

**Donald E. Sabol Jr.**  
**BIOGRAPHICAL SKETCH**

---

**Donald E. Sabol**

Division of Earth & Ecosystems Science  
Desert Research Institute  
2215 Raggio Parkway  
Reno, Nevada 89512

Phone: (775) 673-7619  
Fax: (775) 673-7397  
Email: Don.Sabol@dri.edu

**Professional Preparation**

Texas A&M Univ.,	Wildlife and Fisheries	B.S.,	1976
Univ. of Washington	Geology	B.S.	1983
Univ. of Iowa	Geology	M.S.	1985
Univ. of Washington	Geology	Ph.D.	1991

**Appointments**

2007 - present Assistant Research Professor, Division of Earth & Ecosystem Science, Desert Research Institute, Reno, Nevada.

1994 – 2006 Research Scientist, Remote Sensing Laboratory, University of Washington.; Part-time Lecturer

1991 – 1994 Post Doc., Remote Sensing Laboratory, University of Washington

1983 – 1985 Field Technician (GS 5), Water Resources Division, U.S. Geological Survey, Iowa City, Iowa

summer 1983 Field Technician (GS 5), Water Resources Division, U.S. Geological Survey, Portland Oregon

summer 1982 Field Assistant, Variegated Glacier research project in Alaska working for Dr. Barkley Kamb, California Institute of Technology

1976 – 1981 Senior Director (Captain - Regular Air Force), radar ground control for interceptor operations. Assignments include: Tyndall, AFB, Florida; Hall Beach, NWT, Canada (DEW Line); McCord AFB, Washington

**Publications**

- Sabol, D.E., Geology of the Thermopolis Lineament, southern Bighorn Basin, Wyoming, *Unpubl. Masters thesis*, University of Iowa, 104 pp., 1985.
- Hoppin, R.A., Putney, K.L., and Sabol, D.E., Surface structures along the western portions of the Florence Pass and Thermopolis lineaments, Bighorn Basin, Wyoming: *Proc. 6th Int. Conf. on Basement Tectonics*, pp. 45-51, 1986.
- Sabol, D.E., Adams, J.B., and Smith, M.O., Predicting the spectral detectability of surface materials using spectral mixture analysis, *Proc. Int. Geosci. and Remote Sensing Symp. 1990, (IGARSS '90) 2:967-970*, 1990.
- Gillespie, A.R., Smith, M.O., Adams, J.B., Willis, S.C., Fischer, A.F. III, and Sabol, D.E., Interpretation of residual images: Spectral mixture analysis of AVIRIS images, Owens Valley, California, *Proc. Airborne Sci. Workshop: AVIRIS*, Jet Propulsion Laboratory, Pasadena, CA. 4-5 June, 243-270, 1990.

- Roberts, D.A., Smith, M.O., Adams, J.B., Sabol, D.E., Gillespie, A.R., and Willis, S.C., Isolating woody plant material and senescent vegetation from green vegetation in AVIRIS data, *Proc. Airborne Sci. Workshop: AVIRIS*, Jet Propulsion Laboratory, Pasadena, CA. 4-5 June, 42-57, 1990.
- Sabol, D.E., Quantitative sub-pixel spectral detection of targets in multispectral images, *unpublished Ph.D. dissertation*, University of Washington, 116pp, 1991.
- Sabol, D.E., Adams, J.B., Smith, M.O., and Gillespie, A.R., Target detection thresholds using imaging spectrometer data, *Proc. Airborne Sci. Workshop: AVIRIS*, Jet Propulsion Laboratory, Pasadena, CA. 4-5 June, 99-104, 1991.
- Sabol, D.E., Adams, J.B., and Smith, M.O., Quantitative sub-pixel spectral detection of targets in multispectral images, *Jour. Geophys. Res.*, 97, E2, 2659-2672, 1992.
- Gillespie, A.R., Smith, M.O., and Sabol, D.E., A field measure of the "Shade" fraction, *Proc. Airborne Sci. Workshop: AVIRIS*, Jet Propulsion Laboratory, Pasadena, CA. 1-5 June, 32-34, 1992.
- Roberts, D.A., Smith, M.O., Sabol, D.E., Adams, J.B., and Ustin, S., Mapping the spectral variability in photosynthetic and non-photosynthetic vegetation, soils, and shade using AVIRIS, *Proc. Airborne Sci. Workshop: AVIRIS*, Jet Propulsion Laboratory, Pasadena, CA. 1-5 June, 38-40, 1992.
- Sabol, D.E., Roberts, D.A., Smith, M.O., and Adams, J.B., Temporal variation in spectral detection thresholds of substrate and vegetation in AVIRIS images, *Proc. Airborne Sci. Workshop: AVIRIS*, Jet Propulsion Laboratory, Pasadena, CA. 1-5 June, 132-134, 1992.
- Sabol, D.E., Bell, J.F., Adams, J.B., Detectability of crystalline ferric and ferrous minerals on Mars, abstract accepted for *Proc. Lunar and Planetary Science Conf. XXIV*, Houston, TX, 15-19 March, 1229-1230, 1993.
- Roberts, D.A., Adams, J.B., Sabol, D.E., Brooks, J.R., and Hinckley, T., Remote sensing of vegetation in Brazil, ecological implications of spectral mixtures, abstract submitted to the *Jour. of Ecology*, 1993.
- Roberts, D.A., Green, R.O., Sabol, D.E., and Adams, J.B., Temporal changes in endmember abundances, liquid water and water vapor over vegetation at Jasper Ridge, *Proc. Airborne Sci. Workshop. AVIRIS*, Jet Propulsion Laboratory, Pasadena, CA. 25-29 October, 153-156, 1993.
- Sabol, D.E., Roberts, D.A., Adams, J.B., and Smith, M.O., Mapping and monitoring changes in vegetation communities of Jasper Ridge, CA, using spectral fractions derived from AVIRIS images, *Proc. Airborne Sci. Workshop. AVIRIS*, Jet Propulsion Laboratory, Pasadena, CA. 25-29 October, 157-160, 1993.
- Adams, J.B., Sabol, D.E., Kapos, V., Filho, R.A., Roberts, D.A., Smith, M.O., and Gillespie, A.R., Satellite remote-sensing of spectral changes to infer surface processes in the Brazilian Amazon, (abstr.) submitted to *Remote Sens. Environ.*, 1p., 1993.
- Roberts, D.A., Green, R.O., Adams, J.B., Sabol, D.E., and Smith, M.O., Temporal and spatial relationships between topography, atmospheric water vapor, liquid water and endmember abundances of vegetation determined using AVIRIS, (abstr.) submitted for *Proc. Int. Geosci. and Remote Sensing Symp. 1994, (IGARSS '94)*, 2366-2368, 1994.

- Sabol, D.E., Adams, J.B., and Smith, M.O., Detectability of lunar tephra deposits: Examples from the Apollo 17 landing site, abstracted submitted for *Proc. Lunar and Planetary Science Conf. XXV*, Houston, TX, 14-18 March, 1181-1182, 1994.
- Smith, M.O., Adams, J.B., and Sabol, D.E., Spectral mixture analysis - new strategies for the analysis of multispectral data, in J.Hill and J. Megier (eds.), *Imaging Spectrometry - a Tool for Environmental Observations*, ECSC, EEC, EAEC, Brussels and Luxembourg, 125-143, 1994.
- Smith, M.O., Adams, J.B., and Sabol, D.E., Mapping sparse vegetation canopies, in J.Hill and J. Megier (eds.), *Imaging Spectrometry - a Tool for Environmental Observations*, ECSC, EEC, EAEC, Brussels and Luxembourg, 221-235, 1994.
- Adams, J.B., Sabol, D.E., Kapos, V., Almeida, R. Filho, Roberts, D.A., Smith, M.O., Gillespie, A.R., Classification of multispectral images based on fractions of endmembers: Applications to land-use change in the Brazilian Amazon, submitted to *Remote Sensing of Environment*, 52, 137-154, 1995.
- Sabol, D.E., Smith, M.O., Adams, J.B., Zukin, J.H., Tucker, C.J., Roberts, D.A., and Gillespie, A.R., AVIRIS spectral trajectories for forested areas of the Gifford Pinchot National Forest, (abstr.) submitted for *Fifth Annual JPL Airborne Earth Science Workshop, January 23-26, 1995*, 133-136, 1995.
- Sabol, D.E., Smith, M.O., and Adams, J.B., Tephra deposits at the Apollo 17 landing site using telescopic CCD images, abstracted submitted for *Proc. Lunar and Planetary Science Conf. XXVI*, Houston, TX, 13-17 March, 1211-1212, 1995.
- Johnson, P.E., Pinet, P.C., Chevrel, S.D., Sabol, D.E., and Adams, J.B., Multispectral mixture modeling of the Apollo 15 Landing site, abstracted submitted for *Proc. Lunar and Planetary Science Conf. XXVI*, Houston, TX, 13-17 March, 685-686, 1995.
- Zukin, J.H., Adams, J.B., Smith, M.O., Sabol, D.E., Gillespie, A.R., and Tucker, C.J., Spectral changes accompanying developmental stages in Pacific Northwest Forests, abstract submitted for *Third Thematic Conference Remote Sensing for Marine and Coastal Environments, September 18-20, 1995*.
- Gillespie, A.R., Adams, J.B., Smith, M.O., Gu, D., Sabol, D.E., and Zukin, J.H., 1995, Forest mapping potential of ASTER, *Jour. Rem. Sens. Soc. Japan*, 15(1):62-71, 1995.
- Smith, M.O., Gillespie, A.R., Adams, J.B., Tucker, C.J., Sabol, D.E., Zukin, J., and Roberts, D.A., Logging history of Bluff Creek, California from a 22 year record of Landsat MSS images (1995) (abs), *ERIM Conference*, Seattle, WA.
- Sabol, D.E., Monitoring land-use over time using spectral mixture analysis, in *Elements of Change 1995*, Aspen Global Change Institute, 79-81, 1995.
- Sabol, D.E., Smith, M.O., Adams, J.B., Gillespie, A.R., and Tucker, C.J., Monitoring forest regrowth using a multi-platform time series, submitted for *Sixth Annual JPL Airborne Earth Science Workshop, March 4-8, 6pp.*, 1996.
- Gillespie, A., Kahle, A., Abbott, E., and Sabol, D., MODIS-ASTER (MASTER) Airborne simulator characterization of thermal emissivity at Terra validation sites on Hawaii (abstract), *Fourteenth EI/Geologic Conference*, 2000.
- Sabol, D.E., Buck, P., and Gillespie, A.R., Direct detection of archaeological sites using remote sensing, *SERDP Project CS-1142 final report*, 35 pp, 2000.

- Balick, L.K., Gillespie, A.R., E. Abbott, E., Sabol, D., Kahle, A.B., Borel, C.C., and Pendergast, M., "Multiscale thermal-infrared measurements of the Mauna Loa caldera, Hawai'i", *Proc. SPIE Aerosense Conference*, Volume 4381, Orlando FL. pp 440-446, April 2001.
- Gillespie, Sabol, D.E., Gustafson, W., Abbott, E., and Kahle, A. Validation of ASTER Temperature/Emissivity standard product (abstract), *IGARSS*, 2001.
- Sabol, D.E., Gillespie, A.R., Adams, J.B., Smith, M.O., and Tucker, C.T., Structural stage in Pacific Northwest forests estimated using simple mixing models of multispectral images, *Rem. Sens. Envir.* 80/1, 1-16, 2002.
- Gillespie, A.R., Kahle, A., Sabol, D.E., Gustafson, W., and Abbott, E., Performance of the ASTER Temperature/Emissivity Separation Algorithm (abstract), submitted *IGARSS*, 2002.
- Gillespie, A.R., Gustafson, W., Sabol, D.E., Kahle, A., and Abbott, E., Temperature/Emissivity separation (Abstract). SSGRR, L'Aquila, Italy, 20 Aug, 2002.
- Kahle, A.B., Abbott, E.A., Gillespie, A.R., Grove, C., Sabol, D.E., and Yamada, G., Thermal infrared spectral changes of basalt from Kilauea on the annual-decadal time scale (abstract), submitted *AGU*, San Francisco, CA 6-10 Dec 2002.
- Abtachi, A., Kahle, A.B., Abbott, E.A., Gillespie, A.R., Hoover, G., Sabol, D.E., Yamada, G., and Pieri, D., Emissivity changes in basalt cooling after eruption from Pu'u O'o, Kilauea, Hawaii, (abstract), submitted *AGU*, San Francisco, CA 6-10 Dec 2002.
- Buck, P., Sabol, D.E., and Gillespie, A.R., Subpixel artifact detection using remote sensing, submitted to *Jour. Arch. Sci.*, vol 10, Issue 8, pp 973-989, 2003.
- Jiménez-Muñoz, J. C., J. A. Sobrino, A. Gillespie and D. Sabol. Separación emisividad/temperatura a partir de datos DAIS y aplicación del contraste espectral para discriminar distintos tipos de vegetación. *Revista de Teledetección*, 19:51-58, 2003
- Sabol, D.E., Caldwell, T., Gillespie, A., and McDonald, E., Remote sensing for mapping near-surface playa moisture, (abstract) *ARO annual review*, 1p, 2004.
- Gillespie, A.R., and Sabol, D.E., Astronomical dating of a solstice sun-dagger petroglyph at Swansea, Inyo County, California, *Epigraphic Soc. Occ. Publ.* v.24, 131-149, 2004.
- Sabol, D., Gillespie, A., Mushkin, A., Remote Sensing for characterization for desert surfaces, (abstract) for TEC meeting in Washington D.C., 1p, 4 Feb 2005.
- Jimenez-Munoz, J.C., Sobrino, J.A., Gillespie, A.R., Sabol, D.E., and Gustafson, W.T., Improved land surface emissivities over agricultural areas using ASTER NDVI, *Rem. Sens. Envir.* 103, 474-487, 2006.
- Sabol, D.E., Gillespie, A.R., McDonald, E., and Danillina, I., Differential thermal inertia of geological surfaces, submitted 2<sup>nd</sup> Annual International Symposium of Recent Advances in Quantitative Remote Sensing, Torrent, Spain, 6pp, 25-29 July 2006
- Sobrino, J.A., Jimenez-Munoz, J.C., Balick, L., Gillespie, A.R., Sabol, D.E., Gustafson, W.T., Accuracy of ASTER Level-2 thermal-infrared Standard Products of an agricultural area in Spain, *Rem. Sens. Envir.* 106(2), 146-153, 2007.

- Sabol, D.E., Desert soil characterization for detection of buried landmines and unexploded ordinance, *Proc. NGA Academic Research Symposium*, Washington, DC. 12-14 September, 69-704, 2007.
- Su, Z., Timmermans, W., Gieske, A., Jia, L., Elbers, J.A., Oliosio, A., Timmermans, J., Van Der Velde, R., Jin, X., Van Der Kwast, H., Sabol, D., Sobrino, J.A., Moreno, J., and Bianchi, R., Quantification of land-atmosphere exchanges of water, energy, and carbon dioxide in space and time over the heterogeneous Barrax site, *Int. Jour. Rem. Sens.* v. 29, issue 17&18, 5215-5235, 2008.
- McDonald, E., Amit, R., Bacon, S., Baker, S., Bassett, S., Boyle, D., Caldwell, T., Daldorf, G., Enzel, Y., Katra, I., Koracin, D., Miller, J., Minor, T., Sabol, D., and Sweeney, M., Integrated desert terrain forecasting for military operations: FY2008 interim progress report, prepared for the US Army Research Office, 47pp., August 2008.
- Sabol, D.E., Desert soil characterization for detection of buried landmines and unexploded ordinance, *Proc. NGA Academic Research Symposium*, Washington, DC. 9-12 September, 2008.
- Bacon, S.N., Dalldorf, G.K., McDonald, E.V., Baker, S.E., Sabol Jr., D.E., Minor, T.B., Bassett, S.D., MacCabe, S.R., Bullard, T.B. Predictive soil maps based on geomorphic mapping, remote sensing, and soil databases in the desert southwest: *3<sup>rd</sup> Global Workshop on Digital Soil Mapping*, Paper in Session 6, 10 p., 2008.
- Bacon, S.N., McDonald, E.V., Dalldorf, G.K., Baker, S.E., Sabol Jr., D.E., Minor, T.B., Bassett, S.D., MacCabe, S.R., Bullard, T.F. (2008). An expert based system to predict soil attributes using geomorphic mapping, remote sensing, and soil databases in the desert southwest USA: *European Geological Union*, EGU2008-A-10709; SSS25-1FR5P-0669, Abstract XY0669, 2008.
- Sabol, D.E., and Taranik, J.V., Quantitative spectral characterization of the background using full-spectrum hyperspectral data, Abstract UTIT 2008, Park City, UT, 2-4 Dec 2008.
- Sabol, D.E., Gillespie, A.R., Abbott, E., and Yamada, G., Field validation of the ASTER temperature-emissivity algorithm, *Rem. Sens. Envir.* 113, 2328 – 2344, 2009.
- Bacon, S.N., McDonald, E.V., Dalldorf, G.K., Baker, S.E., Sabol Jr., D.E., Minor, T.B., Bassett, S.D., MacCabe, S.R., Bullard, T.F. (2009). Predictive terrain hazard maps for military operations in the desert based on geomorphic mapping, remote sensing, and soil databases: *8<sup>th</sup> International Conference on Military Geosciences, Abstracts with Programs*, June 15-19, 2009, Vienna, Austria, p 14, 2009.
- Bacon, S.N., Dalldorf, G.K., McDonald, E.V., Baker, S.E., Sabol, D.E., Minor, T.B., Bassett, S.D., MacCabe, S.R., and Bullard, T.F., Predictive soil maps based on geomorphic mapping, remote sensing, and soil databases in the desert southwest. *Manuscript accepted as a chapter in a book titled: "2008 3rd Global Workshop on Digital Soil Mapping: Bridging Research, Production, and Environmental Application"* to be published in 2010.
- Sabol, D.E., Desert soil characterization for detection of buried landmines and unexploded ordinance, *Proc. NGA Academic Research Symposium*, Washington, D.C., 30 September-1 October, 2009.
- Taranik, J.V., Sabol, D.E., and Kruse, F.A., Application of full-range LWIR and VIS/NIR/SWIR image data for mapping geologic background clutter, Abstract UITI2009, Clearwater Beach, FL, 1-3 December 2009.

- Sabol, D.E., Kruse, F.A., Aslett, Z., Minor, T., Kratt, C., Taranik, J., and Morkin, T., Spatial and temporal VIS/SWIR/TIR spectral variability of natural desert surfaces, in *Third Recent Advances in Quantitative Remote Sensing*, Sobrino, J. eds., Publicacions diala Universitat de Valencia, p. 175 – 180, 2010.
- Aslett, Z., Taranik, J. V., Sabol, D., Riley, D., and Calvin, W., (in Review), Ground-based remote sensing of Precambrian-Cambrian lithologies at Hell's Gate, Death Valley National Park, CA, USA, using SEBASS thermal-infrared hyperspectral image data: in *Remote Sensing of Environment*, Elsevier, New York, 2011.
- Aslett, Z., Taranik, J. V., Kruse, F. A., Sabol, D., and Riley, D., (in Review) Multi-wavelength mineral mapping in Oasis Valley, Nevada using ProSpecTIR V-S reflectance and SEBASS emittance hyperspectral image data: in *International Journal of Remote Sensing*, London, U. K., 2011.
- Aslett, Z., Taranik, J. V., Sabol, D., (in Review) Multi-scale Comparison of Mineral Emittance Measurements using Ground, Aerial, and Spaceborne Image Data in Northeastern Death Valley National Park, California, USA: in *ASPRS*, 2011.
- Sabol, Donald E. and McDonald, E., "Remote Sensing for Rapid Surface Mapping of Desert Terrains in Support of Military Operations", Presented at 9<sup>th</sup> International Conference on Military Geosciences, June 20-24, Las Vegas, Nevada, 2011.
- Sabol, Donald E. and McDonald, E., "From Army Outpost to Global Military Installations: How WW2 Transformed the Military Presence in the Southwestern United States", Abstract 9<sup>th</sup> *International Conference on Military Geosciences*, June 20-24, Las Vegas, Nevada.
- Buck, Paul and Sabol, Donand E. "Detecting Prehistoric Landscape Use through Remote Sensing in NW Arizona, USA", *Abstract Geological Society of America* 9-12 October 2011, Minneapolis, MN, 2011.
- Buck, Paul and Sabol, Donand E. "Optimal Prehistoric Maize Field Locations in Mt Trumbull, AZ Area", *Abstract SAA 76<sup>th</sup> Annual Meeting*, March 31-April 3, 2011 Sacramento, CA, 2011.
- Sabol, Donald E. Jr., Taranik, J., Kruse, F., Calvin, W., kratt, C., Minor, T., Aslet, Z., and Morkin, T., "Final Report: Quantitative Spectral Characterization of Background Spectra Using Full Spectrum Hyperspectral Image Data"; Prepared for the Department of Energy: 31 October 2012; 263pp.
- Buck, Paul and Sabol, Donald E., Jr., "Final Report: Remote Sensing to Aid in the Search of Prehistoric Anasazi Agricultural Fields and Seasonal Dwellings in NW Arizona"; Prepared for NASA Space Archaeology Program; 12 April 2012; 39pp.
- Buck, Paul and Sabol, Donald E., Jr., "Remote Sensing for Detection of Prehistoric Landscape Use in NW Arizona", Abstracts for the Society for American Archaeology 77<sup>th</sup> annual meeting; Nashville, TN, 2012; p. 67.
- Buck, Paul and Sabol, Donald E., Jr., "Remote Sensing for Detection of Prehistoric Landscape Use in NW Arizona" Presented at the American Geophysical Meeting, San Francisco, CA; 2012; Abstract ref.# 1228306; Paper # GC13C-1089.

Buck, Paul, and Sabol, Donald E Jr., "Prehistoric Settlement Patterns and Optimal Maize Field Location in the Mt. Trumbull Region NW Arizona USA", Springer Briefs in Human Environment Interactions, Reconstructing the Natural and Anthropogenic Landscape, vol. 2, 2014, p.53-101.

Sabol, Donald E Jr., and Buck, Paul, "Determining Optimal Conditions for Direct Detection of Sub-Pixel Archaeological Materials Using Airborne and Satellite Spectral Data", submitted 4<sup>th</sup> Annual International Symposium of Recent Advances in Quantitative Remote Sensing, Torrent, Spain, 6pp, 22-26 September 2014, 6pp.

Sabol, Donald E Jr.; Minor, Tim; McDonald, Eric; and Bacon, Steven, "Parent Material Mapping of Geologic Surfaces Using ASTER In Support of Integrated Terrain Forecasting for Military Operations"; Prepared for the International Conference of Military Geology, in publication, 31pp, 2016.

Sabol, Donald E Jr. and McDonald, Eric, "From Army Outpost to Global military installations: How WW2 transformed the Military presence in the southwestern United States"; Prepared for the International Conference of Military Geology; in publication 21pp, 2016.