

Technological maturity of monitoring methods (Evaluated in March 2025)

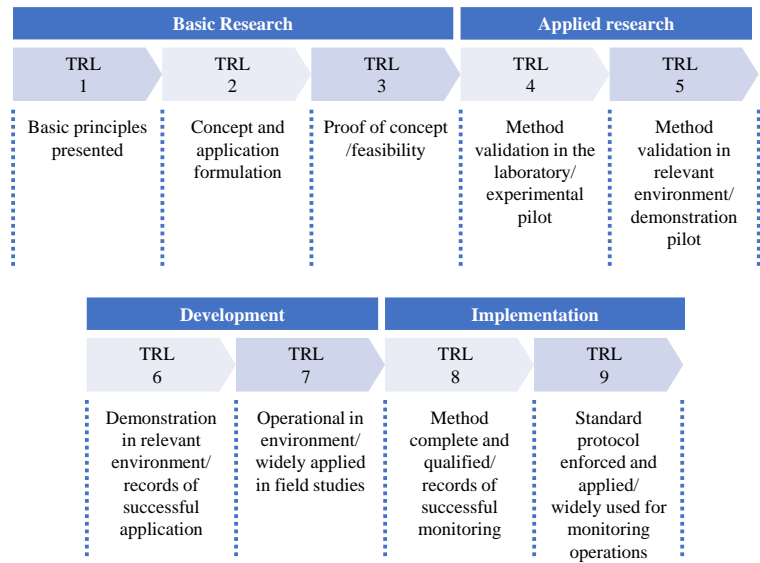


Figure. Description of the technological readiness level (TRL) scale on remote sensing technologies used in litter monitoring* (Aliani et al. 2023)

* Aliani S. et al. (2023) Reproducible pipelines and readiness levels in plastic monitoring. Nat Rev Earth Environ 4(5), 290-291.

Table 1. TRL of UAV, stationary camera, and aircraft used in litter monitoring

Tasks	UAV	Stationary Camera	Aircraft
Beach, riverbank/lake beach/land	8	8	7
Sea surface	6	N/A (Not applicable)	5
Estuary surface	6	N/A	5
River surface	6	8	N/A

Notes:

- TRLs were assessed based on the existing marine litter surveys and research in Kako et al. (2024) and other confirmed cases listed in the references. Although the TRL values are for cases where objects (litter) being measured are clearly visible and there are no obstacles to the installation or operation of the measuring equipment, it should be noted that the technical maturity may differ depending on the environment, such as plant growth or snowfall.
- It should be noted that research in this field has been accelerating in recent years, and the maturity of the methods may change in the future.

Table 2. TRL of satellite used in litter monitoring

Tasks	Current TRL for (Floating/Stranded on Land) Mixed Non Vegetation Matter	Current and (Potential TRL for Marine Plastic Litter in Medium Term -5 Years)
Beach, riverbank/lake beach/land	6	6 (9)
Sea surface	6	2 (7)
Estuary	2	2 (3)
River surface	2	3 (3)

Notes:

- Although the TRL values are for cases where objects (litter) being measured are clearly visible and there are no obstacles to the installation or operation of the measuring equipment, it should be noted that the technical maturity may differ depending on the environment, such as plant growth or snowfall.
- It should be noted that research in this field has been accelerating in recent years, and the maturity of the methods may change in the future.