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### Salt-marsh sediment

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## References

## References

- Aagaard, T., Nielsen, N. and Nielsen, J., 1995. Skallingen - Origin and Evolution of a Barrier Spit. Institute of Geography, University of Copenhagen, Copenhagen
- Adam, P., 1990. Saltmarsh ecology. Cambridge University Press, Cambridge
- Allen, J. R. L., 1990. Salt-Marsh Growth and Stratification - A Numerical-Model with Special Reference to the Severn Estuary, Southwest Britain. *Marine Geology*, 95 (2), 77-96
- Allen, J. R. L., 2000. Morphodynamics of Holocene salt marshes: a review sketch from the Atlantic and Southern North Sea coasts of Europe. *Quaternary Science Reviews*, 19 (12), 1155-1231
- Allen, J. R. L. and Haslett, S. K., 2002. Buried salt-marsh edges and tide-level cycles in the mid-Holocene of the Caldicot Level (Gwent), South Wales, UK. *Holocene*, 12 (3), 303-324
- Anjos, R. M., Veiga, R., Carvalho, C., Macario, K. D., and Gomes, P. R. S., 2007. Geological provenance of Quaternary deposits from the southeastern Brazilian coast. *Nuclear Physics A*, 787, 642C-647C
- Anjos, R. M., Veiga, R., Macario, K., Carvalho, C., Sanches, N., Bastos, J., and Gomes, P. R. S., 2006. Radiometric analysis of Quaternary deposits from the southeastern Brazilian coast. *Marine Geology*, 229 (1-2), 29-43
- Armstrong, M., 1998. Basic linear geostatistics. Springer, Berlin
- B**
- Bakker, J. P., 1989. Nature management by grazing and cutting: on the ecological significance of grazing and cutting regimes applied to restore former species-rich grassland communities in the Netherlands. Kluwer Academic Publishers, Dordrecht
- Bakker, J. P., Bunje, J., Dijkema, K. S., Frikke, J., Hecker, N., Kers, A. S., Körber, P., Kohlus, J., and Stock, M., 2005. Salt marshes. In: Essink, K., Dettmann, H., Farke, H., Laursen, K., Lüerßen, G., Marencic, H., and Wiersinga, W., Wadden Sea Quality Status Report, 2004. Common Wadden Sea Secretariat, Wilhelmshaven, 163 - 179
- Bartholdy, J., Christiansen, C., and Kunzendorf, H., 2004. Long term variations in backbarrier salt marsh deposition on the Skallingen peninsula - the Danish Wadden Sea. *Marine Geology*, 203 (1-2), 1-21
- Bartholdy, J. and Madsen, P. P., 1985. Accumulation of Fine-Grained Material in A Danish Tidal Area. *Marine Geology*, 67 (1-2), 121-137
- Berger, M. J., Hubbell, J. H., Seltzer, S. M., Chang, J., Coursey, J. S., Sukumar, R., and Zucker, D. S., 2007. XCOM: Photon Cross Section Database (version 1.3). [Online] Available: <http://physics.nist.gov/xcom>
- Brampton, A. H., 1992. Engineering significance of British saltmarshes. In: Allen, J. R. L. and Pye, K., Saltmarshes. Morphodynamics, Conservation and Engineering significance. Cambridge University Press, Cambridge, 115 - 122
- Briesmeister, J. F., eds., 2000. MCNP TM - A General Monte Carlo N-Particle Transport Code, Version 4C. Los Alamos National Laboratory
- Browne, E. and Firestone, R. B., 1986. Table of radioactive isotopes. John Wiley & Sons, Inc., New York
- Burrough, P. A. and McDonnel, R. A., 1998. Principles of geographical information systems. Oxford University Press, New York
- C**
- Cahoon, D. R., Day, J. W., and Reed, D. J., 1999. The influence of surface and shallow subsurface soil processes on wetland elevation: a synthesis. *Current Topics in Wetland Biochemistry*, 3, 72-88
- CCRX, 1986. De radioactieve besmetting in Nederland ten gevolge van het kernreactor ongeval in Tsjernobyl. Coördinatie-commissie voor Metingen van Radioactiviteit en Xenobiotische Stoffen ; CCRX-secretaris voor radioactieve stoffen. Ministerie van Volkshuisvesting, Ruimtelijke Ordening en Milieubeheer, Den Haag
- Christiansen, C., Pejrup, M., Kepp, R. R., Nielsen, A., Volund, G., and Pedersen, J. B. T., 2004.

- Tidal and meteorological induced nutrient (N, P) dynamics in the micro-tidal Ho Bugt, Danish Wadden Sea. *Danish Journal of Geography*, 104 (1), 87-96
- Dausse, A., Merot, P., Bouzille, J. B., Bonis, A., and Lefeuvre, J. C., 2005. Variability of nutrient and particulate matter fluxes between the sea and a polder after partial tidal restoration, Northwestern France. *Estuarine Coastal and Shelf Science*, 64 (2-3), 295-306
- De Groot, A. V., 2005. Gamma radioactivity on two tidal marshes in the Westerschelde: a pilot study. KVI Internal report Z-118, Kernfysisch Versneller Instituut, Groningen
- De Leeuw, C. C., Grootjans, A. P., Lammerts, E. J., Esselink, P., Stal, L., Stuyfzand, P. J., Van Turnhout, C., Ten Haaf, M. E., and Verbeek, S. K., 2008. Ecologische effecten van duinboog- en washoverherstel. Rijksuniversiteit Groningen, Groningen
- De Leeuw, J., Demunck, W., Oloff, H., and Bakker, J. P., 1993. Does Zonation Reflect the Succession of Salt-Marsh Vegetation - A Comparison of An Estuarine and A Coastal Bar Island Marsh in the Netherlands. *Acta Botanica Neerlandica*, 42 (4), 435-445
- De Meijer, R. J., 1998. Heavy minerals: from 'Edelstein' to Einstein. *Journal of Geochemical Exploration*, 62 (1-3), 81-103
- De Meijer, R. J., 2003. Model for radiometric determination of layer thickness and layer composition. KVI Internal report PAN-006, Kernfysisch Versneller Instituut, Groningen
- De Meijer, R. J. and Donoghue, J. F., 1995. Radiometric Fingerprinting of Sediments on the Dutch, German and Danish Coasts. *Quaternary International*, 26, 43-47
- De Meijer, R. J., James, I. R., Jennings, P. J., and Koeys, J. E., 2001. Cluster analysis of radionuclide concentrations in beach sand. *Applied Radiation and Isotopes*, 54 (3), 535-542
- De Meijer, R. J., Lesscher, H. M. E., Schuiling, R. D., and Elburg, M. E., 1990. Estimate of the Heavy Mineral-Content in Sand and Its Provenance by Radiometric Methods. *Nuclear Geophysics*, 4 (4), 455-460
- De Meijer, R. J., Put, L. W., Schuiling, R. D., de Reus, J. H., and Wiersma, J., 1989. Natural radioactive heavy minerals in sediments along the Dutch coast. *Proceedings KNGMG Symposium 'Coastal Lowlands, Geology and Geotechnology'*, Kluwer Academic Publishers, Dordrecht, the Netherlands, 1987, 355-361
- De Meijer, R. J., Stapel, C., Rozendaal, A., Macdonald, W. G., and Donoghue, J. F., 1997. New approaches to radiometry in heavy mineral exploration and processing. *Heavy Minerals 1997*, South African Institute of Mining and Metallurgy, Johannesburg, 187-196
- De Meijer, R. J., Tanczos, I. C., and Stapel, C., 1994. Radiometric Techniques in Heavy Mineral Exploration and Exploitation. *Exploration and Mining Geology*, 3 (4), 389-398
- Debertin, K. and Helmer, R. G., 1988. *Gamma- and X-ray spectrometry with semiconductor detectors*. Elsevier Science Publishers B.V., Amsterdam
- Dijkema, K. S., 1987a. Changes in salt-marsh area in the Netherlands Wadden Sea after 1600. In: Huiskes, A., Blom, C. W. P. M., and Rozema, J., *Vegetation between land and sea*. Dr. W. Junk Publishers, Dordrecht/Boston/Lancaster, 42-49
- Dijkema, K. S., 1987b. Geography of Salt Marshes in Europe. *Zeitschrift für Geomorphologie*, 31 (4), 489-499
- Dijkema, K. S., Bossinade, J. H., Bouwsema, P., and De Glopper, R. J., 1990. Salt marshes in the Netherlands Wadden Sea: rising high-tide levels and accretion enhancement. In: Beukema, J. J. and et al., *Expected Effects of Climatic Change on Marine Coastal Ecosystems*. Kluwer Academic Publishers, 173 - 188
- Donnelly, C., Kraus, N., and Larson, M., 2006. State of knowledge on measurement and modeling of coastal overwash. *Journal of Coastal Research*, 22 (4), 965-991
- Doody, J. P., 2008. *Saltmarsh conservation, management and restoration*. Springer
- Dyer, F. M., Thomson, J., Croudace, I. W., Cox, R., and Wadsworth, R. A., 2002. Records of change in salt marshes: A radiochronological study of three Westerschelde (SW Netherlands) marshes. *Environmental Science & Technology*, 36 (5), 854-861

## References

### E

- Ehlers, J., 1988a. Morphologische Veränderungen der Wattseite der Barriere-Inseln des Wattenmeeres. *Die Küste Archiv für Forschung und Technik an der Nord und Ostsee*, 47
- Ehlers, J., 1988b. *The morphodynamics of the Wadden Sea*. Balkema, Rotterdam
- Ehlers, J., Nagorny, K., Schmidt, P., Stieve, B., and Zietlow, K., 1993. Storm-Surge Deposits in North-Sea Salt Marshes Dated by Cs-134 and Cs-137 Determination. *Journal of Coastal Research*, 9 (3), 698-701
- Eisma, D. and Dijkema, K. S., 1997. *The influence of salt marsh vegetation on sedimentation. Intertidal deposits: river mouths, tidal flats and coastal lagoons*. CRC Press, Boca Raton, 403-414
- Eleveld, M. A., 1999. *Exploring coastal morphodynamics of Ameland (the Netherlands) with remote sensing techniques and dynamic modelling in GIS*. PhD-thesis, Universiteit van Amsterdam
- Esselink, P., Dijkema, K. S., Reents, S., and Hageman, G., 1998. Vertical accretion and profile changes in abandoned man-made tidal marshes in the Dollard estuary, the Netherlands. *Journal of Coastal Research*, 14 (2), 570-582
- Esselink, P., Zijlstra, W., Dijkema, K. S., and Van Diggelen, R., 2000. The effects of decreased management on plant-species distribution patterns in a salt marsh nature reserve in the Wadden Sea. *Biological Conservation*, 93 (1), 61-76
- Evans, R. D., 1969. *The Atomic Nucleus*. McGraw-Hill

### F

- Feenstra, R., 2000. *Medusa Data Logger, version Version 3.0 build 25*, www.medusa-online.com
- Fehrenbacher, G., Meckbach, R., and Jacob, P., 1996. Unfolding the response of a Ge detector used for in-situ gamma-ray spectrometry. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors and Associated Equipment*, 383 (2-3), 454-462
- Field, A., 2005. *Discovering statistics using SPSS*. SAGE Publications Ltd, London
- Flemming, B. W. and Davis, R. A. Jr., 1994. Holocene Evolution, Morphodynamics and Sedimentology of the Spiekeroog Barrier Island System (Southern North Sea). *Senckenbergiana maritima*, 24, 117-155
- Flemming, B. W. and Delafontaine, M. T., 2000. Mass physical properties of muddy intertidal sediments: some applications, misapplications and non-applications. *Continental Shelf Research*, 20 (10-11), 1179-1197
- French, J. R., 2006. Tidal marsh sedimentation and resilience to environmental change: Exploratory modelling of tidal, sea-level and sediment supply forcing in predominantly allochthonous systems. *Marine Geology*, 235 (1-4), 119-136
- French, J. R. and Spencer, T., 1993. Dynamics of Sedimentation in A Tide-Dominated Backbarrier Salt-Marsh, Norfolk, Uk. *Marine Geology*, 110 (3-4), 315-331
- French, J. R., Spencer, T., Murray, A. L., and Arnold, N. S., 1995. Geostatistical Analysis of Sediment Deposition in Two Small Tidal Wetlands, Norfolk, UK. *Journal of Coastal Research*, 11 (2), 308-321
- Friedrichs, C. T. and Perry, J. E., 2001. Tidal salt marsh morphodynamics: a synthesis. *Journal of Coastal Research*, SI, No. 27, 7-37

### G

- Gering, F., Kiefer, P., Fesenko, S., and Voigt, G., 2002. In situ gamma-ray spectrometry in forests: Determination of kerma rate in air from Cs-137. *Journal of Environmental Radioactivity*, 61 (1), 75-89
- Godfrey, P. J. and Godfrey, M. M., 1974. The role of overwash and inlet dynamics in the formation of salt marshes on North Carolina barrier islands. In: Reimold, R. J. and Queen, W. H., *Ecology of Halophytes*. Academic Press, New York, 407-427
- Golden Software, I., 1999. *Surfer User's Guide; Contouring and 3D Surface Mapping for*

- Scientists and Engineers. Golden Software, inc., Golden, Colorado
- Greenfield, M. B., De Meijer, R. J., Put, L. W., Wiersma, J., and Donoghue, J. F., 1989. Monitoring Beach Sand Transport by Use of Radiogenic Heavy Minerals. *Nuclear Geophysics*, 3 (3), 231-244
- H**
- Harvey, M. M., Hansom, J. D., and MacKenzie, A. B., 2007. Constraints on the use of anthropogenic radionuclide-derived chronologies for saltmarsh sediments. *Journal of Environmental Radioactivity*, 95 (2-3), 126-148
- Helmer, R. G., Gehrke, R. J., and Carpenter, M. V., 1999. Three types of photon detectors for in situ measurements. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors and Associated Equipment*, 422 (1-3), 826-831
- Hendriks, P. H. G. M., 2003. In-depth  $\gamma$ -ray studies; Borehole measurements. PhD-thesis, University of Groningen
- Hendriks, P. H. G. M., Limburg, J., and De Meijer, R. J., 2001a. Full-spectrum analysis of natural gamma-ray spectra. *Journal of Environmental Radioactivity*, 53 (3), 365-380
- Hendriks, P. H. G. M., Maučec, M., and De Meijer, R. J., 2001b. Sediment-Density Dependence of Natural Gamma Ray Spectra in a Borehole Geometry. Proceedings, International conference on advanced Monte Carlo for radiation physics, particle transport simulation and applications, MC 2000, Lisbon, Portugal, 2000b, 893 - 898
- Hendriks, P. H. G. M., Maučec, M., and De Meijer, R. J., 2002. MCNP modelling of scintillation-detector gamma-ray spectra from natural radionuclides. *Applied Radiation and Isotopes*, 57 (3), 449-457
- Hengl, T., 2007. A practical guide to geostatistical mapping of environmental variables. EUR 22904 EN-2007, European Commission, Joint Research Centre, Institute for Environment and Sustainability, Luxembourg: Office for Official Publications of the European Communities
- J**
- Jones, D. G., 2001. Development and application of marine gamma-ray measurements: a review. *Journal of Environmental Radioactivity*, 53 (3), 313-333
- K**
- Kers, A. S., Van der Brug, S. R., Schoen.L., Bos, D., and Bakker, J. P., 1998. Vegetatiekartering Oost-Schiermonnikoog, 1993 - 1996. Laboratorium voor Plantenecologie, Rijksuniversiteit Groningen
- Kirwan, M. L. and Murray, A. B., 2007. A coupled geomorphic and ecological model of tidal marsh evolution. *Proceedings of the National Academy of Sciences of the United States of America*, 104 (15), 6118-6122
- Kluson, J., 2001. Environmental monitoring and in situ gamma spectrometry. *Radiation Physics and Chemistry*, 61 (3-6), 209-216
- Knoll, G. F., 2000. *Radiation Detection and Measurement*. John Wiley and Sons, Inc.
- Koomans, R. L., 2008. Bepaling slibfractie en dichtheid waterbodem. Medusa Innovatie Notitie MIN 8a, Medusa Explorations BV, Groningen
- Kuijper, D. P. J., 2004. Small herbivores losing control: Plant-herbivore interactions along a natural productivity gradient. PhD-thesis, University of Groningen
- Kuijper, D. P. J and Bakker, J. P., 2003. Large-scale effects of a small herbivore on salt-marsh vegetation succession, a comparative study. *Journal of Coastal Conservation*, 9, 179-188
- L**
- Langlois, E., Bonis, A., and Bouzille, J. B., 2003. Sediment and plant dynamics in saltmarshes pioneer zone: *Puccinellia maritima* as a key species? *Estuarine Coastal and Shelf Science*, 56 (2), 239-249
- Lassen, H., 1989. Ortliche und Zeitliche Variationen des Meeresspiegels in der südöstlichen Nordsee. *Die Küste.Archiv für Forschung und Technik an der Nord und Ostsee*, 50, 65-96

## References

- Ligero, R. A., Ramos-Lerate, I., Barrera, M., and Casas-Ruiz, M., 2001. Relationships between sea-bed radionuclide activities and some sedimentological variables. *Journal of Environmental Radioactivity*, 57 (1), 7-19
- Limburg, J., 2003. MEDUSA Post Analysis, MPA 2002, [www.medusa-online.com](http://www.medusa-online.com)
- M**
- Macdonald, W. G., Rozendaal, A., and De Meijer, R. J., 1997. Radiometric characteristics of heavy mineral deposits along the west coast of South Africa. *Mineralium Deposita*, 32 (4), 371-381
- Madsen, A. T., Murray, A. S., Andersen, T. J., Pejrup, M., and Breuning-Madsen, H., 2005. Optically stimulated luminescence dating of young estuarine sediments: a comparison with Pb-210 and Cs-137 dating. *Marine Geology*, 214 (1-3), 251-268
- Maučec, M., De Meijer, R. J., Rigollet, C., Hendriks, P. H. G. M., and Jones, D. G., 2004a. Detection of radioactive particles offshore by gamma-ray spectrometry - Part I: Monte Carlo assessment of detection depth limits. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors and Associated Equipment*, 525, 593-609
- Maučec, M., De Meijer, R. J., Van der Klis, M. M. I. P., Hendriks, P. H. G. M., and Jones, D. G., 2004b. Detection of radioactive particles offshore by gamma-ray spectrometry - Part II: Monte Carlo assessment of acquisition times. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors and Associated Equipment*, 525 (3), 610-622
- Medusa Explorations, 2000. Medusa Data Synchronizer, version MDS\_2000, [www.medusa-online.com](http://www.medusa-online.com)
- Mitsch, W. J., eds., 1994. *Global wetlands: old world and new*. Elsevier, Amsterdam
- Möller, I., Spencer, T., French, J. R., Leggett, D. J., and Dixon, M., 1999. Wave transformation over salt marshes: A field and numerical modelling study from north Norfolk, England. *Estuarine Coastal and Shelf Science*, 49 (3), 411-426
- N**
- Nederbragt, G. and Koomans, R. L., 2005. Nourishment of the slope of a tidal channel. From experiment to practice. *Proceedings of the Fifth Coastal Dynamics International Conference*, Barcelona, Spain, April 4-8, 2005,
- Nederlands Normalisatie-instituut, 2002. Nederlandse Norm NEN 5623 (nl); Radioactiviteitsmetingen - Bepaling van de activiteit van gammastraling uitzendende nucliden in een telmonster met halfgeleider-gammaspectrometrie. ICS 17.240-10, Delft
- Neumeier, U. and Amos, C. L., 2006. The influence of vegetation on turbulence and flow velocities in European salt-marshes. *Sedimentology*, 53 (2), 259-277
- Nielsen, J. and Nielsen, N., 2006a. Washover geomorphology on a barrier spit, Skallingen, Denmark. *Journal of Coastal Research*, Special Issue 39, 678-681
- Nielsen, N. and Nielsen, J., 2006b. Development of a washover fan on a transgressive barrier, Skallingen, Denmark. *Journal of Coastal Research*, Special Issue 39, 107-111
- O**
- Oloff, H., De Leeuw, J., Bakker, J. P., Platerink, R. J., Van Wijnen, H. J., and De Munck, W., 1997. Vegetation succession and herbivory in a salt marsh: changes induced by sea level rise and silt deposition along an elevational gradient. *Journal of Ecology*, 85 (6), 799-814
- Oost, A. P., 1995. Dynamics and sedimentary development of the Dutch Wadden Sea with emphasis on the Frisian inlet. PhD-thesis, Universiteit Utrecht
- Oost, A. P., 1998. The influence of selective transport and provenance on the radiometric fingerprint method. KVI Internal report Kernfysisch Versneller Instituut, Groningen
- Oost, A. P. and De Boer, P. L., 1994. Sedimentology and Development of Barrier Islands, Ebb-tidal Deltas, Inlets and Backbarrier Areas of the Dutch Wadden Sea. *Senckenbergiana maritima*, 24, 65-115

- Oxford Instruments Inc. Nuclear Measurements Group, 1993. GammaTrac Version 1.21 Operation Manual.
- P**
- Paridaens, J., 2006. Development of a low cost, GPS-based upgrade to a standard handheld gamma detector for mapping environmental radioactive contamination. *Applied Radiation and Isotopes*, 64 (2), 264-271
- Pedersen, J. B. T. and Bartholdy, J., 2007. Exposed salt marsh morphodynamics: An example from the Danish Wadden Sea. *Geomorphology*, 90, 115-125
- Pelowitz, D. P., eds., 2005. MCNPXTM User's Manual, version 2.5.0. Los Alamos National Laboratory
- Perrin, J., Carrier, F., and Guillot, L., 2006. Determination of the vertical distribution of radioelements (K, U, Th, Cs) in soils from portable HP-Ge spectrometer measurements: A tool for soil erosion studies. *Applied Radiation and Isotopes*, 64 (7), 830-843
- Pethick, J. S., 1992. Saltmarsh geomorphology. In: Allen, J. R. L. and Pye, K., *Saltmarshes. Morphodynamics, conservation and engineering significance*. Cambridge University Press, Cambridge, 41 - 62
- Philander, C., Rozendaal, A., and De Meijer, R. J., 1999. Characteristics of zircon in placer deposits along the west coast of South Africa. *South African Journal of Science*, 95 (9), 381-386
- Plamboeck, A. H., Nylén, T., and Agren, G., 2006. Comparative estimations of Cs-137 distribution in a boreal forest in northern Sweden using a traditional sampling approach and a portable NaI detector. *Journal of Environmental Radioactivity*, 90 (2), 100-109
- Postma, H., 1961. Transport and accumulation of suspended matter in the Dutch Wadden Sea. *Netherlands Journal of Sea Research*, 1, 148-190
- Postma, H., 1967. Sediment transport and sedimentation in the estuarine environment. In: Lauff, G. A., *Estuaries*. American Association for the Advancement of Science, Washington D.C., 158 - 179
- Pringle, A. W., 1995. Erosion of A Cyclic Salt-Marsh in Morecambe Bay, North-West England. *Earth Surface Processes and Landforms*, 20 (5), 387-405
- Q**
- Qual, W., 2003. Vegetationsmosaik auf der Insel Schiermonnikoog; Kleinmaßstäbliche Wechselwirkungen zwischen Vegetation, Höhenlage, Sedimentation und Herbivorie. TU München-Weihenstephan
- R**
- Reineck, H. E. and Gerdes, G., 1996. A seaward prograding siliciclastic sequence from upper tidal flats to salt marsh facies (southern North Sea). *Facies*, 34, 209-218
- Reitsma, D. T. and Bakker, J. P., 1986. Landgebruik op Schiermonnikoog, vroeger en nu. *Waddenbulletin*, 21, 94-100
- Rijkswaterstaat, 2008. WaterStat. <http://www.waterstat.nl/>
- Rijkswaterstaat Directie Friesland and Rijkswaterstaat Meetkundige dienst, 1991. Handleiding bij de vegetatiekaart van Schiermonnikoog.
- Rijkswaterstaat RIKZ Haren, 1998. Sedimentatlas Waddenzee. [www.waddenzee.nl/sedimentatlas.729.0.html](http://www.waddenzee.nl/sedimentatlas.729.0.html)
- Roozen, A. J. M. and Westhoff, V., 1985. A Study on Long-Term Salt-Marsh Succession Using Permanent Plots. *Vegetatio*, 61 (1-3), 23-32
- Royal Netherlands Navy Hydrographic Service, 2003. PCTrans, version Version 3.2.e
- S**
- Saito, K. and Jacob, P., 1995. Gamma-Ray Fields in the Air Due to Sources in the Ground. *Radiation Protection Dosimetry*, 58 (1), 29-45
- Samenwerkingsverband Het Tijn Geleerd, 2007a. Het Tijn Geleerd; Achtergrondrapport.
- Samenwerkingsverband Het Tijn Geleerd, 2007b. Het Tijn Geleerd; Natuurherstel en onderzoek in



## References

- het waddengebied. [www.hettijgeleerd.nl](http://www.hettijgeleerd.nl)
- Schimmack, W., Steindl, H., and Bunzl, K., 1998. Variability of water content and of depth profiles of global fallout Cs-137 in grassland soils and the resulting external gamma-dose rates. *Radiation and Environmental Biophysics*, 37 (1), 27-33
- Schoorl, H., 2000. De Convexe Kustboog; Texel - Vlieland - Terschelling; Bijdragen tot de kennis van het westelijk Waddengebied en de eilanden Texel, Vlieland en Terschelling. Deel 4; De Convexe Kustboog en het eiland Terschelling. Pirola, Schoorl
- Scintrex Limited, Manual Scintrex GIS-5 Integrating Gamma Spectrometer.
- Stapel, C., Tanczos, I. C., and De Meijer, R. J., 1992. IJking van de Scintrex GIS-5. KVI Internal report Z-17, Kernfysisch Versneller Instituut, Groningen
- Stoddart, D. R., Reed, D. J., and French, J. R., 1989. Understanding Salt-Marsh Accretion, Scolt Head Island, Norfolk, England. *Estuaries*, 12 (4), 228-236
- ### T
- Temmerman, S., Bouma, T. J., Govers, G., and Lauwaet, D., 2005a. Flow paths of water and sediment in a tidal marsh: Relations with marsh developmental stage and tidal inundation height. *Estuaries*, 28 (3), 338-352
- Temmerman, S., Bouma, T. J., Govers, G., Wang, Z. B., De Vries, M. B., and Herman, P. M. J., 2005b. Impact of vegetation on flow routing and sedimentation patterns: Three-dimensional modeling for a tidal marsh. *Journal of Geophysical Research-Earth Surface*, 110 (F4)
- Temmerman, S., Bouma, T. J., Van de Koppel, J., Van der Wal, D. D., De Vries, M. B., and Herman, P. M. J., 2007. Vegetation causes channel erosion in a tidal landscape. *Geology*, 35 (7), 631-634
- Temmerman, S., Govers, G., Wartel, S., and Meire, P., 2003. Spatial and temporal factors controlling short-term sedimentation in a salt and freshwater tidal marsh, Scheldt estuary, Belgium, SW Netherlands. *Earth Surface Processes and Landforms*, 28 (7), 739-755
- Temmerman, S., Govers, G., Wartel, S., and Meire, P., 2004. Modelling estuarine variations in tidal marsh sedimentation: response to changing sea level and suspended sediment concentrations 11. *Marine Geology*, 212 (1-4), 1-19
- Ten Haaf, M. E. and Buijs, P., 2008. Verdiepende Studies Morfologie: Morfologie, hydraulica en ecologie van washoversystemen. Universiteit Utrecht
- Thummerer, S. and Jacob, P., 1998. Determination of depth distributions of natural radionuclides with in situ gamma-ray spectrometry. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors and Associated Equipment*, 416 (1), 161-178
- Torres, R., Fagherazzi, S., Van Proosdij, D., and Hopkinson, C., 2006. Salt marsh geomorphology: Physical and ecological effects on landform. *Estuarine Coastal and Shelf Science*, 69 (3-4), 309-310
- Tsabarlis, C., Eleftheriou, G., Kapsimalis, V., Anagnostou, C., Vlastou, R., Durmishi, C., Kedhi, M., and Kalfas, C. A., 2007. Radioactivity levels of recent sediments in the Butrint Lagoon and the adjacent coast of Albania. *Applied Radiation and Isotopes*, 65 (4), 445-453
- Tyler, A. N., 1999. Monitoring anthropogenic radioactivity in salt marsh environments through in situ gamma-ray spectrometry. *Journal of Environmental Radioactivity*, 45 (3), 235-252
- Tyler, A. N., Davidson, D. A., and Grieve, I. C., 2001. In situ radiometric mapping of soil erosion and field-moist bulk density on cultivated fields. *Soil Use and Management*, 17 (2), 88-96
- Tyler, A. N., Sanderson, D. C. W., and Scott, E. M., 1996. Estimating and accounting for Cs-137 source burial through in-situ gamma spectrometry in salt marsh environments. *Journal of Environmental Radioactivity*, 33 (3), 195-212
- ### V
- Van de Koppel, J., Van der Wal, D., Bakker, J. P., and Herman, P. M. J., 2005. Self-organization and vegetation collapse in salt marsh ecosystems. *The American Naturalist*, 165 (1), E1-E12
- Van der Graaf, E. R., Rigollet, C., Maleka, P. P., and Jones, D. G., 2007. Testing and assessment of

- a large BGO detector for beach monitoring of radioactive particles. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors and Associated Equipment*, 575 (3), 507-518
- Van der Graaf, E. R., Van der Klis, M. M. I. P., De Meijer, R. J., and Bolk, H. J. N. A., 2004. Novel technique for in-situ determination of composition and thickness of asphalt layers. *Proceedings of the 3<sup>rd</sup> Eurasphalt and Eurobitume congress, Vienna 2004*,
- Van der Klis, M. M. I. P., 2002. Test and calibration of PANDORA, a large volume BGO detector for the in situ measurement of environmental radioactivity. KVI Internal report PAN-002, Kernfysisch Versneller Instituut, Groningen
- Van der Wal, D., Wielemaker-Van den Dool, A., and Herman, P. M. J., 2008. Spatial patterns, rates and mechanisms of saltmarsh cycles (Westerschelde, The Netherlands). *Estuarine Coastal and Shelf Science*, 76 (2), 357-368
- Van Duin, W. E., Dijkema, K. S., and Zegers, J., 1997. Veranderingen in bodemhoogte (opslibbing, erosie en inklink) in de Peazemerlanden. IBN-rapport 326, Instituut voor Bos- en Natuuronderzoek, Wageningen
- Van Proosdij, D., Davidson-Arnott, R. G. D., and Ollerhead, J., 2006. Controls on spatial patterns of sediment deposition across a macro-tidal salt marsh surface over single tidal cycles. *Estuarine Coastal and Shelf Science*, 69 (1-2), 64-86
- Van Straaten, L. M. J. U., 1954. Composition and structure of recent marine sediments in the Netherlands. *Leidse Geologische Mededelingen*, XIX, 4-96
- Van Straaten, L. M. J. U. and Kuenen, P. H., 1958. Tidal action as a cause of clay accumulation. *Journal of Sedimentary Research*, 28 (4), 406-413
- Van Wijnen, H. J. and Bakker, J. P., 2001. Long-term surface elevation change in salt marshes: a prediction of marsh response to future sea-level rise. *Estuarine Coastal and Shelf Science*, 52 (3), 381-390
- Van Wijngaarden, M., Venema, L. B., and De Meijer, R. J., 2002a. Radiometric sand mud characterisation in the Rhine-Meuse estuary part B. In situ mapping. *Geomorphology*, 43 (1-2), 103-116
- Van Wijngaarden, M., Venema, L. B., De Meijer, R. J., Zwolsman, J. J. G., Van Os, B., and Gieske, J. M. J., 2002b. Radiometric sand-mud characterisation in the Rhine-Meuse estuary part A. Fingerprinting. *Geomorphology*, 43 (1-2), 87-101
- Venema, L. B. and De Meijer, R. J., 2001. Natural radionuclides as tracers of the dispersal of dredge spoil dumped at sea. *Journal of Environmental Radioactivity*, 55 (3), 221-239
- Vos, P. C. and Van Kesteren, W. P., 2000. The long-term evolution of intertidal mudflats in the northern Netherlands during the Holocene; natural and anthropogenic processes. *Continental Shelf Research*, 20 (12-13), 1687-1710
- W**
- Wackernagel, H., 1995. *Multivariate geostatistics*. Springer Verlag, Berlin
- Walling, D. E. and He, Q., 1997. Use of fallout Cs-137 in investigations of overbank sediment deposition on river floodplains. *Catena*, 29 (3-4), 263-282
- Wheeler, A. J., Orford, J. D., and Dardis, O., 1999. Saltmarsh deposition and its relationship to coastal forcing over the last century on the north-west coast of Ireland. *Geologie en Mijnbouw-Netherlands Journal of Geosciences*, 77 (3-4), 295-310
- Z**
- Zwarts, L., 2004. *Bodemgesteldheid en mechanische kokkelvisserij in de Waddenzee*. Rapport RIZA/2004.028, Ministerie van Verkeer en Waterstaat