CURRICULUM VITAE—Octobert 2016

Roger del Moral— Professor of Biology (*Emeritus*)

BORN September 13, 1943

EDUCATION
1968, Ph. D., Biology, U. C. Santa Barbara
1966, M. A., Botany, U. C. Santa Barbara
1965, B. A., Botany/Environmental Biology, U. C. Santa Barbara

EMPLOYMENT
1968-2014 ***University of Washington*; Departments of Botany and of Biology**
2014→ to date Professor of Biology, *Emeritus*

PROFESSIONAL EXPERIENCE

2016	Spain (landscapes: Cataluña, Andalucía, Basque lands, Pyrenees) France (landscapes: Roussillon)
2014	Greece (succession: Santorini; landscapes: Crete; Thessaloniki)
2013	Iceland (volcanic areas: Hekla; Heimaey; glacial forelands: south Iceland) France (wetlands: Loire; restoration: Aquitaine)
2012	Czech Republic (mine tailings: Bohemia, Sicilia) Galapagos Islands (evolution)
2011	France (landscapes: Burgundy, Rhone Valley, Corsica)
2010	Hawaii (volcano succession: Kilauea, Mauna Loa; rain forests: Hilo)
2008	Italy (landscapes: Ravenna, Dolomites, Liguria coast; Po Valley: wetlands)
2007	Iceland (soil erosion: Reykjanes Peninsula; primary succession: Surtsey; lava and outwash plains; Vatnajökull National Park) Turkey (soil erosion: Antalya, Pamukkale)
2006	Croatia (restoration: Dubrovnik; dunes: Trogir)
2005	Austria (urban restoration: Vienna)
2004	Hawaii (primary succession on lava: Kona Coast), Queensland (dunes: Fraser Island; rainforests: Lamington), New Zealand (volcano succession: Tarawera, Mt. Taranaki)
2003	Italy (urban succession, derelict sites: Rome)
2002	Iceland (volcanoes, geysers: Thingvellir)
2001	Sabbatical: Sicily (succession: Mt. Etna, Vulcano, Stromboli)
1999	Russian Far East (primary succession: Kamchatka Peninsula [Mt. Tolbachik])
1998	Ireland and Sweden (landscapes)
1995	Sabbatical: North Carolina (U. North Carolina: multivariate and sampling methods)
1994	Russian Far East (primary succession: Kamchatka Peninsula [Mt. Ksudach])
1991	Hungary (landscapes: Budapest, Eger), Japan (volcanic landscapes: Fuji City)
1990	Japan (landscapes, volcanic succession: Fuji, Yokohama, Fukuoka)
1985	Sabbatical: Japan (volcanic landscapes including these volcanoes: Fuji, Sakurajima, Usu, Bandai, Unsen, Asama)

1984	Sabbatical: England (Research Fellow studying restoration methods: University of East Angela; University of Liverpool; Manchester University, University of York) France (succession, wetlands: Normandy, Brittainy, Dordogne, Provence, Camargue)
1980-2013	Mount St. Helens: succession research
1979	The Netherlands (dunes: Nijmegen); Germany (landscapes: Rhine Valley); England (restoration: Oxford)
1978-1983	Studies of Competition, Olympic National Park
1977	S.E. Alaska (succession: Juneau; wetlands: Wrangle, Petersburg) Sabbatical: Melbourne, Australia (Research Fellow, allelopathy)
1976	Sabbatical: Brisbane, Australia (Research Fellow, classification methods and allelopathy)
1975	Tadzhikistan (vegetation patterns)
1972	Holland, France, Spain, England, Scotland, Wales (vegetation patterns) Alaska (succession: Nome, Anchorage)
1969-1979	Western Washington (vegetation patterns)
1968	Ph.D., Biology, U.C. Santa Barbara
1966	M.A., Botany, U.C. Santa Barbara
1965-1968	N.D.E.A. Fellowship
1965	B.A., Botany/Environmental Biology, U.C. Santa Barbara

RESEARCH INTERESTS

My interests may be broadly as falling under *Plant community ecology*. I have always sought to explain the causes of observed vegetation patterns, sometimes by experiment, but often by careful observations that constitute natural experiments. Initially, I focused on the causes of local vegetation patterns that were found to involve chemical inhibition. Later, I became interested in describing larger scale vegetation patterns with the developing array of multivariate methods. This led to interests in competitive effects that altered species patterns based on what species were capable of achieving. When Mount St. Helens erupted, this forced a major shift in my career trajectory. Because I was adept at ecological fieldwork and knew the vegetation of high elevation sites, I was naturally attracted to documenting the recovery of vegetation on this volcano. Seeing how landscapes could recover from even profound devastation fueled my interests in restoration, and I led the development of the use of natural processes to improve restoration practices. Along the way, I developed expertise in wetland ecology, particularly in rehabilitation and restoration and in the ecology of derelict, weedy habitats. I am best known for producing the longest continuous monitoring study of volcanic vegetation and over 50 publications about Mount St. Helens that explore many aspects of plant succession.

WEB SITES

Please see my web site for more details about research and related web sites. http://faculty.washington.edu/moral/

Major GRANTS & CONTRACTS

2010-2013	***NSF OPUS***: Synthesis of Mount St. Helens research
1989-2010	***NSF LTREB***: Primary Succession on Mount St. Helens.
1995-96	***National Geographic Society***: Primary Succession: Volcanoes Bezymianny, Tolbachik & Shiveluch.
1994	***National Geographic Society:*** Succession on Lateral Blast Deposits on Ksudach Volcano ($23K).
1981-1987	***NSF***: Ecosystem development on perturbed sites on Mount St. Helens ($90K). Continuing studies of succession and populations of subalpine communities.
1982-1984	***NSF***: Control of diversity in subalpine plant communities ($55K). Integrated studies of competition, grazing, disturbance and heterogeneity as they affect vegetation structure.
1980	***NSF***: Mount St. Helens Mud and Ash study ($14K emergency grant). Growth characteristics of new materials, preliminary surveys of survival of subalpine vegetation.
1978-1981	***NSF***: Competition in stable alpine meadows ($60K). Experimental studies of the importance of competition ***along*** gradients of stress and production.
1970-1972	***NSF***: Comparative ecology of *Abies* ($40K). Distributions and environmental response of closely related species were investigated in efforts to determine mechanisms that permit coexistence.

REFEREED PUBLICATIONS *(Nationality of author if not USA; * = invited paper)* (Selected)

Prach, K. (CZ) & R. del Moral. 2015. Passive restoration is often quite effective: response to Zahawi *et al*. (2014). *Restoration Ecology* 23: 344-346.

del Moral, R. & Cynthia C. Chang. 2015. Multiple assessments of succession rates on Mount St. Helens. *Plant Ecology* **216**: 165-176. DOI 10 1007/s11258-014-0425-9;.

*Walker, L.R., N. Hölzel (D), R. Marrs (ENG), R. del Moral & K. Prach (CZ). 2014. Optimization of intervention levels in ecological restoration. *Applied Vegetation Science* **17**: 187-192.

*del Moral, R. & B. Magnusson (IS). 2014. Mount St. Helens and Surtsey: a comparison of early succession rates. *Biogeosciences* **11**: 2099-2111.

Marler, T.E. & R. del Moral. 2013. Primary succession in Mount Pinatubo: habitat availability and ordination analysis. *Communicative & Integrative Biology 6:e25924; http://dxdoi.org/10.4161/cib.25924*

del Moral, R. 2012. Thirty years of permanent vegetation plots, Mount St. Helens, Washington. *Biodiversity and Ecology* **4**: 434. http://www.ou.edu/cas/botany-micro/ben/ben453.html

*del Moral, R. Thirty years of primary succession on Mount St. Helens. Feature paper in BEN #453 (Botanical Electronic Newsletter), available at: http://www.ou.edu/cas/botany-micro/ben/ben453.html

del Moral, R. & D.M. Wood. 2012. Vegetation development on permanently established grids, Mount St. Helens (1986-2010). *Ecology* **93**: 2125. *Ecological Archives* E093-201. http://dx.doi.org/10.1890/12-0344.1

del Moral, R., Lindsey A. Thomason, A.C. Wenke, Natasha Lozanoff & M.D. Abata. 2012. Primary succession trajectories on pumice at Mount St. Helens, Washington. *Journal of Vegetation Science* **23**: 73-85.

Marler, T.E. & R. del Moral. 2011. Primary succession along an elevation gradient 15 years after the eruption of Mount Pinatubo, Luzon, Philippines. *Pacific Science* **65**: 157-173.

*del Moral, R. 2010. The importance of long-term studies of recovery after the eruption of Kasatochi Island. *Arctic, Antarctic and Alpine Research* **42**: 335-341.

del Moral, R. 2010. Thirty years of permanent vegetation plots, Mount St. Helens, Washington (Data Paper). *Ecology* **91**: 2185. *Ecological Archives* E-091-152. http://onlinelibrary.wiley.com/doi/10.1890/09-2357.1/epdf

*del Moral, R. 2010c. Lessons for restoration of protected lands. (Based on seminar at XVIIth Botanical Congress, 2005). *Bran-Blanquetia* **46**: 217-223.

del Moral, R., J.M. Saura & Jennifer N. Emenegger. 2010. Primary succession trajectories on a barren plain, Mount St. Helens, Washington. *Journal of Vegetation Science* **21**: 857-867.

*del Moral, R. & L.R Walker. 2010. (Greek translation of 2007. *Environmental Disasters, Natural* Recovery and Human Response. Cambridge: Cambridge University Press.)'ΠΕΡΙΒΑΛΛΟΝΤΙΚΕΣ ΚΑΤΑΣΤΡΟΦΕΣ, ΦΥΣΙΚΗ ΑΝΑΓΕΝΝΗΣΗ ΚΑΙ ΑΝΘΡΩΠΙΝΗ ΑΝΤΑΠΟΚΡΙΣΗ' (translated by Eleni Kalfaki).

del Moral, R. 2009. Increasing deterministic control of primary succession on Mount St. Helens, Washington. *Journal of Vegetation Science* **20**: 1145-1154.

*del Moral, R. 2009. Primary succession on Mount St. Helens, with reference to Surtsey. *Surtsey Research* **12**: 151-155.

Jones, C.C. & R. del Moral. 2009. Dispersal and establishment both limit colonization during primary succession on a glacier foreland. *Plant Ecology* **204**: 217-230.

del Moral, R., J.E. Sandler & Claire P. Muerdter. 2009. Spatial factors affect primary succession on the Muddy River Lahar, Mount St. Helens, Washington. *Plant Ecology* **202**: 177-190.

*Walker, L.R. & R. del Moral. 2009. Transition dynamics in succession: implications for rates, trajectories, and restoration. Chapter 3 (pp 33-49) in R.H. Hobbs & K.N. Suding (eds.) *New Models for Ecosystem Dynamics and Restoration*. Washington DC: Island Press.

*Walker, L.R. & R. del Moral. 2009. Lessons from primary succession for restoration of severely damaged habitats. *Applied Vegetation Science* **12**: 55-67.

Carey, Susan, A, Ostling, J. Harte & R. del Moral. 2007. Impact of curve construction and community dynamics on the species-time relationship. *Ecology* **88**: 2145-2153. See also Ecological Archives: E088-128-A1 to A3.

del Moral, R. & L.R. Walker. 2007. *Environmental Disasters, Natural Recovery and Human Response*. Cambridge: Cambridge University Press.

*del Moral, R. 2007. Limits to convergence of vegetation during early primary succession. *Journal of Vegetation Science*. **18**: 479-488 (with cover photo).

*Walker, L.R., J. Walker (AUS) & R. del Moral. 2007. Forging a New Alliance between Succession and Restoration. Chapter 1 *in* L.R Walker, J. Walker & R.H. Hobbs, *Linking Restoration and Succession in Theory and in Practice*. New York: Springer.

*del Moral, R., L.R. Walker & J.P. Bakker (NL). 2007. Insights gained from succession for the restoration of structure and function. Chapter 2 in L.R. Walker, J. Walker & R.H. Hobbs, *Linking Restoration and Succession in Theory and in Practice*. New York: Springer.

Carey, Susan, J. Harte & R. del Moral. 2006. Effect of community assembly and primary succession on the species-area relationship in disturbed systems. *Ecography* **29**: 866-872.

del Moral, R. & Iara L. Lacher. 2005. Vegetation patterns 25 years after the eruption of Mount St. Helens, Washington. *American Journal of Botany* **92**: 1948-1956.

del Moral, R. & Lara Rozzell. 2005. Effects of lupines on community structure and species association. *Plant Ecology* **180**: 203-215.

Jones, C.C. & R. del Moral. 2005a. Patterns of primary succession on the foreland of Coleman Glacier, Washington, USA. *Plant Ecology* **180**: 105-116

Jones, C.C. & R. del Moral. 2005b. Effects of microsite conditions on seedling establishment on the foreland of Coleman Glacier, Washington. *Journal of Vegetation Science* **16**: 293-300.

del Moral, R. & A.J. Eckert. 2005. Colonization of volcanic deserts from productive patches. *American Journal of Botany* **92**: 27-36.

del Moral, R., D.M. Wood & J.H. Titus. 2005. How landscape factors affect recovery of vegetation on barren surfaces. Chapter 7 in *Ecological Responses to the 1980 Erupton of Mount St. Helens* (V.H. Dale, F. Swanson & C.M. Crisafulli, eds). Pp. 93-109. Springer

del Moral, R. & Erin E. Ellis. 2004. Gradients in heterogeneity and structure on lahars, Mount St. Helens, Washington, USA. *Plant Ecology* **175**: 273-286.

Davis, M, J. Pergl (CZ), Anne-Marie Truscot (Scot), J. Bakker (NL), K. Prach (CZ), Anne-Helene Prieur-Richard (F), R. Veeneklaas (NL), P. Pyŝek (CZ), R. del Moral, R. Hobbs (AUS), S. Collins, S.T.A. Pickett & P.B. Reich (DK). 2005. Vegetation change: a reunifying concept in plant ecology. *Perspectives in Plant Ecology, Evolution & Systematics* **7**: 69-76.

del Moral, R. 2004. How *Lupinus lepidus* affects primary succession on Mount St. Helens. Pp. 208-215 *in* E. van Santen (ed.), *Wild and Cultivated Lupines from the Tropics to the Poles*. Proc. 10th Inter. Lupin Conference, Laugarvatn, Iceland, 19-24 June 2002. International Lupin Association, Canterbury, New Zealand.

Walker, L.R. & R. del Moral. 2003. *Primary succession and ecosystem rehabilitation*. Cambridge University Press, Cambridge, UK.

Fuller, R.N. & R. del Moral. 2003. The role of refugia and dispersal in primary succession on Mount St. Helens, Washington. *Journal of Vegetation Science* **14**: 637-644.

del Moral, R. & C.C. Jones. 2002. Early spatial development of vegetation on pumice at Mount St. Helens. *Plant Ecology* **162**: 9-22.

Odland, A. (N) & R. del Moral. 2002. Primary succession on newly revealed lake shores. *Plant Ecology* **162**: 185-198.

*Walker, L.R. & R. del Moral. 2001. *Primary succession*. Encyclopedia of Life Sciences. MacMillan Publishers, London.

*del Moral, R. 2000a. Succession and local species turnover on Mount St. Helens, Washington. *Acta Phytogeographica Suecica* **85**: 53-62.

del Moral, R. 1999. Plant succession on pumice at Mount St. Helens. *American Midland Naturalist* **141**: 101-114.

*del Moral, R. & S. Yu. Grishin (RUS). 1999. The consequences of volcanic eruptions. *In* L.R. Walker (ed.), *Ecosystems of Disturbed Ground*, Ch. 5; *Ecosystems of the World Series* (D.W. Goodall (Ed.-in-Chief), Elsevier Science, Amsterdam.

Dlugosch, Katrina & R. del Moral. 1999. Vegetational heterogeneity along environmental gradients. *Northwest Science* **43**: 12-18.

del Moral, R. 1998. Early succession on lahars spawned by Mount St. Helens. *American Journal of Botany* **85**: 820-828.

Titus, J.H. & R. del Moral. 1998a. Vesicular-arbuscular mycorrhizae influence Mount St. Helens pioneer species in greenhouse experiments. *Oikos* **81**: 495-510.

Titus, J.H. & R. del Moral. 1998b. Seedling establishment in different microsites on Mount St. Helens, Washington, USA. *Plant Ecology* **134**: 13-26.

Titus, J.H. & R. del Moral. 1998c. The role of mycorrhizae in primary succession on Mount St. Helens. *American Journal of Botany* **85**: 370-375.

Tsuyuzaki, S. (J), J.H. Titus & R. del Moral. 1997. Seedling establishment patterns on the Pumice Plain, Mount St. Helens, Washington. *Journal of Vegetation Science* **8**: 727-734.

*Inderjit (IND) & R. del Moral. 1997. Is separating resource competition from allelopathy realistic? *Botanical Reviews* **63**: 221-230.

Grishin, S. Yu., R. del Moral, P.V. Krestov & Valentina P. Verkholat. 1996. Succession following the catastrophic eruption of Ksudach volcano (Kamchatka, 1907). *Vegetatio* **127**: 129-153. (All RUS).

del Moral, R., J.H. Titus & Arlene M. Cook (AUS). 1995. Early primary succession on Mount St. Helens, USA. *Journal of Vegetation Science* **6**: 107-120.

Tsuyuzaki, S. (J) & R. del Moral. 1995. Species attributes in early primary succession on volcanoes. *Journal of Vegetation Science* **6**: 517-522.

Tsuyuzaki, S. (J) & R. del Moral. 1994. Canonical correspondence analysis of early succession on Mount Uzu, Hokkaido. *Ecological Research* **9**: 143-150.

*del Moral, R. 1993. Mechanisms of early succession on Mount St. Helens. P. 79-100, in, J. Milne and D.W.H. Walton (eds), *Primary Succession on Land*, Blackwell, London.

del Moral, R. & D.M. Wood. 1993. Early primary succession on a barren volcanic plain at Mount St. Helens, Washington. *American Journal of Botany* **80**: 981-991.

*del Moral, R. & L.C. Bliss. 1993. Mechanism of primary succession: Insights resulting from the eruption of Mount St. Helens. *Advances in Ecological Research* **24**: 1-66.

del Moral, R. & D.M. Wood. 1993. Understanding dynamics of early succession on Mount St. Helens. *Journal of Vegetation Science* **4**: 223-234.

del Moral, R. & D.M. Wood. 1988. Dynamics of herbaceous vegetation recovery on Mount St. Helens, Washington, USA, after a volcanic eruption. *Vegetatio* **47**: 11-27.

Wood, D.M. & R del Moral. 1988. Colonizing plants on the Pumice Plains, Mount St. Helens, Washington. *American Journal of Botany* **75**:1228-1237.

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del Moral, R. 1985. Competitive effects on the structure of subalpine meadow communities. *Canadian Journal of Botany* **63**: 1444-1452.

del Moral, R. & C.A. Clampitt. 1985. Growth of native plant species on recent volcanic substrates from Mount St. Helens. *American Midland Naturalist* **114**: 374-383.

del Moral, R., C.A. Clampitt & D.M. Wood. 1985. Does interference cause niche differentiation? Evidence from subalpine plant communities. *American Journal of Botany* **72**:1891-1901.

del Moral, R. 1984. The impact of the Olympic marmot on subalpine vegetation structure. *American Journal of Botany* **71***:* 1228-1236.

del Moral, R. 1983.Vegetation ordination of subalpine meadows using adaptive strategies. *Canadian Journal of Botany* **61**: 3117-3127.

del Moral, R. 1983. Competition as a control mechanism in subalpine meadows. *American Journal of Botany* **70**: 232-245.

Belsky, Arlene Joy & R. del Moral. 1982. Ecology of an alpine-subalpine meadow complex in the Olympic Mountains. *Canadian Journal of Botany* **60**: 778-788.

del Moral, R. 1982. Control of herb vegetation on contrasting substrates: herb pattern on serpentine and sandstone. *American Journal of Botany* **69**: 227-238.

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del Moral, R. 1979. High elevation vegetation of the Enchantment Lakes Basin. *Canadian Journal of Botany* **57**: 1111-1130.

del Moral, R. & A.F. Watson. 1978. Gradient structure of forest vegetation in the central Washington Cascades. *Vegetatio* **38**: 29-49.

del Moral, R., R.J. Willis (CAN) & D.H. Ashton (AUS). 1978. Suppression of coastal heath vegetation by *Eucalyptus baxteri*. *Australian Journal of Botany* **16**: 102-119.

del Moral, R. & J.N. Long. 1977. Classification of montane forest community types in the Cedar River drainage of Western Washington, U.S.A. *Canadian Journal of Forest Research* **7**: 217- 225.

Bell, D.T. & R. del Moral. 1977. Vegetation gradients in the streamside forest of Hickory Creek, Will County, Illinois. *Bulletin Torrey Botanical Club* **104**: 127-135.

Lebednick, Gretchen & R. del Moral. 1976. Vegetation surrounding Kings Lake Bog, Washington. *Madroño* **23**: 386-400.

del Moral, R. & D.C. Deardorff. 1976. Vegetation of the Mima Mounds, Washington State. *Ecology* **57**: 520-530.

del Moral, R. 1974. Species patterns in the upper Teanaway River drainage, Wenatchee Mountains, Washington. *Syesis* **7**: 13-30.

del Moral, R. 1972. On the variability of chlorogenic acid concentration. *Oecologia* **9:** 289-300.

del Moral, R. 1972. Diversity patterns in forest vegetation of the Wenatchee Mountains, Washington. *Bulletin Torrey Botanical Club* **99**: 57-64.

del Moral, R. & R.G. Cates. 1971. The allelopathic potential of vegetation of western Washington. *Ecology* **52**: 1030-1037.

Muller, C.H. & R. del Moral. 1971. Role of animals in suppression of herbs by shrubs. *Science* **173**: 462-463.

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del Moral, R. & C.H. Muller. 1969. Fog-drip: a mechanism of toxin transport from *Eucalyptus globulus*. *Bulletin Torrey Botanical Club* **96**: 467-475.

Muller, C.H. & R. del Moral. 1966. Soil toxicity induced by terpenes from *Salvia leucophylla*. *Bulletin Torrey Botanical Club* **93**: 130-137.