Ben Livneh, Ph.D.
Cooperative Institute for Research in Environmental Sciences (CIRES)
University of Colorado at Boulder
http://wwa.colorado.edu/about/livneh/

EDUCATION

Ph.D.	Civil and Environmental Engineering, University of Washington, 2012 *Emphasis: Hydrology*
M.E.Sc.	Civil and Environmental Engineering, University of Western Ontario, 2006
B.E.Sc.	Civil and Environmental Engineering, University of Western Ontario, 2004

POSITIONS HELD:

2014-	CIRES Research Scientist II, CU-Boulder.
2013-2014	CIRES Research Scientist I, CU-Boulder.
2013, 2014	Lecturer, Civil, Environmental, and Architectural Engineering, CU-Boulder.
2012-2013	CIRES Visiting Fellow, CU-Boulder.
2008,2010,2011	Adjunct Professor, Civil and Environmental Engineering, Seattle University.
2006-2012	Research Assistant, Land Surface Hydrology Group, University of Washington.
2006	Design and CAD Engineer, Lican Developments, Windsor, ON.
2003-2006	V.P. Sales and Engineering, Univercycle Recycling Co., Windsor, ON, Jiang Ying, China.
2004-2006	Graduate Teaching Assistant, Civil and Environmental Engineering, Univ. of Western Ontario
2002	Engineer Assistant, Quality Engineering Company, Southfield, MI, USA.
2001	Event Manager, Canada Summer Games, London, ON.

TEACHING

Lecturer: Modeling Hydrologic Systems (new), Graduate course at the University of Colorado, Boulder.
Adjunct Professor: Applied Hydraulics, Fluid Mechanics Laboratory (*teaching evaluations available by request*) – undergraduate courses at Seattle University.
Graduate Teaching Assistant: Environmental Hydraulics, Environmental Design, Land Surveying, and Geotechnical Engineering – undergraduate courses at the University of Western Ontario.
Other: Assisted in generating assignments for graduate course in Precipitation Analysis, at the University of Washington.

SYNERGISTIC ACTIVITIES

2014	Mentor, *Faculty Mentoring Students Program*, CU-Boulder.
2014	NASA User Working Group, Distributed Active Archive Center (DAAC) at NSIDC.
2013	Resource Speaker, *Water Education Foundation: Lower Colorado River Tour.*
2013	Session Chair, *American Geophysical Union, Fall Meeting, San Francisco, CA.*
2013	DISCCRS VIII Symposium Scholar: Dissertations Initiative for the Advancement of Climate Change Research
2012 -	Co-chair of Symposium Steering Committee, CU-Boulder Hydrologic Sciences Program.
2012 -	CIRES Members Council, Physical Science Division representative.
2012	Awarded CIRES Visiting Fellowship.
2012	Parallel session and Colloquium chair, 4th International Conference on Climate Change, Seattle, WA.
2011/2012	Vice President, Chi Epsilon, University of Washington Chapter.
2007 - 2010	Graduate and Professional Student Senate representative on the Student Technology Fee Committee, University of Washington: Review and approval of proposals for technology across campus.
2005/2006	Departmental Teaching Assistant Award – University of Western Ontario, CEE.
2004	Co-winner of the 4th year Student Design Project for the design of a waste water treatment facility, University of Western Ontario.
2004	Dean's Honor List, at B.E.Sc. graduation, University of Western Ontario.
2002	Université de Montréal, French Summer Language Bursary Program.

PUBLICATIONS

Kumar, R., **B. Livneh**, and L. Samaniego, **2013**: Towards computationally efficient large-scale hydrologic predictions with the multi-scale regionalization scheme, *Water Resources Research,* 49(9), 5700-5714.

Livneh B., E.A. Rosenberg, C. Lin, B. Nijssen, V. Mishra, K.M. Andreadis, E.P. Maurer, and D.P. Lettenmaier, **2013**: A Long-Term Hydrologically Based Dataset of Land Surface Fluxes and States for the Conterminous United States: Update and Extensions, *Journal of Climate*, doi:10.1175/JCLI-D-12-00508.1.

Xia Y., M. B. Ek, J. Sheffield, **B. Livneh**, H. Wei, S. Feng, L. Luo, J. Meng, and E. Wood, **2013**: Validation of Noah-simulated Soil temperature in the North American Land Data Assimilation System Phase 2, *Journal of Applied Meteorology and Climatology*, 52, 455–471.

Bohn, T. J., **B. Livneh**, J. W. Oyler, S. W. Running, B. Nijssen, and D. P. Lettenmaier, **2013**: Global evaluation of MTCLIM and related algorithms for forcing of ecological and hydrological models, *Agriculture Forest Meteorology*, 176, 38-49, doi:10.1016/j.agrformet.2013.03.003.

Livneh B., and D.P. Lettenmaier, **2013**: Regional parameter estimation for the Unified Land Model, *Water Resources Research*, doi:10.1029/2012WR012220.

Sheffield, J., **B. Livneh**, and E.F. Wood, **2012**: Representation of Terrestrial Hydrology and Large Scale Drought of the Continental US from the North American Regional Reanalysis, *Journal of Hydrometeorology,* 13, 856–876, doi: http://dx.doi.org/10.1175/JHM-D-11-065.1.

Livneh, B. and D.P. Lettenmaier, **2012**: Multi-criteria parameter estimation for the unified land model, *Hydrology and Earth System Sciences*, 16, 3029-3048, doi:10.5194/hess-16-3029-2012.

Mahanama, S.P., **B. Livneh**, R.D. Koster, D.P. Lettenmaier, and R.H. Reichle, **2012**: Soil Moisture, Snow, and Seasonal Streamflow Forecasts in the United States, *Journal of Hydrometeorology*, 13, 189-203, 10.1175/JHM-D-11-046.1.

Xia Y., K. Mitchell, M. Ek, J. Sheffield, B. Cosgrove, L. Luo, C. Alonge, H. Wei, J. Meng, **B. Livneh**, D.P. Lettenmaier, V. Koren, Q. Duan, K. Mo, Y. Fan, and D. Mocko, **2012**: Continental-scale water and energy flux analysis and validation for the North American Land Data Assimilation System Project Phase 2 (NLDAS-2), part 1: intercomparison and application of model products, *Journal of Geophysical Research*, 117, doi:10.1029/2011JD016048.

Xia Y., K. Mitchell, M. Ek, B. Cosgrove, J. Sheffield, L. Luo, C. Alonge, H. Wei, J. Meng, **B. Livneh**, Q. Duan, and D. Lohmann, **2012**: Continental-scale water and energy flux analysis and validation for the North American Land Data Assimilation System Project Phase 2 (NLDAS-2), part 2: Validation of Model-simulated streamflow, *Journal of Geophysical Research,* 117, doi:10.1029/2011JD016051.

Livneh, B., P.J. Restrepo, and D.P. Lettenmaier, **2011**: Development of a Unified Land Model for prediction of surface hydrology and land-atmosphere interactions, *Journal of Hydrometeorology*, 12(6), 1299-1320, 10.1175/2011JHM1361.1.

Livneh, B., Y. Xia, K.E. Mitchell, M.B. Ek, and D.P. Lettenmaier, **2010**: Noah LSM Snow Model Diagnostics and Enhancements, *Journal of Hydrometeorology*, 11(3),721-738.

Koster, R.D., S.P. Mahanama, **B. Livneh**, D.P. Lettenmaier, and R.H. Reichle, **2010**: Skill in Streamflow Forecasts Derived from Large-Scale Estimates of Soil Moisture and Snow, *Nature Geoscience* doi.10.1038/ngeo944.

Barlage, M., F. Chen, M. Tewari, K. Ikeda, D. Gochis, J. Dudhia, R. Rasmussen, **B. Livneh**, M. Ek, and K. Mitchell, **2010**: Noah Land Surface Model Modifications to Improve Snowpack Prediction in the Colorado Rocky Mountains, *Journal of Geophysical Research*, 115, doi:10.1029/2010JD13470.

Casola, J.H., L. Cuo, **B. Livneh**, D.P. Lettenmaier, M. Stoelinga, P.W. Mote and J. M. Wallace, **2009**: Assessing the Impacts of Global Warming on Snowpack in the Washington Cascades, *Journal of Climate*, 22(10), 2758-2772.

Munoz-Arriola, F., S. Shukla, T. Bohn, C. Zhu, **B. Livneh**, D.P. Lettenmaier, R. Lobato-Sanchez, A. Wagner-Gomez, **2009**. Prediccion de la Hidrologia Superficial en Norte America, *Resumen del Clima de la Frontera* , Julio 13: 1-5.

Livneh B., and M.H. El Naggar, **2008**: Axial testing and numerical modeling of square shaft helical piles under compressive and tensile loading, *Canadian Geotechnical Journal*, 45(8),1142-1155.

<u>In press:</u>

Kumar, S.V., C.D. Peters-Lidard, D. Mocko, Y. Liu, K. Arsenault, Y. Xia, M.B. Ek, G. Riggs, **B. Livneh**, and M., Cosh, **2014**: Assimilation of passive microwave-based soil moisture and snow depth retrievals for drought estimation, *Journal of Hydrometeorology*, (accepted).

Livneh B., J.S. Deems, D. Schneider, J.J. Barsugli, and N.P. Molotch, **2014**: Filling in the Gaps: Inferring Spatially Distributed Precipitation from Gauge Observations over Complex Terrain, *Water Resources Research* (in review).

Chen F., M. Barlage , M. Tiwari , R. Rasmussen , J. Jin , D.P. Lettenmaier **, B. Livneh** , C. Lin , G. Michuez-Macho , G-Y. Niu , L. Wen , Z-L. Yang, **2014**: Modeling seasonal snowpack evolution in the complex terrain and forested Colorado Headwaters region: A model inter-comparison study, *Journal of Geophysical Research* (in review).

Livneh B., J.S. Deems, B. Buma, J.J. Barsugli, D. Schneider, N.P. Molotch, K. Wolter, and C.A. Wessman, **2014**: Catchment Response to Bark Beetle Outbreak in the Upper Colorado River Basin, *Journal of Hydrology* (in review).

Non-Peer Reviewed:

Livneh, B., E. Marino and J. E. Ten Hoeve, **2014**: Emerging Ideas and Interdisciplinary Perspectives on Climate Change, *Eos Trans. AGU*, 95(7), 65.

Gordon, E.S., Pugh, E.T. and **Livneh B.**, **2014:** Bark Beetles: Cause for Concern in Snowy Western Watersheds? *Utility Intelligence and Infrastructure*. Ellwood Media Lab. Web. n.d.

Conference Proceedings:

Livneh, B., and J. S. Deems**, 2013:** "Merging Satellite and Model Information to Improve Snowpack and Water Supply Forecasting", Climate Change Technology Conference, Montreal, QC, Canada, Paper Number 1569695429.

Reports:

Severe Flooding on the Colorado Front Range, September 2013, Lukas J., …, **Livneh B.**, et al, **2013**, Western Water Assessment Report, http://wwa.colorado.edu/resources/front-range-floods/assessment.pdf?album=1&pid=43#top_display_media.

THESIS COMMITTEES

CU-Boulder	Dominik Schneider (Doctoral Committee, Geography), Elizabeth Houle (Masters Committee, Civil Engineering), Michal Fagrelius (Undergraduate Honors Committee, Geography), Andrew Verdin (Doctoral Preliminary Exam Committee, Civil Engineering), Srijita Jana (Doctoral Preliminary Exam Committee, Civil Engineering)
CU-Denver	Maryam Poshtiri (Doctoral Preliminary Exam Committee, Civil Engineering)

PROFESSIONAL MEMBERSHIPS

American Geophysical Union (AGU)
American Water Resources Association (AWRA)
Canadian Society for Civil Engineers (CSCE)

REVIEWING

National Science Foundation proposal reviewer;
Journals: Nature Climate Change, Journal of Hydrology, Journal of Geophysical Research, Journal of Hydrometeorology, Earth Interactions, Cold Regions Science and Technology, Water Resources Research, Climatic Change, Journal of Climate, Hydrologic Processes, Hydrology and Earth System Sciences, Journal of the Atmospheric Sciences, Geophysical Model Development, Natural Hazards and Earth System Sciences, International Journal of Climatology.

EXTERNAL FUNDING

USBR: $59,986
High-resolution meteorological and hydrologic data extension to trans-boundary basins in southern Canada and northern Mexico.

NASA: $28,562
Observing System Synthetic Experiment (OSSE) Project: Quantify the utility of airborne LiDar surveys of snow information on improving hydrologic forecasts.

SELECTED PRESENTATIONS

Livneh, B. (Invited), American Meteorological Society, Mountain Meteorology Webinar Series, July, **2014**. The treatment of snow in numerical model land surface schemes.

Livneh, B. (Invited) and J.S. Deems, Wyoming State Engineers Forum, Cheyenne, WY, May, **2014**. Beetles and Dust: unraveling influences on snowmelt and streamflow timing in the Upper Colorado River Basin

Livneh, B. (Invited), Evapotranspiration mini-workshop, North Central Climate Science Center, Fort Collins, CO, May, **2014**. Evapotranspiration via Water Balance Methods in Land Surface Models.

Livneh, B. (Invited), Annual Training Day: Planning Commission and Zoning Board of Appeals, Grand Junction, CO, Mar. **2014**: The Water Wildcard: Climate Impacts on Water Resources.

B. Buma, **B. Livneh ,** C. A. Wessman, Alaskan Coastal Rainforest Center lecture series, University of Alaska Southeast, Juneau AK, March, **2014**: Linking forest ecology, hydrology, and management to explore the implications of climate change on a critical ecosystem service.

Livneh, B. (Invited), National Centers for Atmospheric Research (NCAR) Seminar, Boulder, CO, Feb. **2014**: Hydrologic Interactions Across Multiple Scales: Stressors, Thresholds, and Responses.

Livneh, B. (Invited) Workshop on Quantitative Evaluation of Downscaled Data, National Centers for Atmospheric Research (NCAR), Aug., **2013**: Strengths, Weaknesses, and Motivations for Creating a Large-Scale Hydrologically Consistent Dataset.

Livneh, B., and J.S. Deems, AGU Chapman Conference on Seasonal to Interannual Hydroclimate Forecasts and Water Management, Jul., **2013**: From catchments to regional scales: hydrologic impacts of land cover disturbances in the Upper Colorado River Basin.

Livneh, B., and J. S. Deems**,** Climate Change Technology Conference, Montreal, QC, May, **2013:** Merging Satellite and Model Information to Improve Snowpack and Water Supply Forecasting.

Livneh, B. (Invited), Guest Lecture, Geology 5700, University of Colorado, Boulder, Apr. **2013**: Parameter Selection for Hydrologic Models.

Livneh, B. (Invited), J.S. Deems, and B. Buma, San Juan Bark Beetles & Watersheds Workshop, Durango, CO., Apr. **2013**: Beetles, Dust, and Climate Change: Unraveling Snowmelt Perturbations in the Intermountain West.

Livneh, B. (Invited), Water Education Foundation, Lower Colorado River Tour, Las Vegas, NV, Hoover Dam, AZ, Imperial Irrigation District, CA, Mar. **2013**, Colorado River Spring 2013 Runoff Outlook; Climate Change Projections on the Colorado River Basin – The Long Perspective from GCMs and Tree Rings.

Livneh, B. (Invited), J.S. Deems, and B. Buma, National Centers for Atmospheric Research (NCAR) Seminar, Boulder, CO, Jan. **2013**, Deciphering the impacts of competing hydrologic disturbance factors in the Upper Colorado River Basin.

Livneh, B., E.A. Rosenberg, C. Lin, B. Nijssen, V. Mishra, K. Andreadis, E.P. Maurer, and D.P. Lettenmaier, American Meteorological Society Annual Meeting, Austin, TX, Jan. **2013**, A long-term hydrologically based dataset of land surface fluxes and states for climatic modeling and analysis over the conterminous United States.

Livneh, B., J.S. Deems, B. Buma, J.J. Barsugli, D. Schneider, N. Molotch, and C. Wessman, American Geophysical Union Fall Meeting, San Francisco, CA, Dec. **2012**, Interpreting changes to Upper Colorado River Basin hydrologic response via alternate climatic and land-cover scenarios.

Livneh, B., J.S. Deems, B. Buma, J.J. Barsugli, D. Schneider, and C. Wessman, Upper Colorado River Basin Water Conference, Grand Junction, CO, Nov. **2012**, Modeling Hydrologic Impacts of Bark Beetles and Desert Dust on Tributary Catchments of the Upper Colorado River Basin.

Livneh, B. (Invited), CU-Boulder Hydrology and Water Resource Seminar, Boulder, CO, Sep. **2012**, Development of a Land Surface Model and the Prediction of Land-Atmosphere Fluxes and Streamflow Forecasting.

Livneh, B., B. Thrasher, and D.P. Lettenmaier, Climate Change Conference, Seattle, WA, Jul. **2012**, Updates and extensions to a long-term Hydrologically based dataset over the Conterminous United States.

Livneh, B., and D.P. Lettenmaier, European Geosciences Union General Assembly, Vienna Austria, Apr, **2012**, Transferability of land surface model parameters using remote sensing and in situ observations.

Livneh, B., and D.P. Lettenmaier, AGU Fall Meeting, San Fransisco, CA., Dec. **2011**, Land Surface Model parameter regionalization via remote sensing and observations (*poster*).

Livneh B. (co-presented with T.J. Bohn), University of Washington Hydrology Seminar, Aug. **2011**, Evaluating performance of MTCLIM and other hydrometeorological algorithms against a global set of station data.

Livneh, B., P.J. Restrepo, and D.P. Lettemnaier, 91st AMS Annual Meeting, Seattle, WA, Jan. **2011**, Application of a Unified Land Model for estimation of the terrestrial water balance (*poster*).

Koster, R. D., S. Mahanama, **B. Livneh,** D. P. Lettenmaier, and R. H. Reichle, 91st AMS Annual Meeting, Seattle, WA, **2011**, Predicting hydrological drought: relative contributions of soil moisture and snow information to seasonal streamflow forecast skill.

Livneh, B., P.J. Restrepo, and D.P. Lettemnaier, AGU Fall Meeting, San Fransisco, CA., Dec. **2010**, Exploring terrestrial and atmospheric constraints in land surface model validation (*poster*).

Livneh, B., D.P. Lettenmaier and K.E. Mitchell, University of Washington Climate Impacts Group, Seattle, WA, Jan. **2010**, Noah LSM Snow Model Diagnostics and Enhancements.

Livneh, B., and D.P. Lettenmaier, UBC-UW Hydrology Symposium,University of British Columbia, Vancouver, BC, Canada, 25 Sep. **2009**, Evapotranspiration Parititioning in Land Surface Models.

Livneh, B., Y. Xia, K.E. Mitchell, M.B. Ek, and D.P. Lettenmaier, CPPA PI's Meeting, Washington, DC, Sep **2008**, Noah LSM snow model diagnostics and enhancements (*poster*).

Livneh, B., E.P. Salathe, and D.P. Lettenmaier, UW/UBC, Hydrology Conference, Seattle, WA, Sep. **2008**, Understanding the sensitivity of Washington State snowpacks to climate change.

Livneh, B., D.P. Lettenmaier and K.E. Mitchell, AGU Fall Meeting, San Fransisco, CA., Dec. **2007,** Diagnosis of Performance of the Noah LSM Snow Model.