

Joint SCOR/IAPWS/IAPSO Committee on the Properties of Seawater (JCS)

Report to SCOR and IAPSO on JCS Activities June 2017-Aug 2018

Membership

Executive

Rich Pawlowicz (Chair)	Canada
Rainer Feistel (Vice-chair)	Germany
Trevor J. McDougall (Vice-chair)	Australia

Salinity/Density Subgroup

Frank J. Millero	USA
(Rich Pawlowicz)	Canada
Steffen Seitz	Germany
Hiroshi Uchida	Japan
Stefan Weinreben	Germany
Youngchao Pang	China
Henning Wolf(1)	Germany

pH Subgroup

Maria Filomena Camoes	Portugal
Andrew Dickson	USA
Daniela Stoica	France

Relative Humidity Subgroup

Olaf Hellmuth	Germany
Jeremy Lovell-Smith	New Zealand

Thermodynamics

(Rainer Feistel)

Numerical Modelling and Applications

(Trevor J. McDougall)

Software

Paul Barker	Australia
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Industry Representatives

Richard Williams (OSIL)	UK
Barbara Laky (Anton Paar)	Austria

(1) HW retired July/2018

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Meetings

JCS did not meet as a full group in 2017-18. However, 6 JCS members did attend the 2017 IAPWS Annual Meeting in Kyoto, Japan (Sept 2-7, 2017), and 3 members attended the 2018 Ocean Sciences meeting (Portland, Feb 1, 2016).

Web site

JCS maintains a web site at www.teos-10.org. This site gets 1600-2300 visitors per month (8574 in the past year, with 64304 “unique views” since Oct 2010). Annual downloads have stabilized below their peak.

Web site Item	Unique downloads June 2011- June 2013	Unique downloads June 2013- June 2014	Unique downloads June 2014- June 2015	Unique downloads June 2015- June 2016	Unique downloads June 2016- June 2017	Unique downloads June 2017- June 2018
Manual	920	360	535	552	418	427
Getting Started	879	362	558	547	427	475
Slides	704	284	374	318	219	248
Primer	584	197	289	297	222	217
GSW MATLAB_v3_0	1920	1102	1485	1814	1235	1552
GSW FORTRAN_v3_	366	222	171	162	127	116
GSW_C_v3_0	202	84	133	151	85	96
GSW_PHP	-	55	61	43	29	60
SIA_VB	72	100	46	45	45	48
SIA_FORTRAN	59	118	58	44	36	42

Other Progress

1. SS (and others) have established a metrology network “Climate and Ocean Observation” within EURAMET.
2. SS is working towards making high-pressure measurements of conductivity traceable to the SI.

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3. The 4 Metrologia review papers published in January 2016 and widely read thereafter have had their effect; downloads traffic in 2018 has been low.
4. RF and JLS continue working towards procedures for making systematic error estimates.
5. OH has incorporated TEOS-10 into work on cloud microphysics modelling
6. TEOS-10 is now the equation of state in the two main community climate ocean models (MOM6 and NEMO). It is also optional in two other widely used models (MITgcm and ROMS).
7. HU has carried out density anomaly measurements in the Bering Sea and Gulf of Alaska (2017), HU/FJM are carrying out an interlaboratory comparison with measurements in the Arabian Sea (May/June 2018).
8. AD continues to provide Tris buffer for seawater pH, also (with WG-145) involved with more Harned Cell data and calibration of spectrophotometric pH methods over a salinity range of 5 to 20, bridging fresh and seawater regimes.
9. FJM/RP continue analysis of East Pacific Rise density anomaly data.
10. RP is working on understanding the diffusion of seawater and possible fractionations that result from this.

Papers published

1. H. Schmidt, S. Seitz, E. Hassel, H. Wolf, The density-salinity relation of standard seawater, *Ocean Sci.*, 14, 15-40, (2018), doi: 10.5194/os-14-15-2018
2. Y. Li, Y. Kang, H. Yu, Y. Pang, Linearity corrections for laboratory salinometer measurements: IAPSO Standard Seawater linearity pack vs. weight diluted samples, *Deep Sea Res I*, 137, 13-19 (2018) doi.org/10.1016/j.dsr.2018.04.011
3. R. Feistel, Thermodynamic properties of seawater, ice and humid airL TEOS-10, before and beyond, *Ocean Sci.*, 14, 471-502 (2018) doi.org/10.5194/os-14-471-2018 [*Invited paper by winner of EGU Fridtjof Nansen Medal 2018*]
4. Bárbara Anes, Ricardo J.N. Bettencourt da Silva, Cristina Oliveira, M. Filomena Camões, Uncertainty evaluation of alkalinity measurements on seawater samples, *Measurement*, Volume 129, (2018), 395-404. <https://doi.org/10.1016/j.measurement.2018.07.042>

R. Pawlowicz

JCS chair, Aug 29 2018