Harmonising methods for monitoring and assessment of marine plastics and microplastics*

Peter Kershaw¹, Alexander Turra² & Francois Galgani³

S2 - PICES Vladivostok, September 2017

¹GESAMP, ²Univ. Sao Paulo Brazil, ³IFREMER France

*GESAMP Working Group 40 – Sources, fate & effects of plastics & microplastics in the marine environment

Microplastic debris, Hong Kong, post-typhoon
GESAMP  The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection

An inter-agency body of the United Nations established in 1969

Purpose: ‘to provide authoritative, independent, interdisciplinary scientific advice to organizations and governments to support the protection and sustainable use of the marine environment.’
How GESAMP functions

GESAMP Members*  
10 - 16 independent experts

GESAMP Office  
Executive Committee

Nine UN Sponsoring Agencies

Working groups  
Task teams  
Advice to UN  
Ad hoc activities

Partners
Regional Seas Industry  
Science bodies  
Conventions  
NGOs  
Governments  
Foundations

Independent experts

* Membership (February 2017): Australia, Italy, India, Germany, Mexico, Netherlands, Nigeria, UK, USA
GESAMP working groups:

WG 1 – hazard evaluation of harmful substances carried by ships – IMO (self-funded)

WG 34 – review of applications for ‘active substances’ in ballast water management systems – IMO (self-funded)

WG 38 – atmospheric inputs of chemicals to the ocean - WMO

WG 39 – global trends of pollution of coastal ecosystems – IAEA

WG 40 – sources, fate & effects of plastics & microplastics – IOC, UN Environment

WG 41 – marine geo-engineering – IMO, IOC

WG 42 – impacts of mine tailings - IMO
WG40: a short history
Policy-relevant recommendations

‘ .......... in order to address problems related to marine litter in the most efficient and effective way, it is recommended that States:

(h) Develop cost-effective monitoring and assessment strategies with regard to marine litter at all levels, taking into account existing programmes,

i) Promote harmonization and standardization of methods (e.g., protocols, sampling) for marine litter, including for assessment and monitoring of marine litter contamination; ........’
WG40 3rd Phase - Revised Terms of Reference:

2017 onwards

1. To develop guidelines covering terminology and methodologies for the sampling and analysis of marine macro-plastics and microplastics

2. To assess the occurrence and effects of nano-sized plastics on marine organisms, and make research and policy-relevant recommendations *

3. To assess the significance of plastics and microplastics as a vector for indigenous and non-indigenous organisms, and make research and policy-relevant recommendations *

* To be reviewed in 2018
1. To develop guidelines covering terminology and methodologies for the sampling and analysis of marine macro-plastics and microplastics

2. To assess the occurrence and effects of nano-sized plastics on marine organisms, and make research and policy-relevant recommendations.

3. To assess the significance of plastics and microplastics as a vector for indigenous and non-indigenous organisms, and make research and policy-relevant recommendations.
WG40 objectives 2017 – 2018:

1. To develop guidelines covering terminology and methodologies for the sampling and analysis of marine macro-plastics and microplastics
   
   a) size and shape definitions of particles
   b) sampling protocols for the whole spectrum of particle/object sizes in surface and sub-surface seawater, seabed sediments, shorelines and biota
   c) methodologies for physical and chemical identification and analysis of polymers and associated chemicals
   d) requirements for monitoring and assessment
WG40: 3rd Phase Institutional Support, ToR 1:

Lead Agencies: UN Environment & IOC-UNESCO

• IMO (residual industry funding)
• NOAA, USA (Marine Debris Program)
• Ministry of Environment, Japan (G7 Marine Litter Action Plan)
• State Ocean Administration, China (G20 Marine Litter Action Plan)
• North West Pacific Action Plan (NOWPAP) (G7 – Regional Seas collaboration)
• BASEMAN – JPI Oceans\(^a\) project (microplastics methods)

\(^a\) Consortium of European countries to support ocean research
<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Country</th>
<th>Sponsor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexander Turra</td>
<td>Co-Chair macro-plastics</td>
<td>Brazil</td>
<td>UN Env.</td>
</tr>
<tr>
<td>Peter Ryan</td>
<td></td>
<td>South Africa</td>
<td>UN Env.</td>
</tr>
<tr>
<td>Markus Erikson</td>
<td></td>
<td>USA</td>
<td>UN Env.</td>
</tr>
<tr>
<td>Akbar Tahir</td>
<td></td>
<td>Indonesia</td>
<td>UN Env.</td>
</tr>
<tr>
<td>Martin Thiel</td>
<td></td>
<td>Chile</td>
<td>UN Env.</td>
</tr>
<tr>
<td>Chris Wilcox /Denise Hardesty</td>
<td></td>
<td>Australia</td>
<td>IOC-UNESCO</td>
</tr>
<tr>
<td>Peter Kershaw</td>
<td>Chair</td>
<td>UK</td>
<td>IMO</td>
</tr>
<tr>
<td>Francois Galgani</td>
<td>Co-Chair microplastics</td>
<td>France</td>
<td>IMO</td>
</tr>
<tr>
<td>Amy Lusher</td>
<td></td>
<td>Norway</td>
<td>IMO</td>
</tr>
<tr>
<td>Chelsea Rochman</td>
<td></td>
<td>Canada</td>
<td>IMO</td>
</tr>
<tr>
<td>Sheri Mason</td>
<td></td>
<td>USA</td>
<td>NOAA</td>
</tr>
<tr>
<td>Martin Hassellov</td>
<td></td>
<td>Sweden</td>
<td>BASEMAN</td>
</tr>
<tr>
<td>Sang Hee Hong</td>
<td></td>
<td>Korea</td>
<td>NOWPAP</td>
</tr>
<tr>
<td>Hideshige Takada</td>
<td></td>
<td>Japan</td>
<td>Gov. Japan</td>
</tr>
<tr>
<td>Weiwei Zhang</td>
<td></td>
<td>China</td>
<td>SOA</td>
</tr>
<tr>
<td>Amy Uhrin</td>
<td>Observer</td>
<td>USA</td>
<td>NOAA</td>
</tr>
<tr>
<td>Ulrike Kammann</td>
<td>Observer</td>
<td>Germany</td>
<td>Inst. Fish. Ecol.</td>
</tr>
</tbody>
</table>
WG40 work programme 2017 – 2018:

• Workshop: 11-14 September 2017, Paris, IOC-UNESCO
• Mini-workshop & evening side event: 14 & 17 March 2018, San Diego, 6th Int. Marine Debris Conf. (6IMDC)
• Workshop: June 2018, Bangkok
• Draft report: 31 August 2018
• Review: September 2018
• Publication: December 2018
Executive summary

1. Purpose
2. Background and objectives
3. Definitions
4. Basic principles of monitoring and assessment
5. Monitoring methods for shorelines
6. Monitoring methods for ocean surface
7. Monitoring methods for water column
8. Monitoring methods for seafloor
9. Monitoring methods for biota
10. Additional monitoring strategies for biota/plastics interactions
11. Selection of analytical methods for physical, chemical and biological characterization
12. Harmonised assessment & monitoring of marine plastics and microplastics
13. Conclusions

References & Annexes
Intended users of guidelines for harmonised methods:

- UN sponsoring agencies
- Other sponsoring organisations
- Intergovernmental Organisations/Conventions
- Regional Seas organisations (RS Marine Litter Action Plans)
- Countries of the G20 group (G20 Marine Litter Action Plan)
- Countries of the G7 group (G7 Marine Litter Action Plan)
- Other countries (e.g. Norway, Sweden .......
- Private & public sector organisations
- Civil society/citizen science
- NGOs
- Academia
Thank You!

peter@pjkershaw.com

theOffice@gesamp.org

www.gesamp.org