

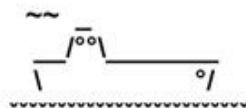


# Sample analysis procedures or techniques used to test for compliance with D-1

><(((°>  
GoConsult

Stephan Gollasch  
GoConsult, Hamburg, Germany  
and

**David Consult**



Matej David  
Dr. Matej David Consult d.o.o.  
Korte, Slovenia

# Outline

- Sampling purpose
- D-1 standard
- Possible methods for compliance checks

# Sampling Purpose

- Compliance with D-1  
(Ballast Water Exchange (BWE))
  - 200 m depth, 200 nm from nearest land
  - 200 m depth, 50 nm from nearest land
  - Designated areas

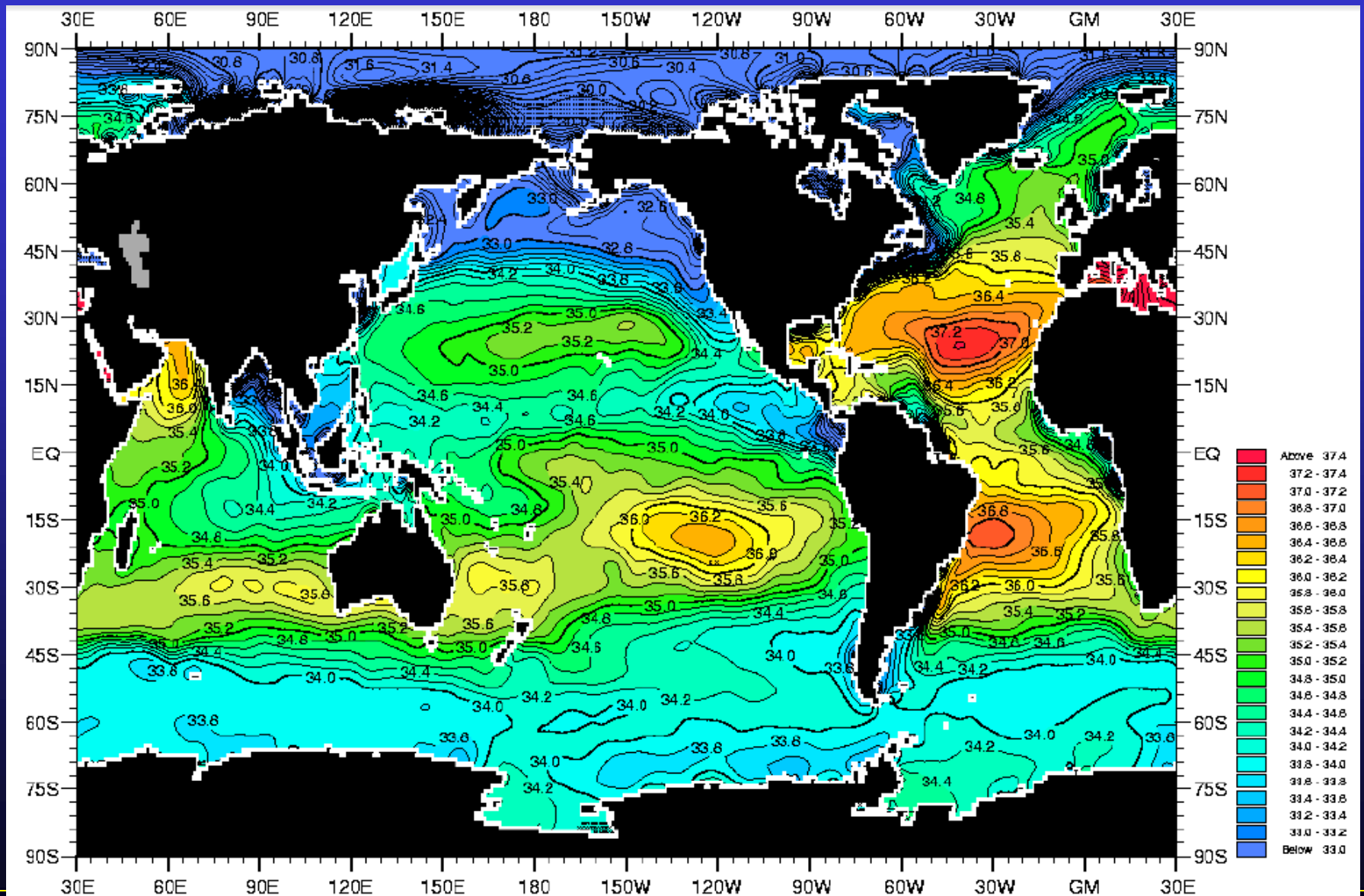


# D-1 (Ballast Water Exchange)

- Tracers of human activity
  - Presence of e.g. Nitrogen or Phosphorous may indicate nearshore BWE (river run-off in urban areas), colored dissolved organic matter (CDOM)
- Coastal species
  - Harpacticoid copepods, barnacles
- Sediment
- High sediment load may indicate near-shore BWE, but re-suspension from tank bottom occurs
- Salinity
  - If salinity is below 30 psu it is unlikely that it was exchanged at sea



# D-1 (Ballast Water Exchange)



# Tools for D-1 Compliance Checks

- Conductivity sensor
  - easy to calibrate (with freshwater)
  - portable
  - dip-stick method



- Refractometer
  - easy to calibrate (with freshwater)
  - portable (pocket-size)
  - a few drops of water are sufficient



# Conclusions

- Methods exist to proof D-1 compliance
  - We recommend to measure water salinity, but
    - BWE in coastal/port areas in high-salinity environments (above 30 psu) will results in compliance but water does not originate from mid-ocean (non-compliance with D-1); or
    - BWE in designated ballast water exchange areas (within 50 nm from nearest land) may result of less salinity than the mid-ocean water. Here the BWE would be compliant, but salinity measurements alone would show non-compliance
  - Origin of BWE must be known
-

# Contacts

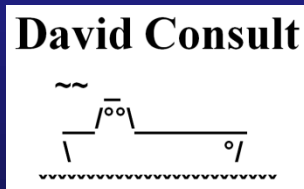


Stephan Gollasch

GoConsult, Hamburg, Germany

[sgollasch@aol.com](mailto:sgollasch@aol.com)

[www.gollaschconsulting.de](http://www.gollaschconsulting.de)



Matej David

Dr. Matej David Consult d.o.o.

Korte, Slovenia

[matej.david@siol.net](mailto:matej.david@siol.net)

[www.davidconsult.eu](http://www.davidconsult.eu)



A night scene featuring a large, textured, cylindrical structure on the left. A bright, conical beam of light emanates from the base of this structure, illuminating the ground. In the background, a series of small, warm lights are visible, possibly from a building or a distant street. On the right side of the image, a portion of a red and white triangular sign is visible, featuring a black silhouette of a person. The overall atmosphere is dark and mysterious.

**Thank you very much  
for your attention**