'trash': '3'}
# Here I set corals en alike
(that look like plants but are
acutally animals) as plants/1

```

RUOD dataset

Image impression:



(a) haze-like effects (absorbing and scattering, movement, and electronic noisy)



(b) color casts (yellowness, greenish, and bluish)



(c) light interference (artificial light, uneven illumination, sunshine)



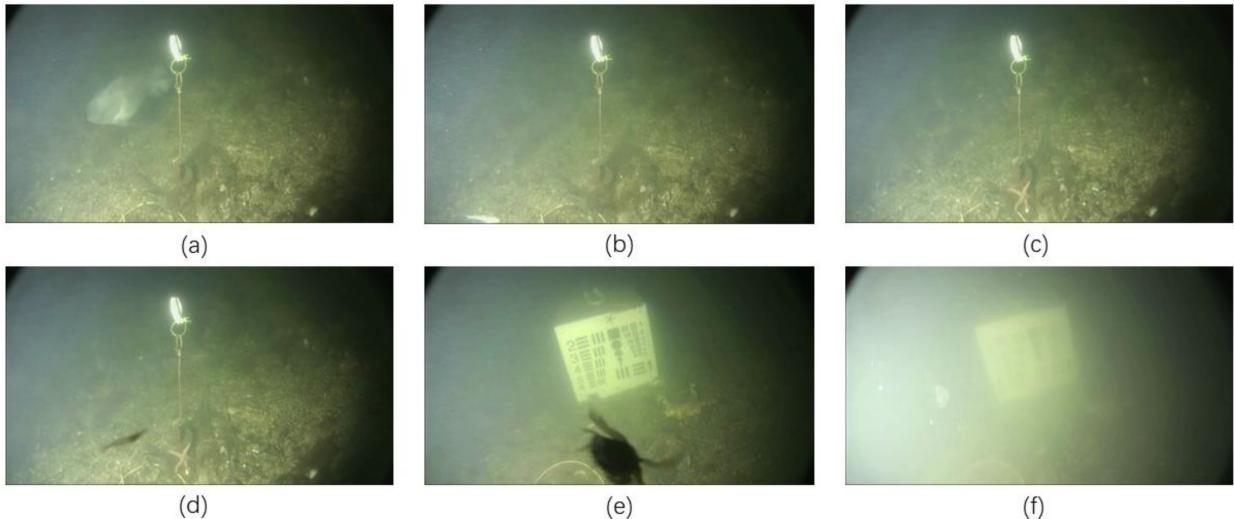
(d) complex marine objects (occlusion, small size, deformation, camouflage)

Class mapping:

```
remap_dict = {
    "holothurian": "animal",
    "echinus": "animal",
    "scallop": "animal",
    "starfish": "animal",
    "fish": "animal",
    "corals": "animal",
    "diver": "animal",
    "cuttlefish": "animal",
    "turtle": "animal",
    "jellyfish": "animal"
}
```

Brackish dataset

Image impression:



Class mapping:

```
remap_dict = {  
    'crab': 'animal',  
    'fish': 'animal',  
    'jellyfish': 'animal',  
    'shrimp': 'animal',  
    'small_fish': 'animal',  
    'starfish': 'animal'  
}
```

Appendix B Effect artifacts on performance

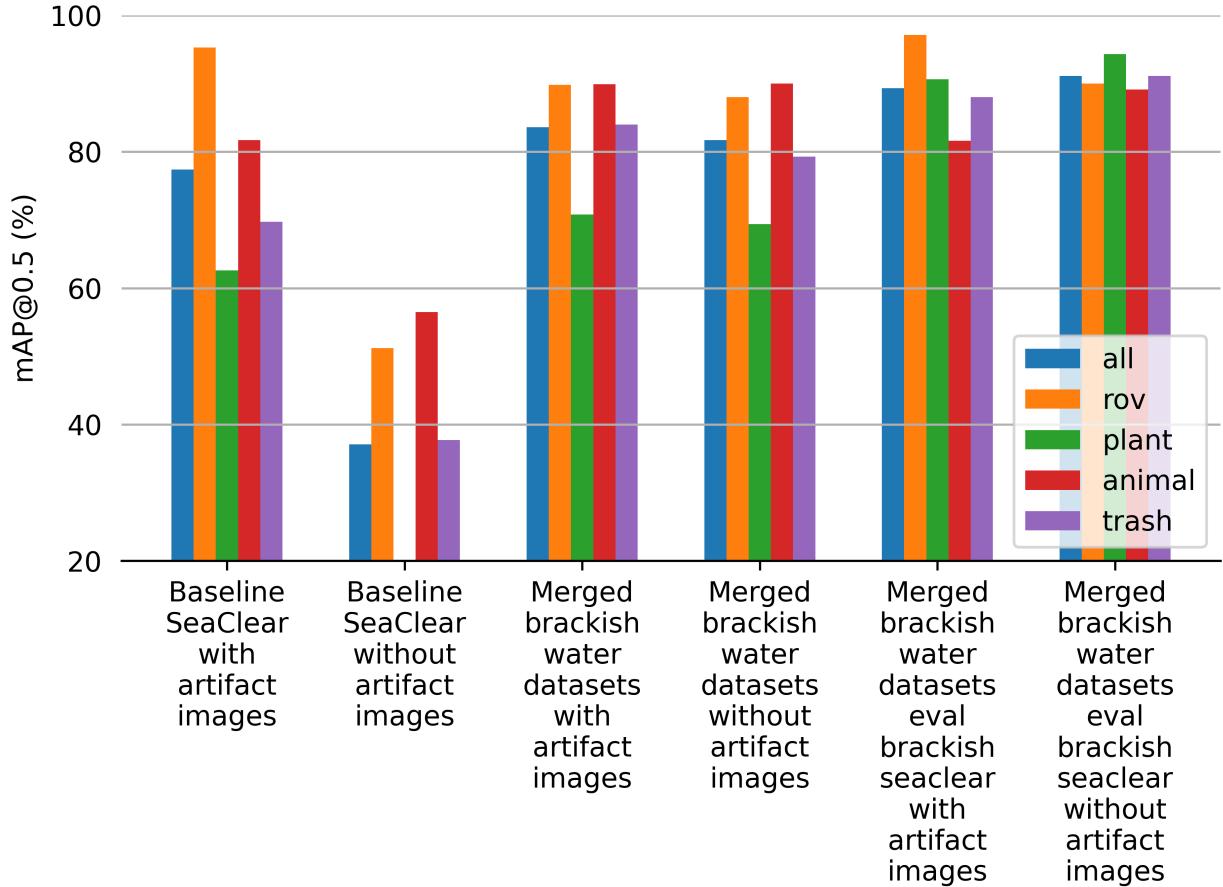


Figure 10: Effect the dirty lens artifacts on model performance.

Figure 10 shows the effect of the lens artifacts discovered in the SeaClear dataset. The results show that removing the artifact images causes a steep decline in performance for the baseline of SeaClear. This can be attributed to the fact that the artifact images comprise 3441 out of the total 8610 images and that the addition of this amount of training images outweighs the effect of the artifact. For the merged brackish water datasets, either evaluated on all datasets or only the brackish portion of the SeaClear dataset, the effect of removing the artifacts is small. This can be attributed to the large dataset on which the model has been trained, causing the removal of the artifact images to have a negligible effect on the performance.

Appendix C Inference examples

Inference video examples can be found here: https://drive.google.com/drive/folders/1Z0ShnJvHNJICsheYkxxQcs_nn0_0_JnJ?usp=sharing

Appendix D Evaluation Results

```
Evaluation Name: yolov6n_eval_exp1_baseline_TrashCan
```

```
Evaluation metrics:
```

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1149 | 2420 | 0.675 | 0.61 | 0.641 | 0.702 | 0.474 |
| rov | 436 | 589 | 0.879 | 0.84 | 0.859 | 0.919 | 0.753 |
| plant | 98 | 102 | 0.807 | 0.45 | 0.578 | 0.529 | 0.293 |
| animal | 304 | 523 | 0.625 | 0.55 | 0.585 | 0.559 | 0.304 |
| trash | 940 | 1206 | 0.881 | 0.71 | 0.786 | 0.799 | 0.544 |

```
Evaluating speed.
```

```
Average pre-process time: 1.96 ms
```

```
Average inference time: 167.26 ms
```

```
Average NMS time: 1.02 ms
```

```
Evaluation Name: yolov6n_eval_exp1_baseline1_replicate_OpenCV
```

```
Evaluation metrics:
```

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1442 | 2988 | 0.727 | 0.57 | 0.639 | 0.687 | 0.462 |
| rov | 524 | 683 | 0.825 | 0.87 | 0.847 | 0.896 | 0.732 |
| plant | 93 | 102 | 0.895 | 0.5 | 0.642 | 0.598 | 0.335 |
| animal | 403 | 667 | 0.589 | 0.47 | 0.523 | 0.5 | 0.272 |
| trash | 1194 | 1536 | 0.749 | 0.72 | 0.734 | 0.757 | 0.507 |

```
Evaluating speed.
```

```
Average pre-process time: 2.11 ms
```

```
Average inference time: 188.07 ms
```

```
Average NMS time: 1.89 ms
```

Evaluation Name: Eval_Results_exp1_baseline2_SeaClear

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1724 | 7193 | 0.846 | 0.62 | 0.716 | 0.774 | 0.559 |
| rov | 237 | 306 | 0.927 | 0.91 | 0.918 | 0.953 | 0.772 |
| plant | 59 | 61 | 1 | 0.5 | 0.667 | 0.626 | 0.467 |
| animal | 611 | 2983 | 0.824 | 0.72 | 0.768 | 0.817 | 0.516 |
| trash | 1450 | 3843 | 0.747 | 0.63 | 0.683 | 0.697 | 0.479 |

Evaluating speed.

Average pre-process time: 3.36 ms

Average inference time: 267.12 ms

Average NMS time: 6.23 ms

Evaluation Name: Eval_Results_exp1_baseline3_Cam1

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1035 | 6485 | 0.43 | 0.47 | 0.449 | 0.371 | 0.214 |
| rov | 149 | 215 | 0.66 | 0.47 | 0.549 | 0.512 | 0.297 |
| plant | 59 | 61 | 0.125 | 0.13 | 0.127 | 0.0305 | 0.0115 |
| animal | 611 | 2983 | 0.672 | 0.5 | 0.573 | 0.565 | 0.329 |
| trash | 849 | 3226 | 0.506 | 0.37 | 0.427 | 0.377 | 0.217 |

Evaluating speed.

Average pre-process time: 2.84 ms

Average inference time: 247.47 ms

Average NMS time: 12.20 ms

Evaluation Name: yolov6n_eval_exp1_crossdataset1

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|---------|------------|
| all | 7083 | 12127 | 0.104 | 0.21 | 0.139 | 0.0635 | 0.0344 |
| rov | 2721 | 3316 | 0.124 | 0.12 | 0.122 | 0.0575 | 0.0309 |
| plant | 482 | 507 | 0.0151 | 0.11 | 0.0265 | 0.00461 | 0.00123 |
| animal | 1476 | 2298 | 0.00497 | 0.09 | 0.00941 | 0.0021 | 0.00084 |
| trash | 5062 | 6006 | 0.274 | 0.3 | 0.286 | 0.19 | 0.105 |

Evaluating speed.

Average pre-process time: 2.33 ms

Average inference time: 199.56 ms

Average NMS time: 5.81 ms

Evaluation Name: yolov6n_eval_exp1_crossdataset2

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|---------|------------|
| all | 8610 | 31549 | 0.221 | 0.41 | 0.287 | 0.175 | 0.135 |
| rov | 807 | 963 | 0.656 | 0.6 | 0.627 | 0.585 | 0.477 |
| plant | 418 | 472 | 0.0176 | 0.18 | 0.0321 | 0.00651 | 0.00271 |
| animal | 3368 | 13318 | 0.0277 | 0.04 | 0.0327 | 0.0057 | 0.00243 |
| trash | 7728 | 16796 | 0.187 | 0.18 | 0.183 | 0.101 | 0.0571 |

Evaluating speed.

Average pre-process time: 2.13 ms
Average inference time: 191.43 ms
Average NMS time: 5.41 ms

Evaluation Name: yolov6n_eval_exp1_Merged_TrashCan SeaClear

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 3164 | 4999 | 0.666 | 0.49 | 0.564 | 0.602 | 0.416 |
| rov | 612 | 774 | 0.862 | 0.82 | 0.84 | 0.903 | 0.745 |
| plant | 93 | 102 | 0.803 | 0.48 | 0.601 | 0.55 | 0.314 |
| animal | 403 | 667 | 0.531 | 0.41 | 0.463 | 0.398 | 0.224 |
| trash | 2828 | 3456 | 0.594 | 0.49 | 0.537 | 0.557 | 0.382 |

Evaluating speed.

Average pre-process time: 0.12 ms
Average inference time: 2.76 ms
Average NMS time: 1.38 ms

Evaluation Name: yolov6n_eval_exp2_ImageNet

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 2900 | 4882 | 0.583 | 0.61 | 0.596 | 0.623 | 0.479 |
| rov | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| plant | 150 | 295 | 0.643 | 0.37 | 0.47 | 0.445 | 0.366 |
| animal | 2500 | 3831 | 0.874 | 0.66 | 0.752 | 0.774 | 0.585 |
| trash | 250 | 756 | 0.771 | 0.53 | 0.628 | 0.65 | 0.487 |

Evaluating speed.

Average pre-process time: 2.22 ms
Average inference time: 261.00 ms
Average NMS time: 1.17 ms

Evaluation Name: yolov6_eval_exp2_ImageNet_TrashCan

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1442 | 2988 | 0.795 | 0.54 | 0.643 | 0.7 | 0.478 |
| rov | 524 | 683 | 0.842 | 0.82 | 0.831 | 0.888 | 0.732 |
| plant | 93 | 102 | 0.864 | 0.5 | 0.634 | 0.613 | 0.371 |
| animal | 403 | 667 | 0.574 | 0.5 | 0.534 | 0.523 | 0.286 |
| trash | 1194 | 1536 | 0.837 | 0.69 | 0.756 | 0.775 | 0.525 |

Evaluating speed.

Average pre-process time: 2.96 ms
Average inference time: 264.58 ms
Average NMS time: 1.85 ms

Evaluation Name: yolov6_eval_exp2_ImageNet_SeaClear

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1722 | 2011 | 0.65 | 0.68 | 0.665 | 0.711 | 0.549 |
| rov | 88 | 91 | 0.863 | 0.9 | 0.881 | 0.928 | 0.759 |
| plant | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| animal | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| trash | 1634 | 1920 | 0.428 | 0.53 | 0.474 | 0.493 | 0.338 |

Evaluating speed.

Average pre-process time: 3.93 ms
Average inference time: 263.47 ms
Average NMS time: 1.38 ms

Evaluation Name: yolov6n_eval_exp2_ImageNet_Merged_TrashCan_SeaClear

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 3164 | 4999 | 0.719 | 0.51 | 0.597 | 0.628 | 0.423 |
| rov | 612 | 774 | 0.851 | 0.79 | 0.819 | 0.866 | 0.709 |
| plant | 93 | 102 | 0.847 | 0.49 | 0.621 | 0.569 | 0.327 |
| animal | 403 | 667 | 0.597 | 0.46 | 0.52 | 0.492 | 0.27 |
| trash | 2828 | 3456 | 0.609 | 0.53 | 0.567 | 0.584 | 0.384 |

Evaluating speed.

Average pre-process time: 1.97 ms
Average inference time: 214.74 ms
Average NMS time: 1.61 ms

Evaluation Name: Eval_Results_exp3_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov6_eval_exp3_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 672 | 3767 | 0.88 | 0.77 | 0.821 | 0.856 | 0.606 |
| rov | 27 | 31 | 0.923 | 0.77 | 0.84 | 0.88 | 0.717 |
| plant | 63 | 64 | 1 | 0.81 | 0.895 | 0.884 | 0.577 |
| animal | 576 | 2154 | 0.763 | 0.77 | 0.767 | 0.822 | 0.508 |
| trash | 557 | 1518 | 0.849 | 0.76 | 0.802 | 0.838 | 0.622 |

Evaluating speed.

Average pre-process time: 1.91 ms
Average inference time: 166.75 ms
Average NMS time: 3.69 ms

Evaluation Name: Eval_Results_exp3_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov6_eval_exp3_Brackish.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 2477 | 7047 | 0.953 | 0.91 | 0.931 | 0.943 | 0.672 |
| rov | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| plant | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| animal | 2477 | 7047 | 0.953 | 0.91 | 0.931 | 0.943 | 0.672 |
| trash | 0 | 0 | -1 | 0.99 | 198 | nan | nan |

Evaluating speed.

Average pre-process time: 1.33 ms
Average inference time: 174.65 ms
Average NMS time: 0.73 ms

Evaluation Name: Eval_Results_exp3_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov6_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1442 | 2988 | 0.706 | 0.55 | 0.618 | 0.671 | 0.456 |
| rov | 524 | 683 | 0.894 | 0.76 | 0.821 | 0.882 | 0.727 |
| plant | 93 | 102 | 0.773 | 0.5 | 0.607 | 0.561 | 0.328 |
| animal | 403 | 667 | 0.59 | 0.46 | 0.517 | 0.497 | 0.272 |
| trash | 1194 | 1536 | 0.823 | 0.66 | 0.733 | 0.745 | 0.499 |

Evaluating speed.

Average pre-process time: 1.90 ms
Average inference time: 183.26 ms
Average NMS time: 1.93 ms

Evaluation Name: Eval_Results_exp3_Merged_Brackish_TrashCan_SeaClear_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4591 | 13802 | 0.852 | 0.68 | 0.756 | 0.817 | 0.582 |
| rov | 551 | 714 | 0.827 | 0.82 | 0.823 | 0.88 | 0.725 |
| plant | 156 | 166 | 0.933 | 0.59 | 0.723 | 0.694 | 0.423 |
| animal | 3456 | 9868 | 0.904 | 0.84 | 0.871 | 0.9 | 0.617 |
| trash | 1751 | 3054 | 0.849 | 0.7 | 0.768 | 0.793 | 0.562 |

Evaluating speed.

Average pre-process time: 1.65 ms
Average inference time: 175.22 ms
Average NMS time: 1.46 ms

Evaluation Name: Eval_Results_exp3_Merged_Brackish_TrashCan_SeaClear_Bistrina_Cam1_yolov6_eval_exp3_Bistrina_Cam1.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1412 | 4673 | 0.891 | 0.81 | 0.849 | 0.893 | 0.661 |
| rov | 58 | 62 | 0.918 | 0.9 | 0.909 | 0.971 | 0.85 |
| plant | 63 | 64 | 0.949 | 0.87 | 0.908 | 0.906 | 0.609 |
| animal | 576 | 2154 | 0.778 | 0.76 | 0.769 | 0.816 | 0.506 |
| trash | 1266 | 2393 | 0.919 | 0.81 | 0.861 | 0.88 | 0.679 |

Evaluating speed.

Average pre-process time: 1.49 ms
Average inference time: 209.93 ms
Average NMS time: 2.55 ms

Evaluation Name: Eval_Results_exp3_Merged_Brackish_TrashCan_SeaClear_Bistrina_Cam1.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 5331 | 14708 | 0.863 | 0.69 | 0.767 | 0.836 | 0.607 |
| rov | 582 | 745 | 0.842 | 0.84 | 0.841 | 0.898 | 0.747 |
| plant | 156 | 166 | 0.919 | 0.61 | 0.733 | 0.708 | 0.448 |
| animal | 3456 | 9868 | 0.905 | 0.84 | 0.871 | 0.899 | 0.617 |
| trash | 2460 | 3929 | 0.883 | 0.76 | 0.817 | 0.84 | 0.617 |

Evaluating speed.

Average pre-process time: 2.11 ms
Average inference time: 221.75 ms
Average NMS time: 1.67 ms

Evaluation Name: Eval_Results_exp3_Merged_RUOD_Brackish_TrashCan_SeaClear_yolov6_eval_exp3_SeaClear_Cam1_goodplit.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1724 | 7193 | 0.708 | 0.68 | 0.694 | 0.749 | 0.507 |
| rov | 237 | 306 | 0.98 | 0.81 | 0.887 | 0.934 | 0.727 |
| plant | 59 | 61 | 0.906 | 0.47 | 0.619 | 0.643 | 0.378 |
| animal | 611 | 2983 | 0.82 | 0.67 | 0.738 | 0.774 | 0.484 |
| trash | 1450 | 3843 | 0.717 | 0.58 | 0.641 | 0.646 | 0.438 |

Evaluating speed.

Average pre-process time: 1.69 ms
Average inference time: 193.86 ms
Average NMS time: 5.74 ms

Evaluation Name: Eval_Results_exp3_Merged_RUOD_Brackish_TrashCan_SeaClear.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 8441 | 29871 | 0.674 | 0.67 | 0.672 | 0.722 | 0.511 |
| rov | 612 | 774 | 0.873 | 0.77 | 0.818 | 0.869 | 0.698 |
| plant | 491 | 1801 | 0.73 | 0.58 | 0.647 | 0.654 | 0.452 |
| animal | 5633 | 23840 | 0.863 | 0.75 | 0.803 | 0.832 | 0.528 |
| trash | 2828 | 3456 | 0.584 | 0.5 | 0.539 | 0.532 | 0.366 |

Evaluating speed.

Average pre-process time: 1.40 ms
Average inference time: 192.54 ms
Average NMS time: 2.84 ms

Evaluation Name: Eval_Results_exp3_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov6_eval_exp3_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 311 | 1298 | 0.613 | 0.62 | 0.616 | 0.669 | 0.436 |
| rov | 118 | 147 | 0.965 | 0.94 | 0.952 | 0.98 | 0.873 |
| plant | 31 | 37 | 0.64 | 0.43 | 0.514 | 0.476 | 0.243 |
| animal | 32 | 195 | 0.649 | 0.49 | 0.558 | 0.541 | 0.228 |
| trash | 287 | 919 | 0.738 | 0.63 | 0.68 | 0.679 | 0.399 |

Evaluating speed.

Average pre-process time: 7.01 ms
Average inference time: 547.72 ms
Average NMS time: 17.80 ms

Evaluation Name: Eval_Results_exp3_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov6_eval_exp3_RUOD.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 2800 | 17825 | 0.739 | 0.67 | 0.703 | 0.733 | 0.482 |
| rov | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| plant | 398 | 1699 | 0.74 | 0.58 | 0.65 | 0.666 | 0.466 |
| animal | 2753 | 16126 | 0.841 | 0.71 | 0.77 | 0.8 | 0.498 |
| trash | 0 | 0 | -1 | 0.99 | 198 | nan | nan |

Evaluating speed.

Average pre-process time: 6.51 ms
Average inference time: 1211.40 ms
Average NMS time: 18.74 ms

Evaluation Name: Eval_Results_exp3_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov6_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1442 | 2988 | 0.727 | 0.48 | 0.578 | 0.635 | 0.428 |
| rov | 524 | 683 | 0.794 | 0.81 | 0.802 | 0.862 | 0.706 |
| plant | 93 | 102 | 0.933 | 0.41 | 0.57 | 0.523 | 0.293 |
| animal | 403 | 667 | 0.6 | 0.43 | 0.501 | 0.444 | 0.248 |
| trash | 1194 | 1536 | 0.778 | 0.63 | 0.696 | 0.71 | 0.466 |

Evaluating speed.

Average pre-process time: 5.36 ms
Average inference time: 551.44 ms
Average NMS time: 11.23 ms

Evaluation Name: Eval_Results_exp3_Merged_RUOD_TrashCan_SeaClear_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.755 | 0.67 | 0.71 | 0.756 | 0.53 |
| rov | 642 | 830 | 0.827 | 0.83 | 0.829 | 0.889 | 0.743 |
| plant | 522 | 1838 | 0.709 | 0.59 | 0.644 | 0.653 | 0.453 |
| animal | 3188 | 16988 | 0.839 | 0.69 | 0.757 | 0.784 | 0.486 |
| trash | 1481 | 2455 | 0.753 | 0.63 | 0.686 | 0.696 | 0.44 |

Evaluating speed.

Average pre-process time: 5.36 ms
Average inference time: 551.44 ms
Average NMS time: 11.23 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov6_eval_exp3_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 672 | 3767 | 0.897 | 0.86 | 0.878 | 0.911 | 0.682 |
| rov | 27 | 31 | 0.848 | 0.9 | 0.873 | 0.9 | 0.768 |
| plant | 63 | 64 | 0.968 | 0.93 | 0.948 | 0.943 | 0.68 |
| animal | 576 | 2154 | 0.871 | 0.83 | 0.85 | 0.891 | 0.576 |
| trash | 557 | 1518 | 0.922 | 0.85 | 0.885 | 0.911 | 0.706 |

Evaluating speed.

Average pre-process time: 6.67 ms
Average inference time: 1521.53 ms
Average NMS time: 5.82 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov6_eval_exp3_Brackish.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 2477 | 7047 | 0.968 | 0.94 | 0.954 | 0.97 | 0.747 |
| rov | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| plant | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| animal | 2477 | 7047 | 0.968 | 0.94 | 0.954 | 0.97 | 0.747 |
| trash | 0 | 0 | -1 | 0.99 | 198 | nan | nan |

Evaluating speed.

Average pre-process time: 6.87 ms
Average inference time: 1603.51 ms
Average NMS time: 2.04 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov6_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1442 | 2988 | 0.821 | 0.59 | 0.687 | 0.739 | 0.512 |
| rov | 524 | 683 | 0.947 | 0.78 | 0.855 | 0.904 | 0.767 |
| plant | 93 | 102 | 0.951 | 0.56 | 0.705 | 0.695 | 0.412 |
| animal | 403 | 667 | 0.612 | 0.54 | 0.574 | 0.551 | 0.312 |
| trash | 1194 | 1536 | 0.843 | 0.75 | 0.794 | 0.806 | 0.555 |

Evaluating speed.

Average pre-process time: 7.25 ms
Average inference time: 1621.39 ms
Average NMS time: 3.64 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_Brackish_TrashCan_SeaClear_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4591 | 13802 | 0.909 | 0.75 | 0.822 | 0.875 | 0.651 |
| rov | 551 | 714 | 0.852 | 0.86 | 0.856 | 0.903 | 0.765 |
| plant | 156 | 166 | 0.91 | 0.72 | 0.804 | 0.805 | 0.52 |
| animal | 3456 | 9868 | 0.938 | 0.88 | 0.908 | 0.934 | 0.687 |
| trash | 1751 | 3054 | 0.896 | 0.79 | 0.84 | 0.86 | 0.632 |

Evaluating speed.

Average pre-process time: 1.89 ms
Average inference time: 559.59 ms
Average NMS time: 1.15 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_Brackish_TrashCan_SeaClear_Bistrina_Cam1_yolov6_eval_exp3_Bistrina_Cam1.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1412 | 4673 | 0.929 | 0.87 | 0.899 | 0.939 | 0.715 |
| rov | 58 | 62 | 0.922 | 0.95 | 0.936 | 0.975 | 0.867 |
| plant | 63 | 64 | 0.952 | 0.93 | 0.941 | 0.968 | 0.681 |
| animal | 576 | 2154 | 0.882 | 0.83 | 0.855 | 0.89 | 0.576 |
| trash | 1266 | 2393 | 0.945 | 0.88 | 0.911 | 0.922 | 0.736 |

Evaluating speed.

Average pre-process time: 1.90 ms
Average inference time: 575.45 ms
Average NMS time: 1.38 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_Brackish_TrashCan_SeaClear_Bistrina_Cam1.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 5331 | 14708 | 0.851 | 0.78 | 0.814 | 0.874 | 0.662 |
| rov | 582 | 745 | 0.862 | 0.88 | 0.871 | 0.915 | 0.781 |
| plant | 156 | 166 | 0.981 | 0.63 | 0.767 | 0.768 | 0.507 |
| animal | 3456 | 9868 | 0.932 | 0.89 | 0.911 | 0.936 | 0.689 |
| trash | 2460 | 3929 | 0.916 | 0.82 | 0.865 | 0.879 | 0.67 |

Evaluating speed.

Average pre-process time: 2.20 ms
Average inference time: 673.31 ms
Average NMS time: 1.17 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_RUOD_Brackish_TrashCan_SeaClear_yolov6_eval_exp3_SeaClear_Cam1_goodplit.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1724 | 7193 | 0.868 | 0.76 | 0.811 | 0.854 | 0.634 |
| rov | 237 | 306 | 0.958 | 0.82 | 0.884 | 0.877 | 0.76 |
| plant | 59 | 61 | 0.9 | 0.88 | 0.89 | 0.899 | 0.65 |
| animal | 611 | 2983 | 0.883 | 0.79 | 0.834 | 0.879 | 0.581 |
| trash | 1450 | 3843 | 0.847 | 0.69 | 0.761 | 0.763 | 0.545 |

Evaluating speed.

Average pre-process time: 1.21 ms
Average inference time: 554.33 ms
Average NMS time: 2.49 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_RUOD_Brackish_TrashCan_SeaClear.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 8441 | 29871 | 0.648 | 0.71 | 0.678 | 0.737 | 0.545 |
| rov | 612 | 774 | 0.887 | 0.77 | 0.824 | 0.849 | 0.718 |
| plant | 491 | 1801 | 0.733 | 0.64 | 0.683 | 0.702 | 0.509 |
| animal | 5633 | 23840 | 0.898 | 0.8 | 0.846 | 0.88 | 0.593 |
| trash | 2828 | 3456 | 0.646 | 0.49 | 0.557 | 0.517 | 0.359 |

Evaluating speed.

Average pre-process time: 2.54 ms
Average inference time: 741.53 ms
Average NMS time: 1.98 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov6_eval_exp3_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 311 | 1298 | 0.812 | 0.67 | 0.734 | 0.793 | 0.543 |
| rov | 118 | 147 | 1 | 0.96 | 0.98 | 0.986 | 0.915 |
| plant | 31 | 37 | 0.889 | 0.64 | 0.744 | 0.736 | 0.441 |
| animal | 32 | 195 | 0.809 | 0.56 | 0.662 | 0.669 | 0.319 |
| trash | 287 | 919 | 0.792 | 0.73 | 0.76 | 0.783 | 0.498 |

Evaluating speed.

Average pre-process time: 7.09 ms
Average inference time: 1590.85 ms
Average NMS time: 7.48 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov6_eval_exp3_RUOD.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 2800 | 17825 | 0.756 | 0.72 | 0.737 | 0.775 | 0.532 |
| rov | 0 | 0 | -1 | 0.99 | 198 | nan | nan |
| plant | 398 | 1699 | 0.723 | 0.65 | 0.685 | 0.704 | 0.514 |
| animal | 2753 | 16126 | 0.859 | 0.76 | 0.806 | 0.846 | 0.55 |
| trash | 0 | 0 | -1 | 0.99 | 198 | nan | nan |

Evaluating speed.

Average pre-process time: 7.44 ms
Average inference time: 1779.00 ms
Average NMS time: 8.92 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov6_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 1442 | 2988 | 0.733 | 0.58 | 0.648 | 0.702 | 0.491 |
| rov | 524 | 683 | 0.878 | 0.84 | 0.858 | 0.9 | 0.763 |
| plant | 93 | 102 | 0.943 | 0.49 | 0.645 | 0.57 | 0.353 |
| animal | 403 | 667 | 0.682 | 0.54 | 0.603 | 0.567 | 0.321 |
| trash | 1194 | 1536 | 0.777 | 0.74 | 0.758 | 0.77 | 0.529 |

Evaluating speed.

Average pre-process time: 7.16 ms

Average inference time: 1605.85 ms

Average NMS time: 4.60 ms

Evaluation Name: Eval_Results_exp3_v6s_Merged_RUOD_TrashCan_SeaClear_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Evaluating speed.

Average pre-process time: 2.21 ms

Average inference time: 683.25 ms

Average NMS time: 2.96 ms

Evaluation Name: Eval_Results_exp3_v7t_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 323.0/1.3/324.3 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_Brackish.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 786.5/2.8/789.3 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 1303.0/1.6/1304.6 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_Brackish_TrashCan_SeaClear_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 299.8/0.9/300.7 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_RUOD_Brackish_TrashCan_SeaClear_yolov7_eval_exp3_SeaClear_Cam1_goodplit.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 249.8/0.9/250.7 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_RUOD_Brackish_TrashCan_SeaClear.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 285.6/0.9/286.5 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 348.2/1.9/350.1 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_RUOD.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 304.6/1.3/305.9 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 275.1/0.8/275.9 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v7t_Merged_RUOD_TrashCan_SeaClear_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 380.1/1.4/381.5 ms inference/NMS/total per 640x640 image at batch-size 32

Evaluation Name: Eval_Results_exp3_v8n_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.0ms preprocess, 151.5ms inference, 0.0ms loss, 1.1ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_Brackish.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.0ms preprocess, 150.0ms inference, 0.0ms loss, 0.8ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.2ms preprocess, 159.5ms inference, 0.0ms loss, 0.9ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_Brackish_TrashCan_SeaClear_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.3ms preprocess, 187.1ms inference, 0.0ms loss, 1.1ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_RUOD_Brackish_TrashCan_SeaClear_yolov7_eval_exp3_SeaClear_Cam1.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 1.8ms preprocess, 144.7ms inference, 0.0ms loss, 1.0ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_RUOD_Brackish_TrashCan_SeaClear.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.0ms preprocess, 159.7ms inference, 0.0ms loss, 0.9ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.2ms preprocess, 170.2ms inference, 0.0ms loss, 1.2ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_RUOD.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.6ms preprocess, 176.9ms inference, 0.0ms loss, 1.3ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.5ms preprocess, 524.5ms inference, 0.0ms loss, 1.0ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8n_Merged_RUOD_TrashCan_SeaClear_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.3ms preprocess, 166.7ms inference, 0.0ms loss, 1.2ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.2ms preprocess, 478.5ms inference, 0.0ms loss, 0.8ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_Brackish.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.4ms preprocess, 1129.7ms inference, 0.0ms loss, 1.0ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_Brackish_TrashCan_SeaClear_Bistrina_yolov7_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.3ms preprocess, 452.6ms inference, 0.0ms loss, 0.8ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_Brackish_TrashCan_SeaClear_Bistrina.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.3ms preprocess, 559.7ms inference, 0.0ms loss, 0.9ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_RUOD_Brackish_TrashCan_SeaClear_yolov7_eval_exp3_SeaClear_Cam1.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 1.8ms preprocess, 415.4ms inference, 0.0ms loss, 0.8ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_RUOD_Brackish_TrashCan_SeaClear.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.2ms preprocess, 468.9ms inference, 0.0ms loss, 0.9ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.0ms preprocess, 390.6ms inference, 0.0ms loss, 0.8ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_RUOD.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.8ms preprocess, 552.9ms inference, 0.0ms loss, 1.1ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_RUOD_TrashCan_SeaClear_Lokrum_yolov7_eval_exp3_TrashCan.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.0ms preprocess, 413.9ms inference, 0.0ms loss, 0.8ms postprocess per image

Evaluation Name: Eval_Results_exp3_v8s_Merged_RUOD_TrashCan_SeaClear_Lokrum.txt

Evaluation metrics:

| Class | Labeled_images | Labels | P@.5iou | R@.5iou | F1@.5iou | mAP@.5 | mAP@.5:.95 |
|--------|----------------|--------|---------|---------|----------|--------|------------|
| all | 4553 | 22111 | 0.79 | 0.73 | 0.759 | 0.805 | 0.588 |
| rov | 642 | 830 | 0.896 | 0.86 | 0.878 | 0.919 | 0.796 |
| plant | 522 | 1838 | 0.724 | 0.64 | 0.68 | 0.696 | 0.501 |
| animal | 3188 | 16988 | 0.85 | 0.75 | 0.797 | 0.834 | 0.539 |
| trash | 1481 | 2455 | 0.796 | 0.72 | 0.756 | 0.772 | 0.515 |

Speed: 2.5ms preprocess, 502.6ms inference, 0.0ms loss, 0.9ms postprocess per image