APEC WORKSHOP 2020
Capacity Building on Global Marine Debris Monitoring and Modeling: Support Protection of The Marine Environment
18 – 20 February 2020, Discovery Kartika Plaza Hotel, Bali, Indonesia

Marine Plastic Debris Sources and Modelling Towards -70% Reduction by 2025

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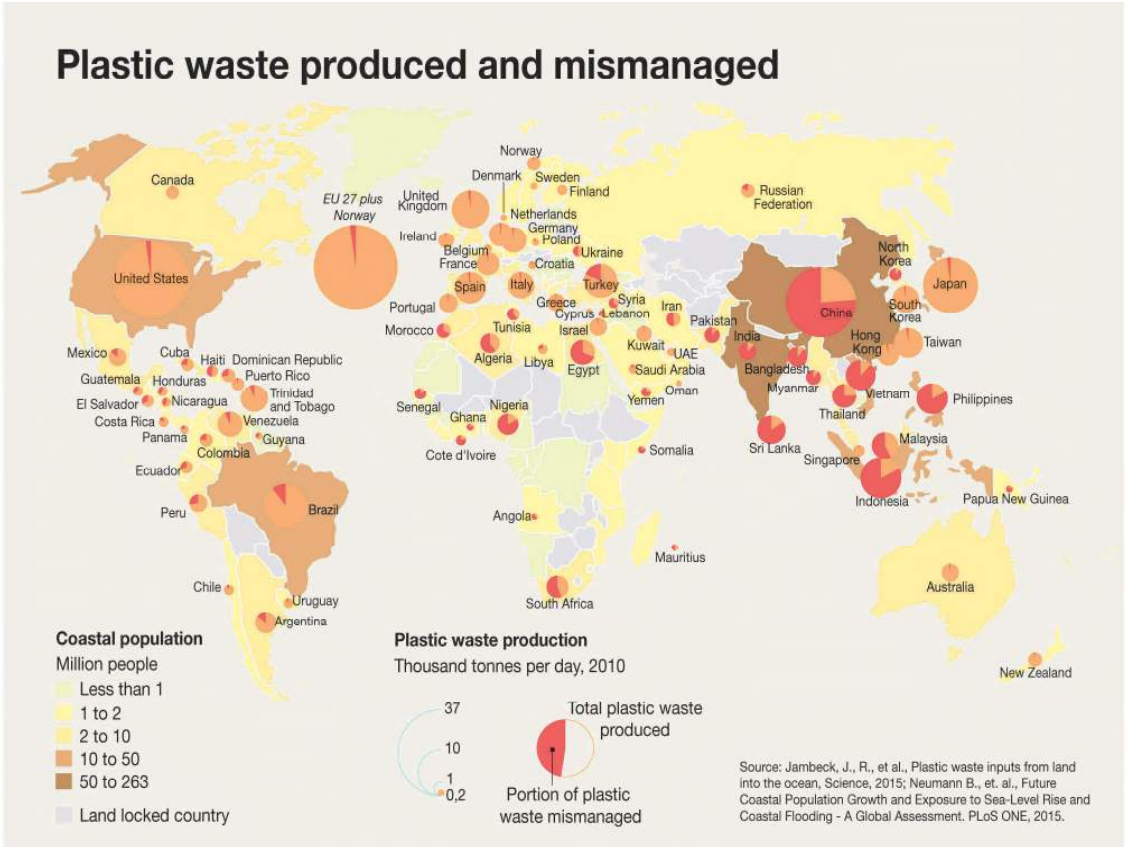


Grida.no

Indonesia Marine Plastic Baseline models

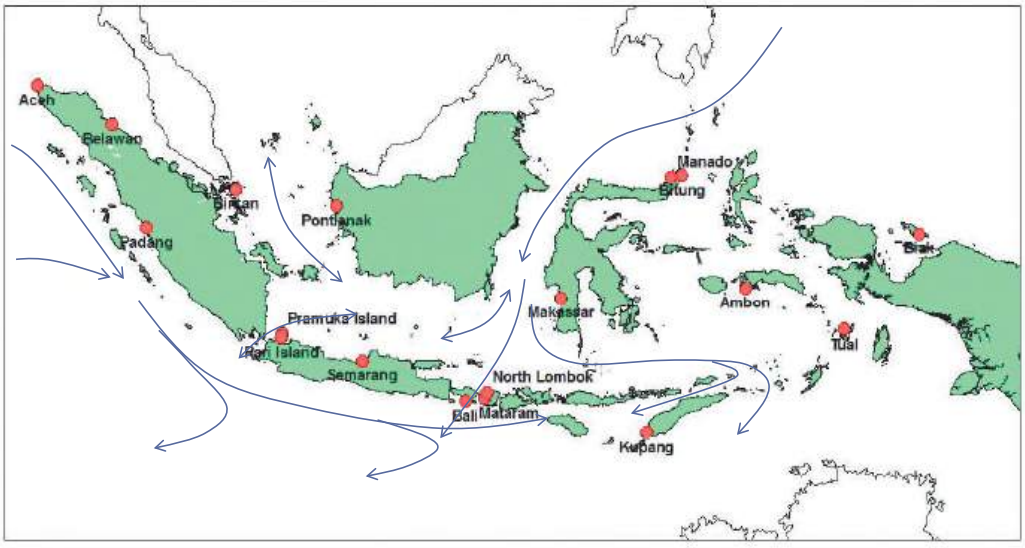
0.48 - 1.29 Mil./year
(Jambeck, 2015)

NPAP
WB
KLHK

0.27-0.59 Mil./year
(LIPI*)

*Announced offcially in Dec. 2019

Monitoring of Stranded Plastic Debris in Beaches?



0.27-0.59 Mil./year

-70%

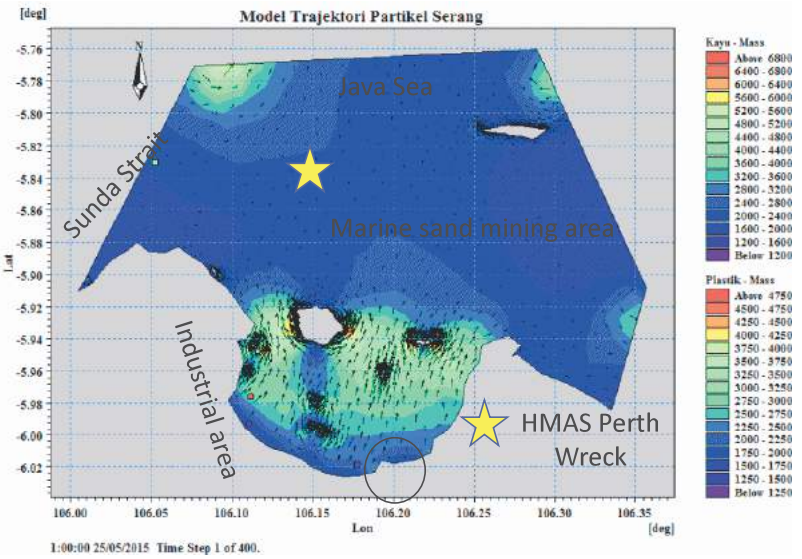
0.08 - 0.18 Mil./year

2025

Some Examples: Marine Litters Monitoring

1. Marine litters in Banten (industrial area)
2. Marine litters in Bali (touristic area)
3. Marine Litters in Small Islands

1. Marine Litters in Banten Bay (Industrial)

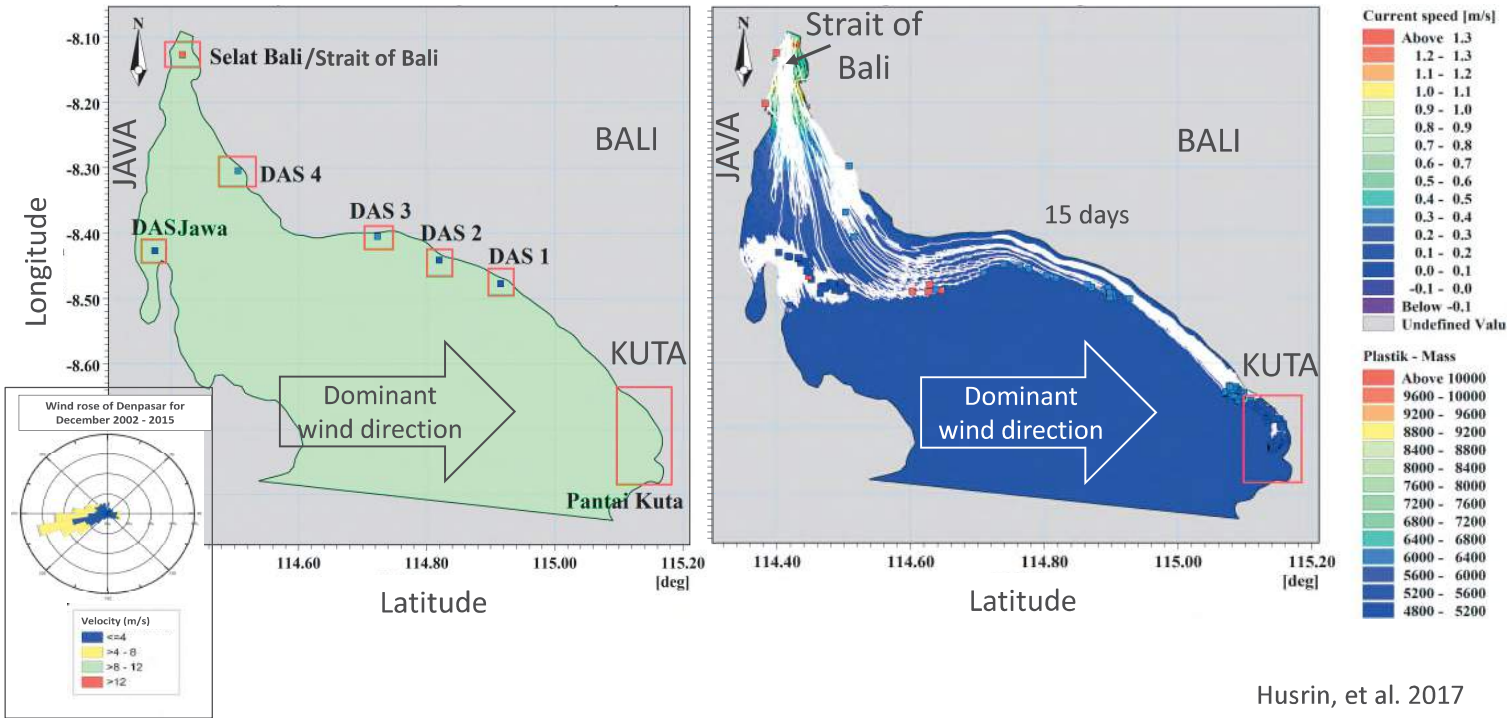


Litters accumulated during west monsoon and the following transitional seasons. During east monsoon and the following transitional seasons, marine litters were transported out of the bay

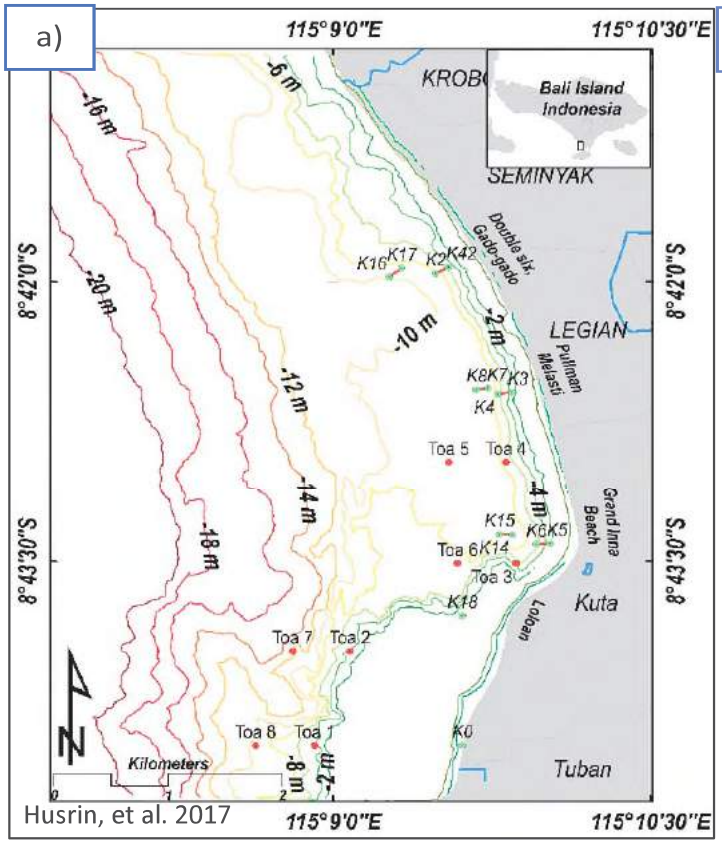
2. Marine Litters in Bali (Touristic area)

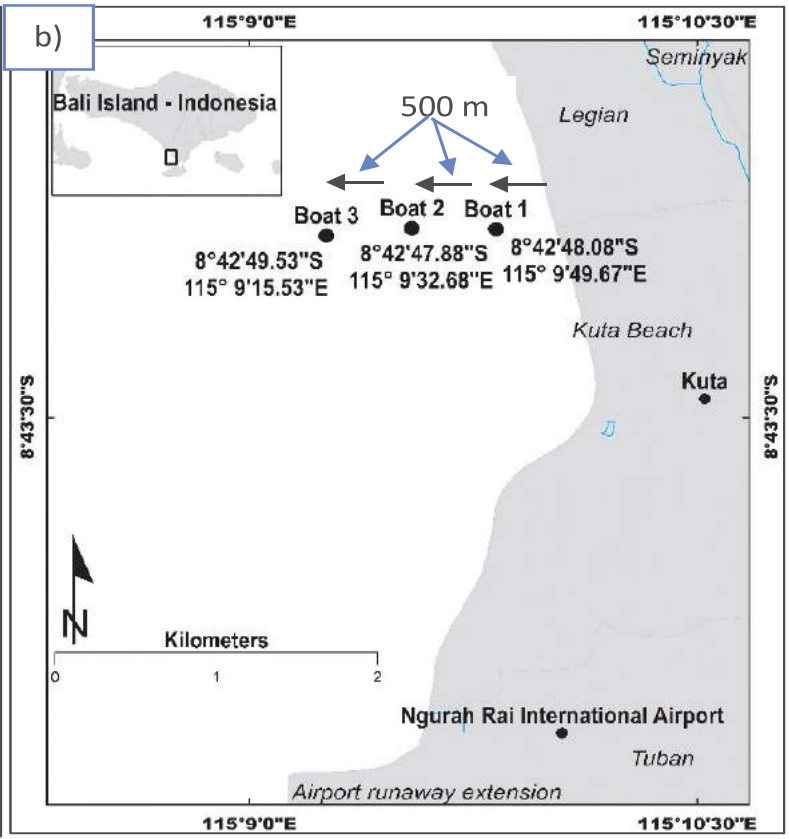
Husrin, et al. 2017

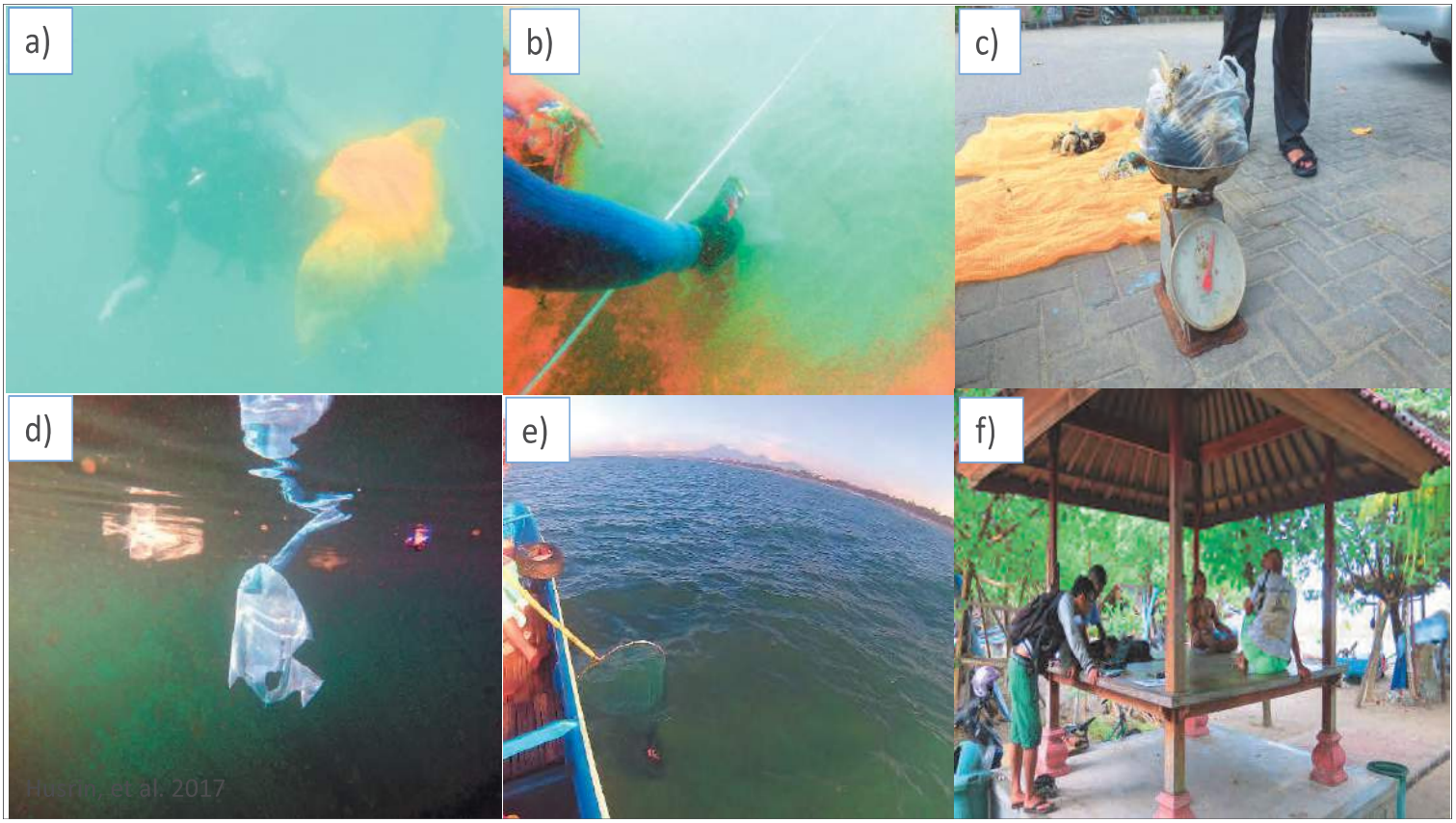
Modeling of Litter Transport and Distribution



Husrin, et al. 2017


a)
115°9'0"E
115°10'30"E
8°42'0"S
8°43'30"S
Bali Island
Indonesia
SEMINYAK
LEGIAN
Kuta
Tuban
Lokan
Grand Inna Beach
Double six
Gado-gado
Pullman
Melasti
-6 m
-16 m
-20 m
-10 m
-12 m
-14 m
-18 m
-2 m
-4 m
-8 m
K16
K17
K2
K42
K8
K7
K3
K4
K15
K6
K5
K14
K18
K0
Toa 5
Toa 4
Toa 6
Toa 3
Toa 7
Toa 2
Toa 8
Toa 1
Kilometers
Husrin, et al. 2017


b)
115°9'0"E
115°10'30"E
8°43'30"S
Bali Island - Indonesia
500 m
Seminyak
Legian
Boat 3
Boat 2
Boat 1
8°42'49.53"S
115° 9'15.53"E
8°42'47.88"S
115° 9'32.68"E
8°42'48.08"S
115° 9'49.67"E
Kuta Beach
Kuta
Kilometers
0
1
2
Ngurah Rai International Airport
Tuban
Airport runaway extension


a)
b)
c)
d)
e)
f)
Husrin, et al. 2017

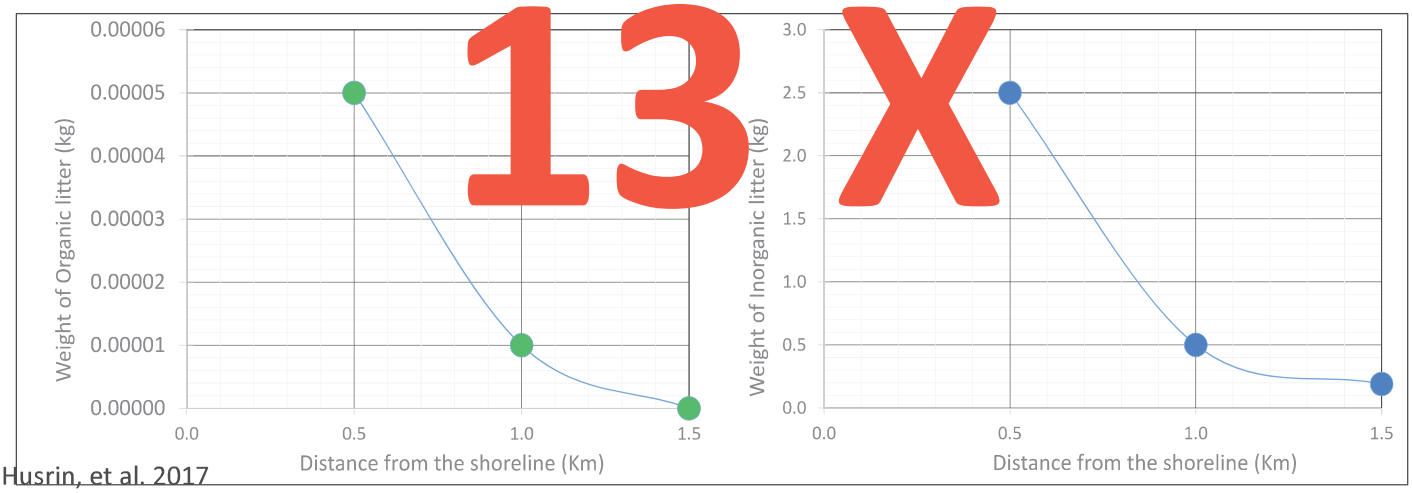
No	Name of the area	Location points				Environment		Litters identification				No	Name of the area	Location points				Environment		Litter identifications			
		P1	Lat/long	P2	Lat/long	sea condition	Tides	Code	Description	Amount	Weight (Kg)			P1	Lat/long	P2	Lat/long	sea condition	Tides	Code	Description	Amount	Weight (Kg)
1	Central Legian	K42	08°.41.11 115°.09.5	K2	08°.41.95 115°.09.4	Calm/Cloudy	ebb	*R15*	*Plastics*	*5*	*0.05*	1	Legian Tengah	K42	08°.41.119" 115°.09.546"	K2	08°.41.954" 115°.09.458"	calm/cloudy	Ebb	*R15*	*Plastics*	*8*	*0.1*
2	South Legian	K3	08°.42.59 115°.09.8	K4	08°.42.60 115°.09.7	calm/sunny	ebb	*R15* *R18*	*Plastics* *Sanitation*	*10* *1*	*0.15* *0.05*	2	Legian Selatan	K3	08°.42.590" 115°.09.845"	K4	08°.42.600" 115°.09.780"	calm/sunny	Ebb	*R15*	*Plastics*	*97*	*1.6*
3	Kuta Beach	K5	08°.43.40 115°.10.0	K6	08°.43.40 115°.09.9	calm/sunny	ebb	*R15* *R8*	*Plas* *pe*		*0.2* *0.05*	3		K5	08°.43.404" 115°.10.026"	K6	08°.43.408" 115°.09.960"	calm/sunny	Ebb	*R15* *R8*	*Plastics* *Pl. rope*	*143* *4*	*1.55* *0.05*
4	South Legian	K7	08°.42.56 115°.09.7	K8	08°.42.57 115°.09.6	sunny	flood	*R15* *R7*	*Plastics* *Rope*	*7*	*0.45* *0.25*	4	egian Selatan		08°.42.569" 115°.09.733"	K8	08°.42.575" 115°.09.678"	Wavy/cloudy	Ebb to flood	*R15* *R2*	*Plastics* *Bottle*	*185* *2*	*1.21* *0.2*
5	Central Legian	K14	08°.43.32 115°.09.9	K15	08°.43.35 115°.09.7	Calm	flood			*0*	*0*	5	Legian Tengah	K14	08°.43.326" 115°.09.906"	K15	08°.43.354" 115°.09.787"	Wavy/cloudy	flood	*R15*	*Plastics*	*8*	*0.1*
6	Cental Legian	K16	08°.40.97 115°.09.2	K17	08°.41.92 115°.09.3	Calm	flood			*0*	*0*	6	Legian Tengah	K16	08°.40.973" 115°.09.246"	K17	08°.41.926" 115°.09.324"	Wavy/cloudy	flood	*R15*	*Plastics*	*1*	*0.01*
Total										104	1.2	Total										448	4.82

4X

April 15th, 2015 (Transitional Season) **Feb 9th, 2016 (West Monsoon Season)**

Husrin, et al. 2017

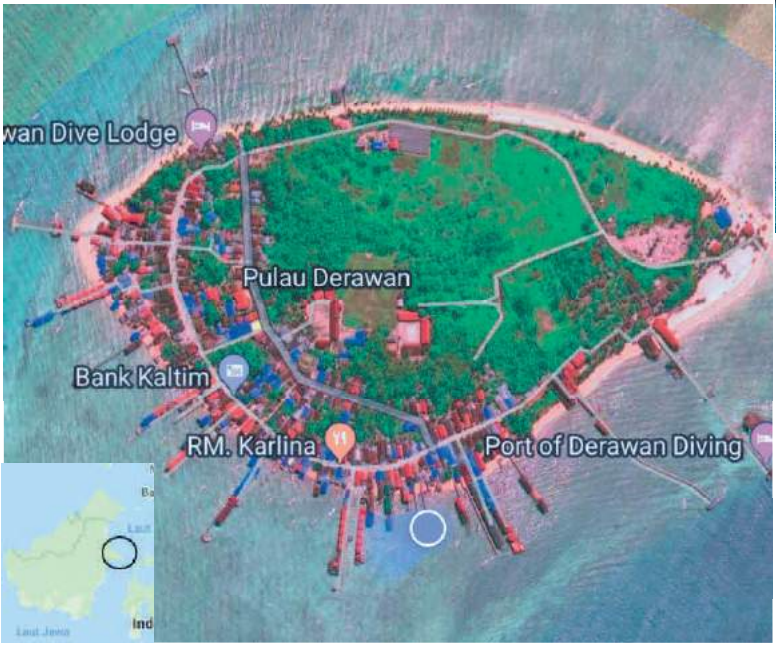
Station	Distance from the beach (km)	Weight of organic litter (kg)	Weight of Inorganic litter (kg)	Total weight of litters (kg)
1	0.5	0.00005	2.5	2.50005
2	1	0.00001	0.5	0.50001
3	1.5	0	0.19	0.19



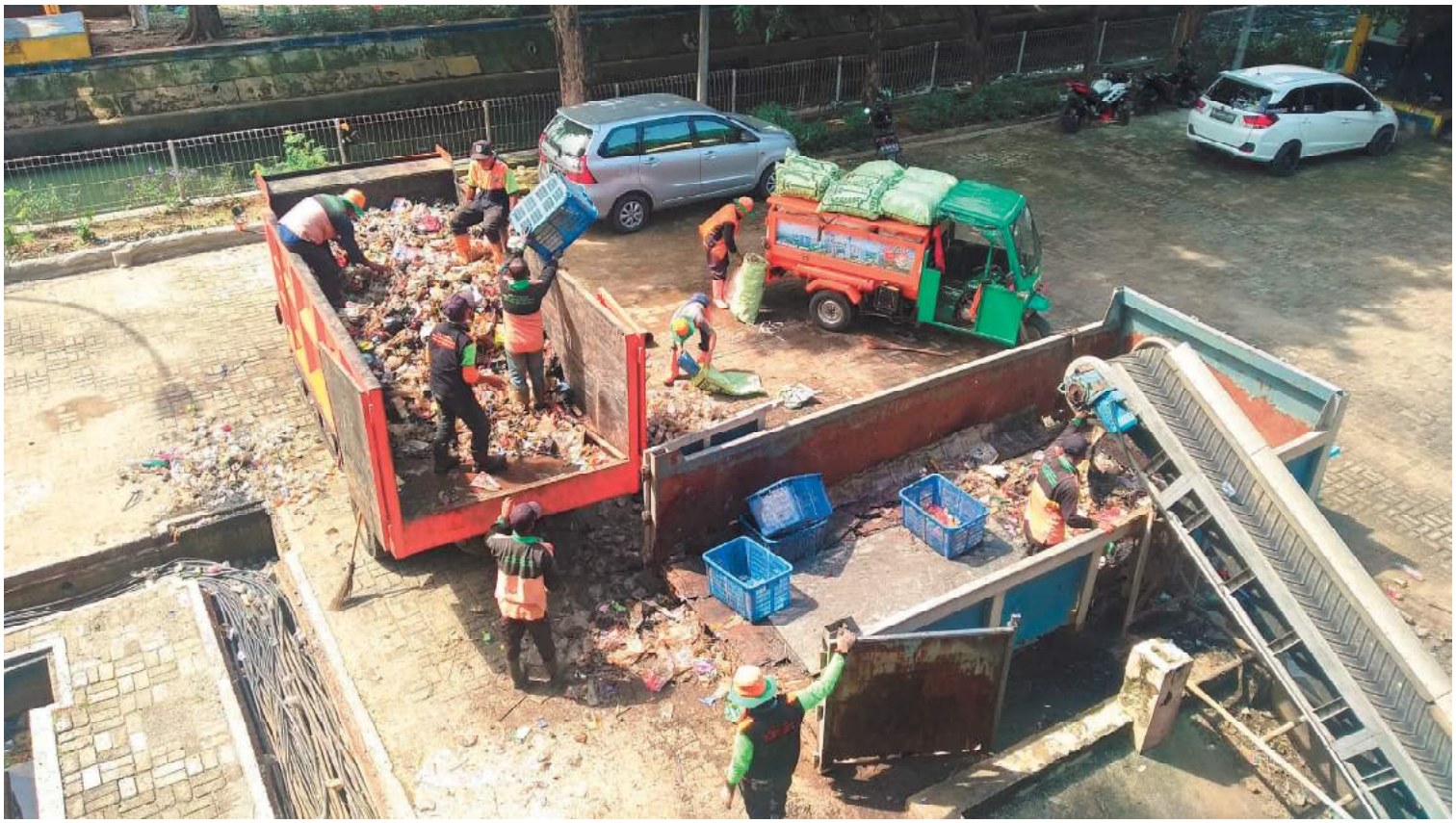
Husrin, et al. 2017

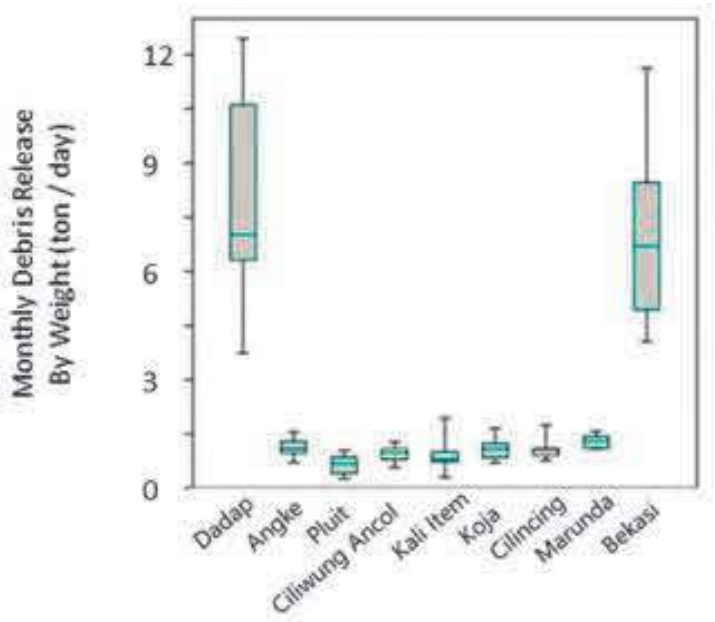

Yeh Hyaa

3. Marine Litters in (Very) Small Islands



A simple technology





Cordova & Nurhati, 2019

Conclusion & Remarks

- ✓All stake holders should be involved (PPres.83/2018)
- ✓Baselines provide tools for actions towards -70% by 2025
- ✓Beaches vs rivermouths monitoring
- ✓Collection of plastics using technology
- ✓Long term marine plastic reduction → behavioral change → early childhood education

TERIMAKASIH

Pusat Riset Kelautan

Badan Riset dan Sumber Daya Manusia Kelautan & Perikanan

Kementerian Kelautan & Perikanan Republik Indonesia

www.pusriskel.litbang.kkp.go.id