a joint POLMAR - GLOMAR course

Statistics - An Introduction to Parameter Estimation and Hypothesis Testing (using R)

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Date & Time:	**8 - 10 May 2019**, 10 am – 4 pm
	9 - 11 July 2019, 10 am - 4 pm (NEW DATE)
Location:	AWI Building, room E - 4025
Language:	English
Target group:	Doctoral candidates, Postdocs
POLMAR credit points:	3 per course
Registration:	info.polmar@awi.de

Objectives

Part 1: The course starts with discussion of basic concepts of statistical analysis: randomness, random sample, point estimators for mean and variance, robust point estimators, probability distributions (PDs), probability density functions (PDFs). The most commonly used significance tests
(t, ANOVA, variance ratio, Kolmogorov-Smirnov; *Zar, 2010*) will be explained and applied.

Part 2: Linear regression (least-squares), basic rules of probability, maximum likelihood estimators, model selection using information criteria (AIC, BIC), generalized linear models (GLMs), especially Poisson regression.

It is highly recommended that you have participated in Part 1 in order to follow Part 2!

Please note that neither of the two parts of this course covers multivariate analysis (-> course by Michael Greenacre) or time series analyses.

Prerequisites:

Basic knowledge of R is requested.

Target Group

Early career scientists with an interest in parameter estimation and hypothesis testing.

Please note:

Instructions for downloading and setting up R are available at http://www.r-project.org.

Please download & install RStudio as well. R and RStudio are freely available and can be used on PCs and Macs.

Literature

- Zar, J.H., Biostatistical Analysis, fifth edition, Prentice Hall, 2010.
- *A good introduction to the frequentist approach to hypothesis testing including data sets*
- *and detailed explanations of test procedures; no computer codes provided.*

- Zuur, A.F., E.N. Ieno, and G.M. Smith, Analysing Ecological Data, Springer, New York,
- 2007. [Data & R code available: http://www.highstat.com]

- More advanced/theoretical background:

- Casella, G. & R.L. Berger, Statistical inference, Duxbury Pacific Grove, CA, 2002.

- Jaynes, E.T., Probability Theory - The Logic of Science, Cambridge University Press, 2003.

- Sivia, D.S. & J. Skilling, Data analysis: a Bayesian tutorial, Oxford University Press, 2006.

Any enquiries regarding the course should be addressed to info.polmar@awi.de or early-career@marum.de