

GENERAL BACKGROUND

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| Nationality | French |
| Age | 43 (born in 1961) |
| Profession and present position | Seismic Hazard Specialist, Engineering Geologist, Deputy Director of Land Use Planning and Natural Risks Division |
| Languages | French, English, Spanish |
| Years of experience | 19, 8 with BRGM |

ACADEMIC BACKGROUND

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| 1990 | Ph.D. University of Paris, Structural Geology and Seismotectonics Thesis: "Mechanisms of recent deformations in Ecuadorian Andes". |
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PROFESSIONAL Background

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| 1985 | Research Engineer at Tectonics/Lithosphere Mechanics Laboratory at Institut de Physique du Globe de Paris |
| 1986 | Research Engineer for the French Power Board |
| 1986-1989 | Resident Research Engineer for the French Ministry of Foreign Affairs in Ecuador |
| 1988 | Research Engineer for the Department "TEGG" of the French Power Board |
| 1990-1996 | Seismic Hazard Specialist and Geologist at Coyne et Bellier (Engineering Consultants for hydropower projects) |
| 1997 | Project Manager, Seismic Hazard Specialist and Research Engineer at BRGM. |
| 1998-1999 | Head of Geomorphology and Remote Sensing Laboratory (20 Research Engineers) |
| 1999-2001 | Responsible of Research & Development for Land Use Planning and Natural Risks Department (45 Research Engineers) |
| Since 2001 | Deputy Director of Land Use Planning and Natural Risks Division (80 Research Engineers) |

SUMMARY OF QUALIFICATIONS AND EXPERIENCE

Dr. Th. Winter has over 15 years experience as a specialist in seismotectonics, seismic hazard, engineering geology. He has been involved in a large variety of major projects in more than 25 countries for more than 45 Dams and Catchment Schemes and more than a dozen of Oil and Gaz Field Development, Pipelines, Off-Shore Cables and Tunnels and gained an international reputation throughout the seismotectonics and seismic hazard community

As Research Engineer at Institut de Physique du Globe de Paris and then for the French Ministry of Foreign Affairs in Ecuador, as project engineer at COYNE ET BELLIER (Engineering Consultants for hydropower projects Project) and then as project manager, head of the Geomorphology and Remote Sensing Laboratory and then Deputy Director of Land Use Planning and Natural Risks Division at BRGM, he develops a comprehensive methodology for assessing seismic hazard based on the link between structural geology, seismicity and identification and characterization of active faulting. Recently, he focuses on active faulting and seismic hazard in intracontinental areas of widespread seismicity and slow rate deformations. He is member of the Scientific Board of the French Office of Seismology for the Research Ministry, Manager of (i) GéoFrance 3D national french research program on the Upper Rhine Graben, and (ii) various European Projects on active faulting and seismotectonics (SAFE, ENTEC, EUCOR-URGENT)

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| • MONTBEL dam, France, 1997 | Seismic Risk Expert |
| • RASSISSE dam, France, 1997 | Seismic Risk Expert |
| • CHIMAY dam, Peru, 1998 | Seismic Risk Expert |
| • POTRERILLOS dam, Argentina, 1998-1999 | Seismic Risk Expert |
| • WALLA dam, Jordan, 1998-1999 | Seismic Risk Expert |
| KARUN 4 dam, Iran, 2000 | Seismic Risk Expert |
| CHABROUGH dam, Lebanon, 2000 | Seismic Risk Expert |
| BOYABAT dam, Turkey, 2000 | Seismic Risk Expert |
| GAFARZA dam, Ethiopia, 2000 | Seismic Risk Expert |
| PEMBELIK dam, Turkey, 2000 | Seismic Risk Expert |
| ZIATINE dam, Tunisia, 2001 | Seismic Risk Expert |
| BAKTHIARY dam, Iran, 2001 | Seismic Risk Expert |
| POLOCHIC dam, Guatemala, 2002 | Seismic Risk Expert |
| TOABRE dam, Panama, 2002 | Seismic Risk Expert |
| GOTVAND dam, Iran, 2003 | Seismic Risk Expert |
| LANDISAQ dam, France, 2003 | Seismic Risk Expert |
| SEYMAREH dam, Iran, 2004-2005 | Seismic Risk Expert |
| El CIMARRON dam, El Salvador, 2004 | Seismic Risk Expert |
| FOUM EL GUEISS dam, Algeria, 2004 | Seismic Risk Expert |
| BABAR dam, Algeria, 2005 | Seismic Risk Expert |
| CHEFFIA dam, Algeria, 2005 | Seismic Risk Expert |
| GHERZA dam, Algeria, 2005 | Seismic Risk Expert |
| GHRIB dam, Algeria, 2005 | Seismic Risk Expert |
| ZARDEZAS dam, Algeria, 2005 | Seismic Risk Expert |
| KOUDIAT dam, Algeria, 2005 | Seismic Risk Expert |
| MAZAR dam, Ecuador, 2005 | Seismic Risk Expert |
| ... BEHESTABAT dam, Iran, 2005 | Seismic Risk Expert |

Oil and Gaz Field Development, Pipelines, Off-Shore Cables, Locks and Tunnels :

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| • YADANA field, Myanmar, 1994 | Seismic Risk Specialist |
| • YADANA-ONBINGWIN pipelines, Myanmar, 1994 | Seismic Risk Specialist |
| • JOSE Chemical Complex, Venezuela, 1994-1995 | Seismic Risk Specialist |
| • YETAGUN Field, Myanmar, 1995 | Seismic Risk Specialist |
| • YETAGUN-TAVOY Pipelines, Myanmar, 1995 | Seismic Risk Specialist |
| • AQABA Gulf cable crossing, Jordan-Egypt, 1995 | Seismic Risk Specialist |
| • VILLAVICENCIO tunnels, Colombia, 1995 | Seismic Risk Specialist |
| • TUNU field, Eastern Kalimantan, 1995 | Seismic Risk Specialist |
| • YEMEN field and pipelines, Yémen, 1995 | Seismic Risk Specialist |
| • SIRRI field, Iran, 1995 | Seismic Risk Specialist |
| • YEMEN LNG, Yemen, 1995 | Seismic Risk Specialist |
| • ESPADARTE-VALEIRA field, Angola, 1997 | Seismic Risk Expert |
| • SOUTH PARS gas field (onshore & offshore facilities), Iran, 1997-1998 | Seismic Risk Expert |
| • 3IN1 Pipeline (onshore & offshore route), Myanmar, 1998 | Seismic Risk Expert |
| TROMBLAY LNG, India 1998 | Seismic Risk Expert |
| • NORTH-EAST MARCHES, Gaz de France Pipeline, France, 1998 | Seismic Risk Expert |
| • POST-PANAMAX LOCKS, Panama, 2002-2005 | Seismic Risk Expert |
| BEHESTABAT-ZAYANDEHRUD Tunnel, Iran, 2005 | Seismic Risk Expert |

INSTITUTIONAL REPRESENTATION:

Coordinator of the Research program of BRGM on Seismotectonics, 2001-2003
Co-coordinator of the GéoFrance 3D national french research program, 1998-2000
Task Leader of a European Research Programs (SAFE, ENTEC, EUCOR-URGENT), 1998-2003
Member of the Scientific Board of the French Office of Seismology for the Research Ministry, 1998-2000
Member of the French Association of Earthquake Engineering (AFPS) and of the French Committee of Engineering Geology (CFGI)
Reviewer for Tectonophysics, Earth and Planetary Science Letters, Geotechnical and Geological Engineering, Engineering Geology, Geological French Society Bulletin, Quaternary Research Sciences,

RELEVANT PUBLICATIONS :

- Brüstle.A., Nivière.B., Bertrand.G., Gourry.J.C., Carretier.S., Fracassi.U., Winter.T. (2003) Evidences of pleistocene tectonic deformations along the se border of the upper Rhine graben (Freiburg area, Germany), in EGS - AGU - EUG joint Assembly - Nice - France - 06-11/04/2003 [Paru]
- Carretier.S., Nivière.B., Winter.T. (2003) Geomorphological transient signature of a ramp activation in a low relief and temperate climatic context: example of the Sundgau, Upper Rhin Graben, Fance., in EGS - AGU - EUG joint Assembly - Nice - France - 06-11/04/2003 [Paru]
- Fracassi.U., Nivière.B., Winter.T. (2003) First appraisal to define potential seismogenic sources from macroseismic fields in southern upper Rhine graben, W France., in EGS - AGU - EUG joint Assembly - Nice - France - 06-11/04/2003 [Paru]
- Innocent.C., Nivière.B., Winter.T., Lemeille.F. (2003) Potentialities and limitations of U-Th dating of continental carbonates: shells and concretions from the french Rhône Valley (Alsace), in EGS - AGU - EUG joint Assembly - Nice - France - 06-11/04/2003 [Paru]
- Sabourault.P., Winter.T., Lambert.J., Nicolas.M. (2003) Revisiting the 1356 basel earthquake : new constraints on eismogenic source derived from historical damages and site effect ponderation., in EGS - AGU - EUG joint Assembly - Nice - France - 06-11/04/2003 [Paru]
- Sebrier.M., Atakan.K., Camelbeeck.T., Valensise.G., Winter.T. (2003) Active faulting in low-to moderate seismicity regions : the safe european project., in EGS - AGU - EUG joint Assembly - Nice - France - 06-11/04/2003 [Paru]
- Innocent.C., Nivière.B., Winter.T., Lemeille.F., Cushing.P. (2002) U-Th dating of Quaternary formations in a seismically active area: an example the French Rhone Valley (Alsace), in EGS 26th - European Geophysical Society - Nice - France - 25-30/03/2001 [Paru]
- Sebrier.M., Siame.L., Winter.T., Nivière.B., Morel.J.L., Zouine.E., El.Mouraouah.A., Lebatard.A.E. (2002) Compressive deformation in low-seismicity region: the western high Atlas Morocco., Environnement et Gestion des sols [Soumis]
- Moreno.B., Atakan.K., Sebrier.M., Gianluca.V., Camelbeeck.T., Winter.T. (2002) Safe-T: a software tool for diagnosing slow active faults in Europe., in European Seismological Commission - Genova - Italy - 01-06/09/2002 [Paru]
- Nivière.B., Winter.T., Giamboni.M. (2000) Kinematic evolution of a tectonic wedge above a flat-lying decollement: the Alpine foreland at the interface between Jura mountains (N Alps) and south of the Upper Rhine Graben., Geology [Soumis].
- Giamboni.M., Wetzel.A., Nivière.B., Winter.T. (2001) The Rhine river capture in the southern upper Rhine graben during plio-pleistocene: local folding versus regional subsidence., in Stephan Mueller topical conference of the European Geophysical Society - Quantitative neotectonics and seismic hazard assesment: new intergrated approaches for environmental management - Balatonfüred - Hongrie - 22-26/09/2001 [Paru]
- Nivière.B., Winter.T. (2001) On going kinematic development of a tectonic wedge: the northern Juara front a south of the upper Rhine graben., in Environmental management. Quantitative neotectonics and seismic hazard assessment - 22-26/09/2001 - Balatonfüred - Hungary - 22/01/1998, P. 45-46 [Paru]

- Nivière.B., Winter.T. (2001) Topography affected by an going slow tectonic activity in the upper Rhine graben, France., in Eucor urgent workshop - 2nd - Mont Saint Odile - Strasbourg - France - 07-11/10/2001 [Paru]
- Nivière.B., Winter.T. (2001) Coupling of high resolution electromagnetic and electrical methods for slow active fault detection in temperate environment (Southern Rhine Graben, France)., in Stephan Mueller topical conference of the European Geophysical Society - Quantitative neotectonics and seismic hazard assesment: new intergrated approaches for environmental management - Balatonfüred - Hongrie - 22-26/09/2001 [Paru]
- Nivière.B., Winter.T. (2001) Pleistocene northward fold propagation of Jura within the southern Upper Rhine Graben: rates estimates., in ENTEC Workshop - Amesterdam - Pays-Bas - 04/2001 [Paru]
- Nivière.B., Winter.T. (2001) Mechanisms and rate estimates of a tectonic wedge accretion: the example of the Southern Upper Rhine graben (France)., in Stephan Mueller topical conference of the European Geophysical Society - Quantitative neotectonics and seismic hazard assesment: new intergrated approaches for environmental management - Balatonfüred - Hongrie - 22-26/09/2001 [Paru]
- Siame.L., Bellier.O., Boulès.D.L., Braucher.R., Baroux.E., Beaudouin.T., Cushing.M., Winter.T., Raisbeck.G.M., Yyou.F. (2001) Active tectonics and cosmic ray exposure dating: arid, temperate and tropical environments., in Journées prospectives Spectrométrie de Masse par Accélérateur [Soumis]
- Siame.L., Bellier.O., Boulès.D., Braucher.R., Baroux.E., Beaudouin.T., Cushing.T., Winter.T., Raisbeck.G.M., Yyou.F. (2001) Active tectonics and cosmic ray exposure dating: arid, temperate and tropical environments., in Journées prospectives Spectrométrie de masse par accélérateur - 26-27/11/2001 [Paru]
- Nivière.B., Winter.T. (2000) Pleistocene northward fold propagation of Jura within the southern Upper Rhine Graben. Seismotectonic implications., *Global and Planetary Changes*, Vol. 27, n° 1-4, p. 263-288 [Paru]
- Nivière.B., Winter.T. (2000) Northwards fold propagation of the Jura within the southern Upper Rhine graben. Seismotectonic consequences., in Eucor-urgent annual scientific workshop - 1est - Fachschaftshaus am Schauinsland - University of Freiburg i. Br. - Germany - 10-13/07/2000, *Global and Planetary Changes*, N° 27, p. 263-288 [Paru]
- Nivière.B., Winter.T. (2000) Pleistocene Northward Fold Propagation of Jura within the Southern Upper Rhine Graben. Seismotectonic implication., in AGU - San Francisco - USA - 15-19/12/2000, F1167, Vol. 81, n° 48 [Paru]
- Nivière.B., Winter.T. (2000) Pleistocene Northward Fold Propagation of Jura within the Southern upper Rhine Graben. Seismotectonic Implications., in Eucor-urgent annual scientific workshop - 1est - Fachschaftshaus am Schauinsland - University of Freiburg i. Br. - Germany - 10-13/07/2000 [Paru]
- Nivière.B., Winter.T., Giamboni.M. (2000) Geomorphic response to a tectonic forcing in a slowly erosive environment (Southern Upper Rhine graben)., in EGS 25th - European Geophysical Society - Nice - France - 25-29/04/2000, *Annales Geophysicae*, Suppl. 1 to vol. 16 [Paru]
- Nivière.B., Winter.T., Giamboni.M. (2000) Propagation pléistocène des plis du Jura au sud du fossé rhénan supérieur, implications sismotectoniques., in RST 2000 - 18ème Réunion Annuelle des Sciences de la Terre - Paris - France - 17-20/04/2000, p. 204 [Paru]
- Lenotre.N., Winter.T. (1999) Quaternary deposits (terraces of the Seille river, Jura, France) as recorders of glacial rebound and tectonics., in EUG 10 - European Union of Geosciences - Strasbourg - France - 28/03-01/04/1999 [Paru]
- Winter.T., Nivière.B. (1999) On going propagation of the Jura fold belt to Mulhouse., in GéoFrance 3D - résultats et perspectives - ENS - Lyon - France - 23-24/11/1999, Documents BRGM, Orléans : Editions BRGM, N° 293, p.125-128 [Paru]
- Gourry.J.C., Guérin.R., Albouy L., Winter.T. (1998) Alluvial terraces geometry in French Jura estimated from DC electric and TDEM measurements., in EEGS 4th - Environmental and Engineering Geophysical Society - European Section - Barcelona - Spain - 14-17/09/1998, p. 639-642 [Paru]
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- Lavenu A., Winter Th. & Davilla F., 1994. Recent to Present tectonic evolution of the Ecuadorian Andes: a Plio-Quaternary compressional basin in the Interandean Depression. *Geophys. J. Int.*, 121, 279-300.
- Winter Th., Tapponnier P. & Armijo R., 1994. On the merits of a deterministic approach to seismic risk for dam design. *Proceedings of the 7th Congress of the International Association of Engineering Geology*, Lisboa, September, V.3, 2007-2016.
- Winter Th., Binquet J., Szendroi A., Colombet G., Armijo R. & Tapponnier P. 1994. From plate tectonics to the design of the Dul Hasti hydroelectric project in Kashmir (India). *Engineering Geol.*, 36, 211-241.

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- Phan Trong T., Nguyen Trong Y., Nguyen H., Lacassin R., Tapponnier P., Leloup H. & Winter Th., 1994. Active faulting and tectonics of North Vietnam. International Workshop on Seismic Hazard in SE Asia, Hanoi, Vietnam.
- Winter Th., Phan Trong T., Lacassin R., Nguyen Trong Y. & Costaz J., 1994. Advantages of a deterministic approach of seismic risk for dam design: the Hoa Binh Dam case (Vietnam). Proceedings of the International Workshop on Seismic Hazard in SE Asia, Hanoi, Vietnam, 249-254.
- Winter Th., Avouac J.P. & Lavenu A., 1993. Late Quaternary kinematics of the Pallatanga strike-slip fault (Central Ecuador) from topographic measurements of displaced morphologic features. *Geophys. J. Int.*, 115, 905-920.
- Winter Th., Avouac J.P. & Lavenu A., 1993. Holocene kinematics of the Pallatanga strike-slip fault (Central Ecuador) from topographic measurements of displaced morphologic features. Workshop "Mesure de la déformation récente et actuelle", p 48, Chambéry, France.
- Lavenu A., Ego F., Noblet C. & Winter Th., 1993. Neogene to Present tectonic evolution and stress field in Ecuador. International Symposium Andean Geodynamics, Ed. ORSTOM, p 211, Oxford, United Kingdom.
- Marocco R. & Winter Th., 1993. Bosquejo de la evolucion geodinamica del Ecuador. Chapitre 5 de l'ouvrage de Winckell A.: "Paisajes Naturales del Ecuador". Geographica Basica del Ecuador, Ed. ORSTOM.
- Winter Th. & Tapponnier P., 1991. Extension majeure post-Jurassique et ante-Miocène dans le centre de l'Italie : données microtectoniques. *Bull. Soc. Géol. France*, 162, 6, 1095-1108.
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- Lavenu A., Noblet Ch. & Winter Th., 1990. Neogene stress pattern in Southern Ecuador. Symposium International "Geodinamica Andina", Ed. ORSTOM, p 211, Grenoble, France.
- Winter Th., Iglesias R. & Lavenu A., 1990. Presencia de una falla normal activa en el Sur del Ecuador. *Bol. Geol. Ecuat.*, 1, 1, 53-67.
- Winter Th., 1990. Mécanismes des déformations récentes dans les Andes Equatoriennes. Thèse de Doctorat, Université de Paris Sud-Orsay.
- Lavenu A., Winter Th. & Avouac J.P., 1990. Premiers résultats des études de failles actives dans les Andes de l'Equateur. Symposium International "Geodinamica Andina", Ed. ORSTOM, p 115, Grenoble, France.
- Winter Th. & Lavenu A., 1989. Tectonique active en Equateur : Ebauche d'une nouvelle interprétation géodynamique. *Bull. Inst. Fr. Et. And.*, 18, 95-115.
- Winter Th. & Lavenu A., 1989. Morphological and microtectonic evidence for a major active right-lateral strike-slip fault across Central Ecuador (South America). *Annales Tectonicae*, III, 123-139.
- Winter Th. & Lavenu A., 1988. Evidencias morfológicas y microtectónicas de una falla de rumbo activa en el centro del Ecuador. 5ème Congrès Equatorien de Géol., Min., Petr. et Scien. Af., Loja, Equateur.
- Tapponnier P., Tortorici L. & Winter Th., 1986. Faulting during the 1783, Southern Calabria earthquakes and active tectonics of the Messina strait region. *E.O.S.*, 67, 44, P12A10.
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