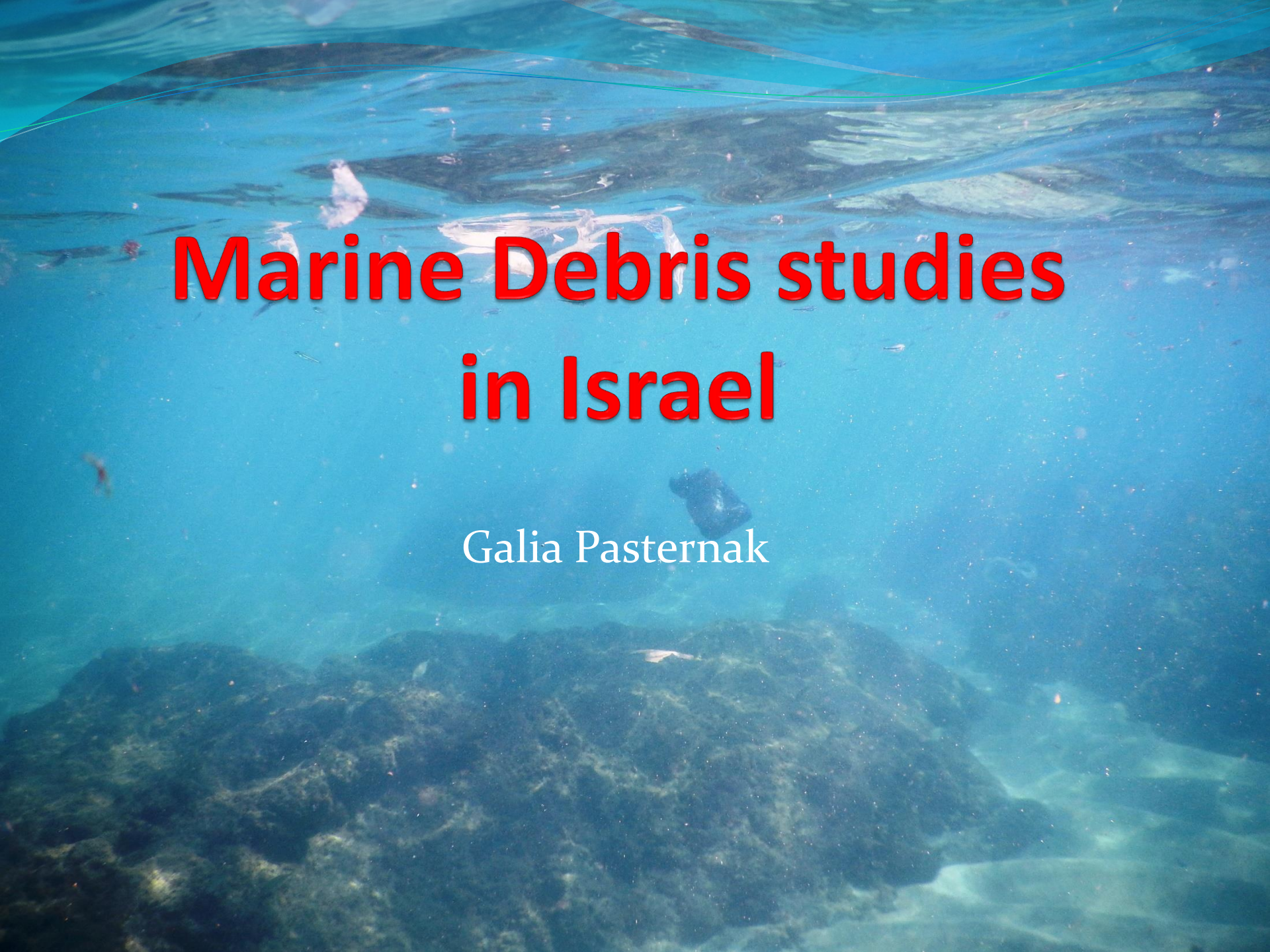

Marine Debris studies in Israel

Galia Pasternak

Past studies in Israel

- Golik, A., Gertner, Y. (1992):

  Litter in the Israeli coastline.

- Bowman, D., Manor-Samsonov, N., Golik, A. (1998):

  Dynamics of Litter Pollution on Israeli Mediterranean Beaches: A Budgetary, Litter Flux Approach.

- Alkalay, R., Pasternak, G., Zask, A. (2007):

  Clean-Coast Index - A new approach for beach cleanliness assessment.

Marine Debris on the Mediterranean Coast of Israel:

types, origin, distribution and transport

Galia Pasternak[a]

Prof. Ehud Spanier[a,b], Dr. Dov Zviely[b,c], Dr. Christine A. Ribic[d]

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המשרד להגנת הסביבה
היחידה הארצית להגנת הסביבה הימית
ISRAEL
MARINE ENVIRONMENT PROTECTION DIVISION

אוניברסיטת חיפה
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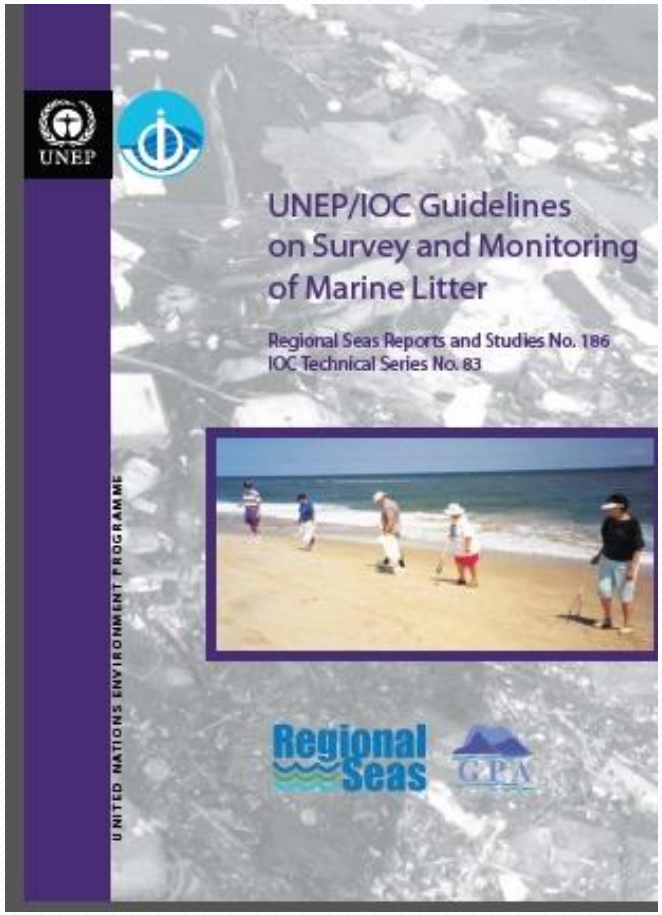
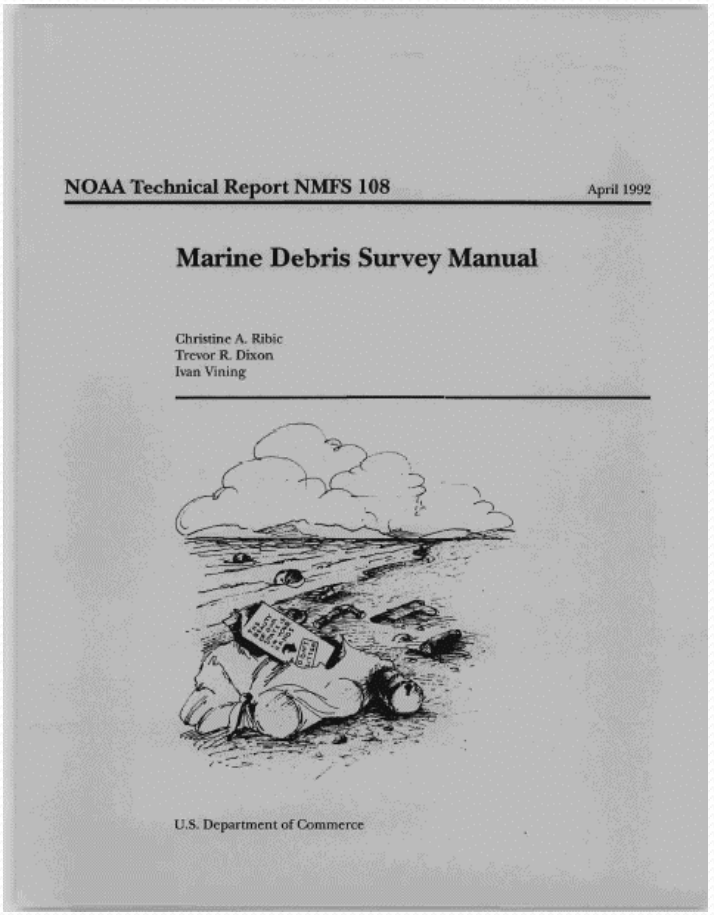
Methods


UNEP
UNEP/IOC Guidelines
on Survey and Monitoring
of Marine Litter
Regional Seas Reports and Studies No. 186
IOC Technical Series No. 83
UNITED NATIONS ENVIRONMENT PROGRAMME
Regional Seas
GPA


NOAA Technical Report NMFS 108
April 1992
Marine Debris Survey Manual
Christine A. Ribic
Trevor R. Dixon
Ivan Vining
U.S. Department of Commerce

Coastal Surveys
Summer 2012 – Autumn 2018

- A total of 30 surveys on sandy beaches
- 12.1 items per 100 m^2 (less than the world average)
- 90% of the items were plastic
- 35% Single-used plastic
- Geographical differences
- Beach use affect on marine debris

Floating marine debris
Summer 2013 - Spring 2015

- 8 cruises to 17 sites with Ecoocean's R/V Mediterranean Explorer
- 15 minutes observations and counting of floating MD, while towing Manta net for microplastic collection.

- Between 0-2341 items per km^2 (Average 228)
- 96% plastic

Benthic Observation

- 32 coastal dives from the waterline into the sea

- 37 open-sea dives at 10m depth with Ecoocean's Mediterranean Explorer parallel to the shoreline.
- Sediment was collected for microplastic.

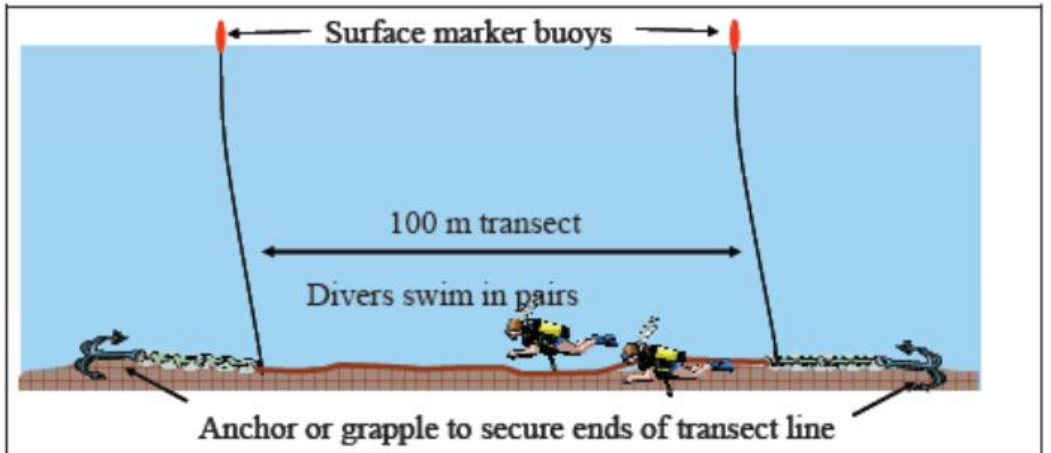


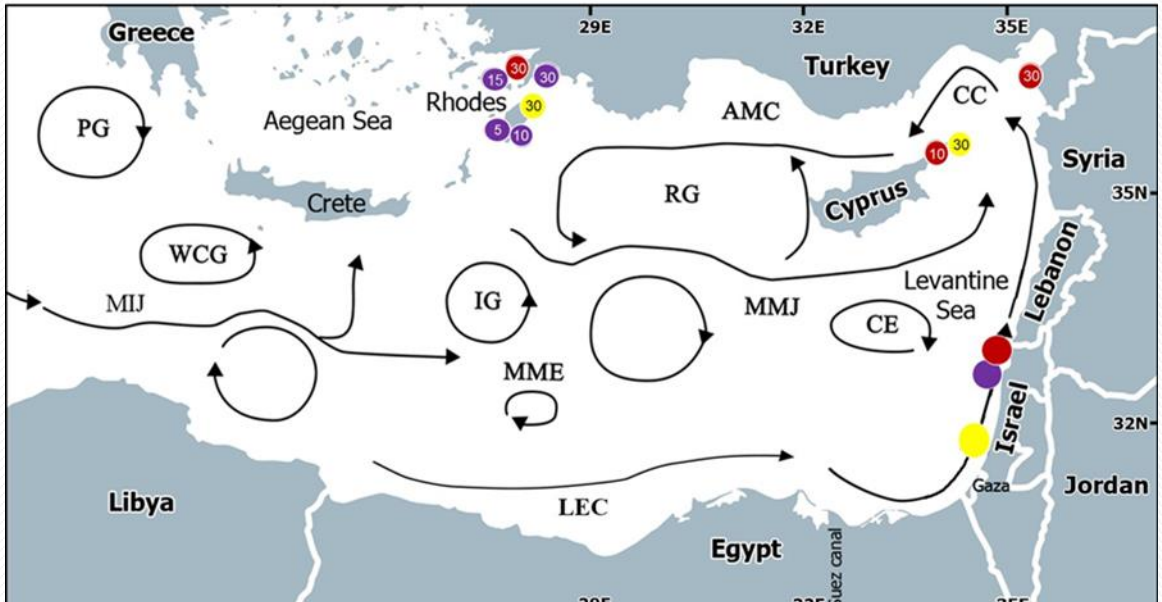
Figure 9. Layout for benthic visual litter survey; divers swim down the transect line and collect or record all litter items found within 2 m on both sides of the line. Litter is then recorded in terms of either the count of items or the weight per unit of length (e.g. kg / km).

Citizen Science

- Since May 2015, 33 major underwater clean up events were accompanied by a researcher, and all the collected marine debris was weighted and sorted.
- In December 2015, the divers' volunteer program "Mishmar Hayam" (Sea Guard), started.
- 18 surveys in seven Near-shore rocky bottom sites (1-6 in each site).

Message in a Bottle

- Currents' effect on transportation of plastic waste, was studied by discarding 300 plastic bottles near 6 sites along the Israeli coast.
- Southern bottles were found on the coast while northern bottles were found in northern countries.



Microplastics in Israeli Mediterranean Coastal Waters:

Distribution, Abundance, Ingestion by Local Fish and Possible Ecological Effects

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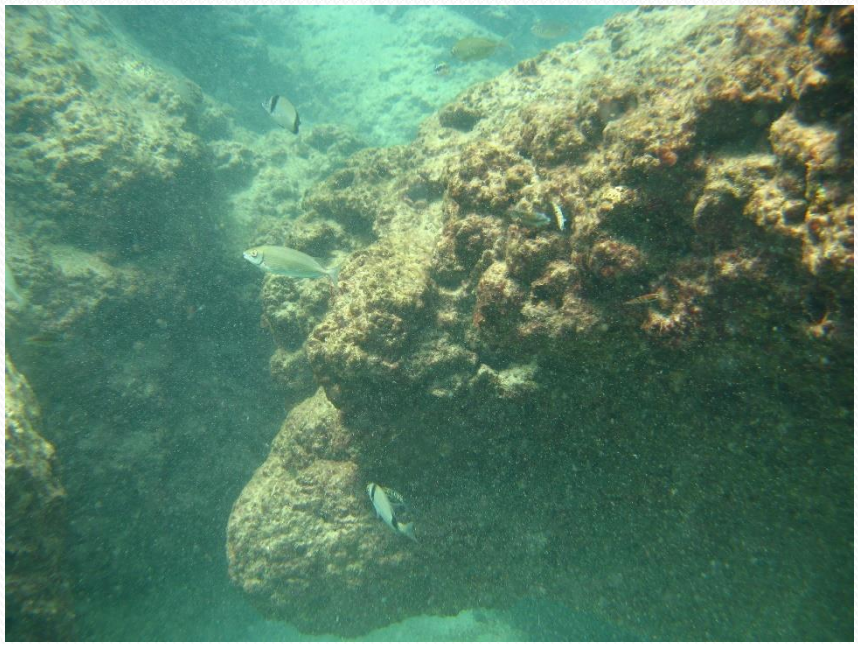
Floating and benthic microplastic Summer 2013 - Spring 2015

- Surface water microplastics abundance of 7.68 ±2.38 particles/m^3 considerably higher than the other Mediterranean regions.
- Plastic fragments were the most common form.
- Microplastic in the sediments at 10 m depth were relative low (0.014 particles/cm^3 or 1.94 particles/kg), whereas the abundance of MPs in a sublittoral sample (115 m depth) showed a high abundance of MPs in that area (with 355 particles/kg).

- Persistent organic pollutants (POPs) were found present in Microplastic particles, in some cases higher in 3 orders of magnitude than of concentrations in the water column.

Microplastic in fish

- Several local fish species were found to consume MP particles.
- One group in particular, the rabbitfish, Siganus rivulatus and S. luridus, are noteworthy because of the large abundance of plastic particles found in their digestive tracts (average: 60 particles/fish; range: 0-458 particles/fish).



Marine debris data in Israel

- Pasternak, G., Zviely, D., Ribic., C.A. Ariel, A., Spanier, E., 2017.

Sources, composition and spatial distribution of marine debris along the Mediterranean coast of Israel. *Marine Pollution Bulletin 114(2):1036-1045.*

- Van der Hal, N., Ariel, A., Angel, D. L., 2017. **Exceptionally high abundances of microplastics in the oligotrophic Israeli Mediterranean coastal waters.** *Marine Pollution Bulletin 116(1-2):151-155.*
- Pasternak, G., Zviely, D., Ariel, A., Spanier, E., Ribic, C. A., 2018.

Message in a Bottle - the story of floating plastic in the eastern Mediterranean Sea. *Waste Management* 77: 67-77.

We Are Doing it for Them!

Thank You!

Wish you Peace