



PUBLICATION REPORT OF THE GEODYNAMICS TEAM OF THE GEOLOGICAL SURVEY OF NORWAY - 2010

1. PEER REVIEWED PUBLICATIONS

1. Bache F., Olivet J.-L., Gorini C., Aslanian D., **Labails C.**, Rabineau M., 2010. Evolution of rifted continental margins: the case of the Gulf of Lions (Western Mediterranean Basin). *Earth and Planetary Science Letters*, 292, 3-4, p. 345-356.
2. Boyden, J. A., R. D. Müller, M. Gurnis, **T.H. Torsvik**, J. A. Clark, M. Turner, H. Ivey-Law, R. **J. Watson**, J. S. Cannon, 2010. Next-generation plate-tectonic reconstructions using GPlates, in G. R. Keller and C. Baru, eds., *Geoinformatics: Cyberinfrastructure for the Solid Earth Sciences*, Cambridge University Press.
3. Dupont-Nivet, G., van Hinsbergen, D.J.J., **Torsvik, T.H.**, 2010. Persistently low Asian paleolatitudes: implications for the Indo-Asian collision. *Tectonophysics* 29, TC5016, doi:10.1029/2008TC002437, 2010.
4. Dypvik, H., Smelror, M., Mørk A., Tsikalas, F., Faleide, J.I., Werner, S.C., **Torsvik, T.H.**, 2010. Geological Framework. In: *The Mjølner Impact Event and its Consequences: Geology and Geophysics of a Late Jurassic/Early Cretaceous Marine Impact Event*, Dypvik, H., Smelror, M. (Eds.), Springer, ISBN: 978-3-540-88259-6, pp. 23-46.
5. Dypvik, H., Smelror, M., Mørk, A., Werner, S.W., **Torsvik, T.H.**, 2010. Impact Cratering and Post-impact Sedimentation. In: *The Mjølner Impact Event and its Consequences: Geology and Geophysics of a Late Jurassic/Early Cretaceous Marine Impact Event*, Dypvik, H., Smelror, M. (Eds.), Springer, ISBN: 978-3-540-88259-6, pp. 139-174.
6. **Gaina, C.**, Werner, S.C, Mandaia, M. and the CAMP-GM group, Circum-Arctic Magnetic and Gravity Maps, CCGM/CCWM 2010
7. **Gaina, C.**, Medvedev, S. G. Viola, and the TAP group, The African Plate: Lithosphere and Mantle Interactions and Implications for Basin Evolution - Preliminary insights into Regional Present Day and Paleo-stresses, AAPG European Newsletter, December 2010
8. **Ganerød, M. Smethurst, M.A., Torsvik, T.H.**, Prestvik, T., Rouse, S., McKenna, C., van Hinsbergen, D.J.J., **Hendriks, B.W.H.**, 2010. The North Atlantic Igneous Province reconstructed and its relation to the Plume Generation Zone: the Antrim Lava Group revisited. *Geophys. J. Int.* 182, 183–202.
9. **Hendriks, B.W.H.**, Osmundsen, P.T., **Redfield, T.F.**, 2010, Normal faulting and block tilting in Lofoten and Vesterålen constrained by Apatite Fission Track data, *Tectonophysics* 485, pp. 154 – 163
10. van Hinsbergen D.J.J. Kaymakci, N., Spakman W., **Torsvik, T.H.**, 2010. Reconciling the geological history of western Turkey with plate circuits and mantle tomography. *Earth Planetary Sci. Lett.* 297, 674–686.
11. **Labails C.**, Olivet J.-L., Aslanian D., Roest W.R., 2010. An alternative early opening scenario for the Central Atlantic Ocean. *Earth and Planetary Science Letters*, 297, 355-36

12. **Labails C.**, Roest, W.R., 2010. Comments on "Breakup of Pangaea and plate kinematics of the Central Atlantic and Atlas region" by Schettino and Turco. *Geophysical Journal International*, 183(1), 96–98
13. Nývlt, D., Košler, J., Mlčoch, B., Mixa, P., Lisá, L., Bubík, M., **Hendriks, B.W.H.**, The Mendel Formation: implications for Late Miocene climatic cyclicity at the northern tip of the Antarctic Peninsula, *Palaeogeography, Palaeoclimatology, Palaeoecology*, 2010. PALAEO5593
14. Osmundsen, P.T., **Redfield, T.F.**, **Hendriks, B.W.H.**, Bergh, S., Hansen, J.-A., Henderson, I.H.C., Dehls, J., Lauknes, T.R., Larsen, Y., Anda, E., Davidsen, B., 2010. Fault-controlled alpine topography in Norway, *Journal of the Geological Society* 167, pp. 83 – 98
15. **Redfield, T.F.**, 2010. On apatite fission track dating and the Tertiary evolution of West Greenland topography, *Journal of the Geological Society*, 167, 261-271, doi: 10.1144/0016-76492009-036
16. Roberts, R., Corfu, F., **Torsvik, T.H.**, Hetherington, C., Ashwal LD. 2010. Alkaline and carbonatitic magmatism coeval with mafic plutonism in the Seiland Igneous Province, Northern Norway: age and palaeotectonic significance. *J. Geol. Soc. Lond.*, 167, 71-81
17. Steinberger, B., **Torsvik, T.H.**, 2010. Explanation for the present and past locations of the poles. *Geochem. Geophys. Geosyst.*, Q06W06, doi:10.1029/2009GC002889.
18. Steinberger, B., Werner, S.C., **Torsvik, T.H.**, 2010. Deep versus shallow origin of gravity anomalies, topography and volcanism on Earth, Venus and Mars. *Icarus*, 207, 564-577, doi:10.1016/j.icarus.2009.12.025.
19. Steinberger, B., Werner, S.C., **Torsvik, T.H.** 2010. Deep versus shallow origin of gravity anomalies, topography and volcanism on Earth, Venus and Mars. *Icarus*, 207, 564–577.
20. Steinberger, B., **Torsvik, T.H.**, 2010. Toward an explanation for the present and past locations of the poles. *Geochem. Geophys. Geosyst.*, 11, doi:10.1029/2009GC002889.
21. **Torsvik, T.H.**, Steinberger, B., Gurnis, M., **Gaina, C.**, 2010. Plate tectonics and net lithosphere rotation over the past 150 My. *Earth Planet. Sci. Lett.*, 291, 106-112, doi:10.1016/j.epsl.2009.12.055.
22. **Torsvik, T.H.**, Steinberger, B., Gurnis, M., **Gaina, C.**, 2010. Plate Tectonics and Net Lithosphere Rotation over the past 150 My, *Earth and Planetary Science Letters*, doi:10.1016/j.epsl.2009.12.055.
23. **Torsvik, T.H.**, Rouse, S., **Smethurst, M.A.**, 2010. Reply to comment by D. Aslanian and M. Moulin on ‘A new scheme for the opening of the South Atlantic Ocean and the dissection of an Aptian salt basin’. *Geophys. J. International*: DOI: 10.1111/j.1365-246X.2010.04728.x
24. **Torsvik, T.H.**, Burke, K., Steinberger, B., Webb, S.J., Ashwal, L.D., 2010. Diamonds sampled by plumes from the core-mantle boundary. *Nature*, 466, 352–355, doi:10.1038/nature09216.
25. Tsikalas, F., Faleide, J.I., Werner, S.C., **Torsvik, T.H.**, Gudlaugsson, S.T., Eldholm, O. 2010. Impact Geophysics and Modelling. In *The Mjølner Impact Event and its Consequences: Geology and Geophysics of a Late Jurassic/Early Cretaceous Marine Impact Event*, Dypvik, H., Smelror, M. (Eds.), Springer, ISBN: 978-3-540-88259-6, 75-138.
26. van der Meer, D., Spakman, W., van Hinsbergen, D.J.J., Amaru, M.L., **Torsvik, T.H.** 2010. Absolute plate motions since the Permian inferred from lower mantle slab remnants. *Nature Geoscience*, doi:10.1038/NGEO708.
27. Werner, S.C., **Torsvik, T.H.**, 2010. Downsizing the Mjølner impact structure, Barents Sea, Norway. *Tectonophysics*, 483, 191-202.
28. Yuan, K., van der Voo, R., Bazhenov, M., Bakhmutov, V., Alekhin, V., **Hendriks, B.W.H.**, 2010. Permian and Triassic Paleolatitudes of the Ukrainian Shield with Implications for Pangea Reconstructions, *Geophysical Journal International*, GJI-S-10-0362

2. REPORTS

1. **Gaina, C.**, Werner, S.C., 2010. Circum-Arctic Mapping Project - Gravity and magnetic maps (CAMP - GM), NGU report 2009.010

2. Heincke, B.H.; **Watson, R.J.**, Møller, T., 2010. Determination of altitude-dependence of standard spectra and stripping ratios for the GR820 Airborne Gamma Ray Spectrometry, NGU report 2009.042.
3. Henderson, I.H.C., Osmundsen, P.T., **Redfield, T.**, 2010. ROS fjellskred i Troms: status og planer 2010, NGU report 2010.021.
4. Steinberger, B., **S. Buiter**, S. Medvedev, **J. Tetreault**, 2010. The mantle under Africa: An overview of global and regional tomography models, lithosphere thickness models and their effect on present-day and past dynamic topography, NGU report 2010.058 (confidential until 01.12.2012)

3. CONFERENCE ABSTRACTS

1. Baranwal, V.C., **R.J. Watson**, M.A. **Smethurst**, J.S. Rønning. Geological mapping using airborne gamma ray spectrometry. GammaSem, Kjeller, 28-29 September 2010.
2. Brønner, M., Olesen, Ol, Dalsegg, E., **Hendriks**, B., Fredin, O., Fabian, K., Bering, D., Solbakk, T., Magnus, C., Øverland, J.A., Rønning, J.S. and Møller, T., Deep weathering in the Lofoten-Vesterålen area – first results from the NGU-NPD TWIN project, Nordic Winter Meeting, Oslo, January 11-13, 2010
3. **Buiter, S.**, G. Schreurs and the GeoMod2008 Team, Benchmarking the Sandbox: Quantitative Comparisons of Numerical and Analogue Models of Brittle Wedge Dynamics, AGU Fall Meeting, 13-17 December, San Francisco (**invited**)
4. **Buiter, S.**, The ingredients of numerical models of subduction, crust-to-core meeting, 15-17 November, Marianska Lazne, Czech Republic (**invited**)
5. **Buiter, S.**, G. Schreurs and the GeoMod2008 Team, When are models equal? Comparing numerical and analogue models of brittle thrust wedges, GeoMod2010, 27 - 29 September, Lisbon, Portugal (**invited**)
6. **Buiter, S.**, G. Schreurs, M. Albertz, M. Cooke, T. Crook, D. Egholm, S. Ellis, T. Gerya, L. Hodkinson, B. Kaus, W. Landry, B. Maillot, Y. Mishin, C. Pascal, A. Popov, C. Beaumont, P. Souloumiac, Quantitative comparisons of numerical models of brittle contractional deformation, 29th Nordic Geological Winter Meeting, 11-13 January 2010, Oslo (**keynote**)
7. **Buiter, S.**, S. Ellis, The Initiation of Subduction Models, AGU Fall Meeting, 13-17 December, San Francisco
8. **Buiter, S.**, Dynamic subduction models: How initial choices affect the outcomes, 2010 CAS kickoff meeting: Voodoo Tectonics, August, Oslo
9. **Buiter, S.**, M. Albertz, M. Cooke, T. Crook, D. Egholm, S. Ellis, T. Gerya, L. Hodkinson, B. Kaus, W. Landry, B. Maillot, Y. Mishin, C. Pascal, G. Schreurs, P. Souloumiac, C. Beaumont, Quantitative comparisons of numerical models of brittle wedge dynamics, EGU General Assembly, 2-7 May, Vienna, Austria
10. **Buiter, S.**, B. Steinberger, **J. Tetreault**, S. Medvedev, M. Gravrak, **C. Gaina**, Could the mantle cause subsidence of the Congo Basin? Workshop on the Cuvette Centrale, Royal Museum for Central Africa, Tervuren, Belgium, 26 January 2010
11. **Buiter, S.**, G. Schreurs and the GeoMod2008 Team, Benchmarking the sandbox: A comparison of numerical and analogue brittle wedge experiments, GFZ Potsdam, Germany, 8 February 2010 (**invited**)
12. **Buiter, S.**, G. Schreurs and the GeoMod2008 Team, Benchmarking the sandbox: A comparison of numerical and analogue brittle wedge experiments, GNS Science, Lower Hutt, New Zealand, 11 March 2010 (**invited**)
13. **Buiter, S.**, G. Schreurs and the GeoMod2008 Team, Benchmarking the sandbox: A comparison of numerical and analogue brittle wedge experiments, Charles University Prague, Czech Republic, 10 June 2010 (**invited**)
14. Burke, K.C., **Torsvik, T.H.** New results show that the long term stability of Large Low Shear Wave Velocity Provinces (LLSVPs) on the CMB has lasted for at least 540 My. AGU San Francisco, December 2010.

15. **Chemia, Z.**, Dolejš, D., Steinle-Neumann, G., Thermal effects of metamorphic reactions in a three-component slab, European Geosciences Union General Assembly 2010, Vienna, Austria
16. **Chemia, Z.**, Dolejš, D., Steinle-Neumann, G., Thermal effects of metamorphic reactions in a three-component slab, c2c workshop, Trondheim, Norway, 01-05 June 2010
17. **Chemia, Z.**, Dolejš, D., Steinle-Neumann, G., Thermal effects of metamorphic reactions in a three-component slab, Project meeting, Bayreuth, Germany, 05-11 July 2010
18. **Chemia, Z.**, **S. Buiter**, The fate of subducted sediments at convergent plate boundaries, GeoMod2010, Lisbon, Portugal, 27 - 29 September 2010
19. **Chemia, Z.**, Dolejš, D., Steinle-Neumann, G., **Buiter, S.**, Thermal evolution of a litho-chemical subducting slab, c2c workshop, Mariánské Lázně, Czech republic, 15-17 November 2010
20. Doubrovine, P V, Steinberger, B, **Torsvik, T.H.**, A Global Moving Hotspot Reference Frame: How well it fits? AGU San Francisco, December 2010
21. **Gaina, C.**, and the TAP group, The Evolution of the African Plate since the Jurassic, South Atlantic Margin Processes and links with onshore evolution, DFG Special programme workshop, Kiel, June 2010 (**invited**)
22. **Gaina, C.**, S. Werner, R. Saltus, S. Medvedev, and CAMP-GM group, Structure and evolution of the Arctic in the light of new geophysical compilation and regional kinematics, Conference of Mathematical Geophysics, Pisa, June 2010 (**invited**)
23. **Gaina, C.**, Aaro, S., Damaske, D., Ebbing, J., Forsberg, R., Glebovsky, V., Johnson, K., Jonberger, J., Koren, T., Korhonen, J., Litvinova, T., Oakey, G., Olesen, O., Petrov, O.V., Pilkington, M., Rasmussen, T., Saltus, R., Schreckenberger, B., Smelror, M., Geophysical maps of Circumpolar Arctic at scale 1:5 M. Arctic Tectonic Map Workshop, St. Petersburg 7-9 April, 2010.
24. **Gaina, C.**, Aaro, S., Damaske, D., Forsberg, R., Glebovsky, V., Johnson, K., Jonberger, J., Koren, T., Korhonen, J., Litvinova, T., Maus, S., Oakey, G., Olesen, O., Petrov, O.V., Pilkington, M., Rasmussen, T., Saltus, R., Schreckenberger, B., Smelror, M., Geophysical maps of Circumpolar Arctic at scale 1:5 M. Arctic Energy 2010, The Third Conference on Arctic Geology and Resources, Tromsø 3-4 June, 2010.
25. **Gaina, C.**, **C. Labails**, C. Reeves: The Early Opening of the Indian Ocean: An African Perspective, AGU Fall Meeting, San Francisco, USA, December 2010
26. **Ganerød, M.**, Foredrag for Byåsen Videregående skole. Klasse Teknologi og Forskningslære 2. "Magnetisme, paleomagnetisme og geokronologi". Onsdag 17.11.2010.
27. **Ganerød, M.**, **Torsvik, T.H.**, van Hinsbergen, D.J.J, **Gaina, C.**, Corfu, F., Werner, S., Owen-Smith, T., Ashwal, L.D., Webb, S.J. and **Hendriks, B.W.H.**, Paleoposition of the Seychelles microcontinent in relation to the Deccan Traps and the Plume Generation Zone in Late Cretaceous-Early Palaeogene time. AGU, San Francisco, December 2010
28. **Hendriks, B.**, **T. Torsvik**, K. Burke , 2010. The relationship between African and Pacific Cenozoic volcanism & the Plume Generation Zone, CAS Kickoff Meeting: Voodoo Tectonics, Oslo, Norway
29. **Hendriks, B.W.H.**, P.T. Osmundsen, **T. Redfield**, Normal faulting, block tilting and landscape development in Lofoten and Vesterålen constrained by Apatite Fission Track data, Geophysical Research Abstracts, Vol. 12, EGU2010-8132, EGU General Assembly 2010
30. Kaymakci, N, Van Hinsbergen, D J, Spakman, W, **Torsvik, T.H.**, Reconciling the geological history of western Turkey with plate circuits and mantle tomography. AGU San Francisco, December 2010.
31. **Khabbaz Ghazian, R.**, **S. Buiter**, Styles of deformation in continent-continent collision, GeoMod2010, 27 - 29 September, Lisbon, Portugal
32. **Khabbaz Ghazian, R.**, **S. Buiter**, Styles of deformation in continent-continent collision, c2c meeting, Trondheim, May 31 - June 5, 2010
33. **Labails, C.**, **Gaina, C.**, Skogseid, J., The first stages of evolution of the Western Somali Basin EGU General Assembly, 2-7 May, 2010 in Vienna, Austria
34. **Labails, C.**, Brønner, M., Gernigon, L., Deep crustal structures of the Central Atlantic Ocean conjugate margins: combined approach of seismic, gravity and magnetic investigations,

- Metododirecto.pt/cm2010, II Central and North Atlantic conjugate margins conference, Lisbon, Volume VIII p138-141, 2010
35. **Labails, C.**, Brønner, M., Gernigon, L., Insights on the deep structure of the Central Atlantic Ocean conjugate margins, AGU, Fall Meeting 2010, abstract #T33C-2261
 36. Muller, R.D., Dutkiewicz, A., Seton, M, **Gaina, C.**, Jurassic to present seawater chemistry and climate: Links with the history of seafloor spreading and subduction, EGU, 2-7 May 2010, Vienna
 37. **Quinquis, M., Z. Chemia**, Nicola Tosi, **S. Buiter**, D. Dolejs, A numerical reference model for thermomechanical subduction, EGU General Assembly, 2-7 May 2010, Vienna, Austria
 38. Saltus, R.W., E. L. Miller, **C. Gaina**, Gravity and magnetic anomalies of the western Arctic ocean and its margins provide an imperfect window to a complex, multi-stage tectonic history, AGU Fall Meeting, San Francisco, USA, December 2010
 39. **Redfield, T.**, Modification of passive margin landscapes by active normal faulting in Troms County William Smith conference 'Landscape into Rock' , Geological Society of London, 21-23 september 2010
 40. Schreurs, G., **S. Buiter**, and the GeoMod2008 Analogue Team, Quantitative comparisons of analogue models of brittle wedge dynamics, EGU General Assembly, 2-7 May 2010, Vienna, Austria
 41. Schreurs, G., **S. Buiter** and the GeoMod2008 Analogue Team, Quantitative comparisons of analogue models of brittle thrusting, GeoMod2010, 27 - 29 September 2010, Lisbon, Portugal
 42. Seton, M, Muller, R.D., **Gaina, C.**, Reconstructing the early Jurassic to present Pacific and proto-Pacific Basins: Implications for circum-Pacific plate margins, Australian Earth Sciences Convention 2010
 43. **Smethurst, M.A., R.J. Watson**, V.C. Baranwal, J.S. Rønning. Mobile gamma ray spectrometry and the efficiency of real-time data processing in describing the natural background signal and highlighting anthropogenic nuclides. GammaSem, Kjeller, 28-29 September 2010.
 44. Steinberger, B., **Torsvik, T.H.**, Subduction history and true polar wander, 2010 CAS Kickoff Meeting: Voodoo Tectonics, Oslo, Norway.
 45. **Tetreault, J., S. Buiter**, To accrete or not to accrete? Bridging the gap between thermal-mechanical models of accretionary wedges and subduction dynamics, GeoMod2010, 27 - 29 September 2010, Lisbon, Portugal
 46. **Tetreault, J., S. Buiter**, Geodynamic modelling of terrane accretion, 29th Nordic Geological Winter Meeting, 11-13 January 2010, Oslo
 47. **Tetreault, J., S. Buiter**, Geodynamic modelling of terrane accretion, subduction, and collision, EGU General Assembly, 2-7 May 2010, Vienna, Austria
 48. **Torsvik, T.H.**, A Journey from the inner Earth. The 29th Nordic Geological Winter Meeting Oslo, Norway 11.-13 January 2010 (**Invited Plenum Speaker**).
 49. **Torsvik, T.H.**, Burke, K. Linking the Wilson Cycle to deep Earth processes. AGU San Francisco, December 2010 (**Invited**)
 50. **Torsvik, T.**, Steinberger, B., Gurnis, M., **Gaina, C.**, Plate tectonics and net lithosphere rotation over the past 150 My. Geophys. Res. Abs., 12, EGU Vienna 2010, 9036.
 51. **Torsvik, T.H.** Plumes, diamonds and climate. Earth Patterns and Processes -50 years with Bjørn Jamtveit. The Norwegian Academy of Science and letters, Oslo Norway 24 September (**Invited**).
 52. **Torsvik, T.H.**, Steinberger, B., Gurnis, M., **Gaina, C.**, Plate Tectonics and Net Lithosphere Rotation over the past 150 My. EGU, Vienna, May 2010 (**Invited**)
 53. **Torsvik, T.H.** Mantle Dynamics. Herdman Society Symposium 2010, Feb. 20th Liverpool University (**invited**)
 54. **Torsvik, T.H.** Diamonds sourced by plumes from the core-mantle boundary. Bristol University Seminar, March 2010 (**Invited**).
 55. **Torsvik, T.H.** Mantle Dynamics: Linking Surface and Deep processes. Voodoo Tectonics, Academy of Sciences, Oslo, 26-27 August 2010.
 56. Van der Voo, **Torsvik, T.H.** Geometric Signatures of Continental Movements During Supercontinent Assembly and Dispersal. AGU San Francisco, December 2010 (**Invited**).

57. van der Meer, D.G., Spakman, W., Van Hinsbergen, D.J., Amaru, M.L., **Torsvik, T.H.**, Towards absolute plate motions constrained by lower-mantle slab remnants. AGU San Francisco, December 2010.
58. **Watson, R.J., M.A. Smethurst**, V.C. Baranwal, J.S. Rønning. Hand-held gamma spectrometry for assessing radon risk from building materials. GammaSem, Kjeller, 28-29 September 2010.
59. **Watson, R.J.**, Boyden, J.A., Turner, M., Clark, J.A., Cannon, J.S., Lau, E., **Gaina, C.**, Gurnis, M., Müller, R.D., **Torsvik, T.H.**, GPlates - Interactive software for plate tectonic visualisation and modelling. 29th Nordic Winter Meeting, Oslo, 11-13 January 2010.

4. PUBLIC OUTREACH

1. **M. Ganerød**: Kommentar i NRK studio (P2) tidlig januar for å kommentere akselasjonen av den magnetiske nordpol. Direkte og landsdekkende.
2. **Torsvik, T.H.**, 16. Juli 2010, Intervju NRK Nyheter
3. <http://www.forskning.no/artikler/2010/juli/255873>
4. <http://news.sciencemag.org/sciencenow/2010/07/diamonds-may-unlock-secrets-of-h.html>
5. http://www.sciencedaily.com/releases/2010/07/100714141536.htm?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+sciencedaily+%28ScienceDaily%3A+Latest+Science+News%29
6. <http://esciencenews.com/articles/2010/07/14/scientists.work.improves.odds.finding.diamonds>
7. http://www.eurekalert.org/pub_releases/2010-07/uoh-swi071210.php
8. <http://www.physorg.com/news198326735.html>
9. http://www.labspaces.net/105082/Scientists__work_improves_odds_of_finding_diamonds
10. <http://engineering.library.cornell.edu/node/4585>
11. <http://1click.indiatimes.com/article/0fQd5Ht74c6M5?q=Norway>
12. <http://scienceblips.dailyradar.com/story/diamonds-sampled-by-plumes-from-the-core-mantle/>
13. <http://topics.pe.com/article/0fVefTzblu0qp?q=Africa>
14. <http://wrestling.msg.com/article/0fQd5Ht74c6M5?q=Norway>
15. http://www.researchsea.com/html/article.php/aid/5360/cid/1/research/the_evolution_of_police-like_institutions.html?PHPSESSID=rv1p15jh3nujb714048lkvesr5
16. <http://topics.philly.com/article/0fVefTzblu0qp?q=Africa>
17. http://pda.physorg.com/earthssurface-mantle-mantleplumes_news198326735.html
18. <http://www.spiegel.de/wissenschaft/natur/0,1518,706553,00.html>
19. <http://www.gfz-potsdam.de> (frontpage)
20. <http://www.scinexx.de/wissen-aktuell-11952-2010-07-15.html>