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**Interagency Ecological Program
Delta Stewardship Council
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Education

Ph.D. Ecology (Tidal Marsh Geomorphology) University of California at Davis
M.S. International Agricultural Development (Aquacultural Engineering) Univ. of California at Davis
B.A. Biology (History, Creative Writing) Oberlin College, Oberlin, Ohio

Positions and Employment

Lead Scientist, Interagency Ecological Program, 2016 to date; Senior Ecologist/Fish Biologist/Natural Resources Planner, U.S. Fish and Wildlife Service, 2009 to 2016; Assistant Field Supervisor (Acting), U.S. Fish and Wildlife Service, 2016, 2015, 2011; Deputy Field Supervisor (Acting), U.S. Fish and Wildlife Service, 2011; Staff Environmental Scientist, California Bay-Delta Authority/CALFED Science Program, 2005 to 2009; Staff Environmental Scientist, California Department of Water Resources, 2004 to 2005; Environmental Scientist, California Department of Water Resources, 2001 to 2004; Trainee, California Sea Grant Program, UC Davis, 1998 to 2001; Intern, California State Water Resources Control Board, Sacramento, 1996-1998; Teaching Assistant, Department of Agronomy and Range Science, 1998; Teaching Assistant, Ecology Graduate Group, 1995-1997; Research Fellow, Ecology Graduate Group, UC Davis, 1993-1996; Research Assistant, Department of Biological and Agricultural Engineering, UC Davis, 1990 to 1993; Natural Resources Observer, National Marine Fisheries Service, 1990; National Program Coordinator, Ministry of Water and Forestry, Gabon, 1988-1989; Regional Program Coordinator/Technical Consultant, Ministry of Agriculture, Zaire, 1987-1988; District Extension Agent, Projet Pisciculture Familiale, Zaire, 1985-87; Laboratory Assistant, Oberlin College, 1984.

Awards and Honors

Exceptional/Superior Performance Rating, USFWS, 2011-2016
CDWR Unit Citation, Interagency Ecological Program Pelagic Organism Decline Management Team, 2007
Professional Wetland Scientist Certification, 2003
California Sea Grant College Program Trainee, 1998 to 2001
Jastro-Shields Graduate Research Scholar, 1996 to 1998
Graduate Group in Ecology Research Fellow, 1993 to 1996
American Academy of Poetry Honorable Mention Award Winner, 1984

Societies and Memberships

American Institute of Biological Sciences (AIBS)
Coastal and Estuarine Research Federation (CERF)
American Association for the Advancement of Science (AAAS)
Wetlands Regional Monitoring Program Science Advisory Team (SFEP)
San Francisco Bay Nutrient Management Strategy Steering Committee (RWQCB 2)
Delta Science Program Science Advisors Committee (Delta Stewardship Council)

Publications and Presentations

Mahardja, B., Tobias, V., Khanna, S., Mitchell, L., Lehman, P., Sommer, T., Brown, L., Culberson, S., Conrad, J.L. 2020. Resistance and resilience of pelagic and littoral fishes to drought in the San Francisco Estuary. Ecological Applications, <https://doi.org/10.1002/eap.2243>.

Culberson, S.D. 2020. Monitoring scientifically and thinking ecologically. Address to the 2020 IEP Annual Workshop, October 13, 2020, Davis, CA (virtual workshop).

Culberson, S.D. 2019. Invited session contributor: The Science and Management of the San Francisco Estuary: Introduction to the San Francisco Estuary and its Fishes. American Fisheries Society Joint Annual Meeting with The Wildlife Society, Reno, NV, September 29-October 3, 2019.

Culberson, S.D., Baxter, R., Brown, L., Conrad, L., Fong, S., Goertler, P., Heublein, J., Hoffman, K., Kelly, J., La Luz, P., Lehman, P., Mahardja, B., Schreier, B., Slater, S., Sommer, T., and Takata, L. 2019. Interagency

Ecological Program Science Strategy 2020-2024: Investment priorities for interagency collaborative science. Program Report. 60pp.

Sommer, T., Conrad J.L., and Culberson, S. 2019. Ten Essential Bay-Delta Articles. San Francisco Estuary and Watershed Science, 17(2), article 1 (<https://doi.org/10.15447/sfew.2019v17iss2art1>).

Culberson, S.D. 2019. Science, Modeling, and Communication. Invited Keynote Address. California Water and Environmental Monitoring Forum 25th Annual Meeting, Folsom, CA, April 23, 2019.

Culberson, S.D., and 10 others. Interagency Ecological Program: History of long-term monitoring science in a multiagency context. 2018. Contributed Poster. National Science Foundation Long Term Ecological Research (LTER) Network All-Scientists Biennial Meeting, Asilomar, CA, October 1-4, 2018.

Culberson, S.D. Interim Roadmap for IEP Science Communication and Outreach. 2018. Communication to the IEP Science Community and the IEP Agency Directors. Sacramento, CA.

Culberson, S.D. 2018. IEP Frontiers: The Open Science movement and science communication. Address to the 2018 IEP Annual Workshop, March 6-8, 2018, Folsom, CA.

Culberson, S.D. 2018. IEP Organization, data collection, and communication: from the boat to the boardroom. Presentation to the Delta Stewardship Council, Monthly Meeting, January 25, 2018, Sacramento, CA. <http://deltacouncil.ca.gov/event-detail/15104>

Culberson, S.D. 2018. IEP Management Science: Theory, Practice, Future. Seminar given to the Delta Independent Science Board Brown Bag Series, January 4, 2018, Sacramento, CA. <http://deltacouncil.ca.gov/docs/brown-bag-presentation-1418-iep-management-science-dr-steve-culberson> <https://www.youtube.com/watch?v=L7uaDabxtUI&list=PLqTHClW1Hhqr6DXM6JF4gH8LSZiGs8Zg>

Sherman, S., R. Hartman, and D. Contreras, editors. 2017. Effects of Tidal Wetland Restoration on Fish: A Suite of Conceptual Models. IEP Technical Report 91. Department of Water Resources, Sacramento, California.

Culberson, S.D. 2015. 21st Century Delta: Reconciling the desired with the possible. California WaterBlog. Posted on February 19, 2015 by [UC Davis Center for Watershed Sciences](#)

Baxter, R., Brown, L.R., Castillo, G., Conrad, L., Culberson, S., Dekar, M., Dekar, M., Feyrer, F., Hunt, T., Jones, K., Joseph, K., Mueller-Solger, A., Nobriga, M., Slater, S., Souza, K., Erickson, G., Fong, S., Gehrts, K., Grimaldo, L., Herbold, B. 2015. An updated conceptual model of Delta Smelt biology: our evolving understanding of an estuarine fish. Interagency Ecological Program Technical Report 90. 206 p. http://www.water.ca.gov/iep/docs/Delta_Smelt_MAST_Synthesis_Report_January%202015.pdf

Brown, L.R., Baxter, R., Castillo, G., Conrad, L., Culberson, S., Erickson, G., Feyrer, F., Fong, S., Gehrts, K., Grimaldo, L., Herbold, B., Kirsch, J., Mueller-Solger, A., Slater, S., Souza, K., and Van Nieuwenhuysse, E. 2014. Synthesis of studies in the fall low-salinity zone of the San Francisco estuary, September–December 2011: U.S. Geological Survey Scientific Investigations Report 2014–5041, 136 p. <http://dx.doi.org/10.3133/sir20145041>

Enright, C., Culberson, S.D., and Burau, J.R. 2013. Broad timescale forcing and geomorphic mediation of tidal marsh flow and temperature dynamics. Estuaries and Coasts. DOI 10.1007/s12237-013-9639-7. Retrieved from: <http://link.springer.com/article/10.1007%2Fs12237-013-9639-7>

Culberson, S. 2012. Models as tools for learning. Presented at the Bay-Delta Science Program Science Conference 2012, October 16-18, 2012, Sacramento, CA.

MacNally, R., Thompson, J.R., Kimmerer, W.J., Feyrer, F., Newman, K.B., Sih, A., Bennett, W.A., Brown, L., Fleishman, E., Culberson, S.D., and Castillo, G. 2010. Analysis of pelagic species decline in the upper San Francisco Estuary using Multivariate Autoregressive Modeling (MAR). Ecological Applications, 20(5):1417-1430.

- Enright, C., and Culberson, S. 2009. Salinity Trends, Variability, and Control in the Northern Reach of the San Francisco Estuary. *San Francisco Estuary and Watershed Science*, 7(2). Retrieved from: <http://escholarship.org/uc/item/0d52737t>
- Culberson, S., Bottorff, L., Roberson, M., and Soderstrom, E. 2008. Geophysical setting and consequences of management in the Bay-Delta. Chapter 2 in: Healey, M.C., Dettuinger, M.D., and Norgaard, R.B., eds. 2008. *The state of Bay-Delta Science, 2008*. Sacramento, CA: CALFED Science Program. 174 pp. Available from: <http://www.science.calwater.ca.gov/publications/sbds.html>
- Kimmerer, W., Brown, L., Culberson, S., Moyle, P., Nobriga, M., and Thompson, J. 2008. Aquatic Ecosystems. Chapter 4 in: Healey, M.C., Dettuinger, M.D., and Norgaard, R.B., eds. 2008. *The state of Bay-Delta Science, 2008*. Sacramento, CA: CALFED Science Program. 174 pp. Available from: <http://www.science.calwater.ca.gov/publications/sbds.html>
- Healey, M., Dettuinger, M., Culberson, S., and Bottorff, L. 2008. Water Supply. Chapter 6 in: Healey, M.C., Dettuinger, M.D., and Norgaard, R.B., eds. 2008. *The state of Bay-Delta Science, 2008*. Sacramento, CA: CALFED Science Program. 174 pp. Available from: <http://www.science.calwater.ca.gov/publications/sbds.html>
- Luoma, S., Healey, M., Culberson, S., Shlemon, R., and Roos, M. 2008. Integration among issues of water and environmental management. Chapter 7 in: Healey, M.C., Dettuinger, M.D., and Norgaard, R.B., eds. 2008. *The state of Bay-Delta Science, 2008*. Sacramento, CA: CALFED Science Program. 174 pp. Available from: <http://www.science.calwater.ca.gov/publications/sbds.html>
- Dettuinger, M.D. and Culberson, S.D. 2008. Internalizing Climate Change – Scientific Resource Management and the Climate Change Challenges. *San Francisco Estuary and Watershed Science*. Vol. 6, Issue 2 (June), Article 5. <http://repositories.cdlib.org/jmie/sfews/vol6/iss2/art5>
- Sommer, T., C. Armor, R. Baxter, R. Breuer, L. Brown, M. Chotkowski, S. Culberson, F. Feyrer, M. Gingras, B. Herbold, W. Kimmerer, A. Mueller-Solger, M. Nobriga, and K. Souza. 2007. The collapse of pelagic fishes in the upper San Francisco Estuary. *Fisheries* 32(6): 270-277.
- Enright, C., Culberson, S.D., and Burau, J. 2006. Comparing natural and modified sloughs in Suisun Marsh: geometry determines variability. Presented at the CALFED Science Conference 2006, October 23-25, 2006, Sacramento, CA.
- Culberson, S.D. 2005. Building models to explore variability in Sacramento splittail populations: fueling biology via floodplain topography. Presented at a joint session of the Annual Meetings of the California Water and Environmental Modeling Forum and the Interagency Ecological Program, March 1-4, 2005, Asilomar, CA.
- Culberson, S.D., Foin, T.C., and Collins, J.N. 2004. The role of sedimentation in estuarine development within the San Francisco Estuary, CA, USA. *Journal of Coastal Research*, 20(4):970-979.
- Culberson, S.D. 2004. Combining Models to Explore Hydrology-Mediated Variability in Sacramento Splittail Populations: Interdisciplinary Problem Solving. Presented at the CALFED Science Conference 2004, October 4-6, 2004, Sacramento, CA.
- Culberson, S.D. 2004. Suisun Marsh geomorphologic process, ecosystem function, and contemporary management practice. Presented to the “Making Science Work for Suisun Marsh” Workshop sponsored by the San Francisco Bay-Delta Science Consortium and the California Day-Delta Authority, March 1-2, 2004, Sacramento, CA.
- Culberson, S.D., Harrison, C.B., Enright, C., and Nobriga, M.L. 2004. Sensitivity of larval fish transport to location, timing, and behavior using a Particle Tracking Model in Suisun Marsh, California, USA. In: *Early Life History of Fishes in the San Francisco Estuary and Watershed*, Feyrer, F., Brown, L.R., Brown, R.L., and Orsi, J.J. (eds.). American Fisheries Society Publication. 296 pp.
- Culberson, S.D. 2003. Soil salinity, surface elevation, and tidal hydrology influences on marsh vegetation zonation and productivity in the San Francisco Estuary, California, USA. Presented at the Estuarine Research Federation Biennial Meeting 2003, September 14-18, 2003, Seattle, WA.

- Culberson, S.D. 2003. Marsh Plain Sedimentation Processes within the San Francisco Estuary. Presented at the CALFED Science Conference 2003, January 14-16, 2003, Sacramento, CA.
- Culberson, S.D. 2002. Suisun Marsh Geomorphologic and Programmatic Perspectives – the view as a State Environmental Scientist. Presented at the American Geophysical Union Fall Meeting, December 6-10, 2002, San Francisco, CA.
- Culberson, S.D. 2002. San Francisco Bay Estuary Tidal Marsh Restoration – Deconstruction and Reconstruction. Presented at the San Francisco Bay/Sacramento-San Joaquin Delta Interagency Ecological Program Annual Meeting, February 27-March 1, 2002, Asilomar, CA.
- Culberson, S.D. 2001. Geomorphic Response of Delta Marshes to Sea Level Rise. Presented to the San Francisco Bay/Sacramento-San Joaquin Delta Modeling Forum, October 5, 2001, Sacramento, CA.
- Culberson, S.D. 2001. The interaction of physical and biological determinants producing vegetation zonation in tidal marshes of the San Francisco Bay/Delta, California, USA. Ph.D. Dissertation, University of California, Davis. 148 pp.
- Culberson, S.D., and Foin, T.C. 2001. Influence of salinity gradients on tidal marsh vegetation of the San Francisco Bay/Delta, CA, USA. Presented at the Society of Wetland Scientists Annual Meeting, May 28-June 1, 2001, Chicago, IL.
- Foin, T.C., Culberson, S.D., and Pakenham-Walsh, M.R. 2000. A productivity-based conceptual model of tidal marsh vegetation development. Presented at the CALFED Bay-Delta Program Science Conference, October 3-5, 2000, Sacramento, CA.
- Culberson, S.D., Foin, T.C., and Sanderson, E.W. 2000. Influence of hydrology on tidal marsh vegetation of the San Francisco Bay/Delta, CA, USA. Presented at the August 2000 Millennium Wetland Event, Society of Wetland Scientists, Quebec, CANADA.
- Culberson, S.D., Sanderson, E.W., and Foin, T.C. 1997. Tidal channels and vegetation zonation: patterns in Suisun Marsh, CA. Presented at the August 1997 Annual Meeting of the Ecological Society of America, Albuquerque, NM.
- Foin, T.C., Garcia, E.J., Gill, R.E., Culberson, S.D., and Collins, J.N. 1997. Recovery strategies for the California clapper rail (*Rallus longirostris obsoletus*) in the heavily-urbanized San Francisco estuarine ecosystem. *Landscape and Urban Planning*, 38:229-243.
- Piedrahita, R.H., Nath, S.S., Bolte, J., Culberson, S.D., Giovannini, P., Ernst, D. 1997. Computer Applications in Pond Aquaculture -- Modeling and Decision Support Systems. In: *Dynamics of Pond Aquaculture*. Boyd, C.E., and Egna, H. (eds.). CRC Press, Inc. 437pp.
- Culberson, S.D., and Piedrahita, R.H. 1996. Aquaculture Pond Ecosystem Model: Temperature and Dissolved Oxygen Prediction -- Mechanism and Application. *Ecological Modeling*, 89:231-258.
- Culberson, S.D., and Piedrahita, R.H. 1993. Model for Predicting Dissolved Oxygen Levels in Stratified Ponds Using Reduced Data Inputs. In: *Techniques for Modern Aquaculture*, J.K. Wang (ed.). American Society of Agricultural Engineers, St. Joseph, MI, pp. 543-552.
- Culberson, S.D., and Piedrahita, R.H. 1992. Modification of Stratified Temperature Model to Accommodate Reduced Data Inputs: Identifying Critical Requirements. Presented at the May 1992 meeting Aquaculture 92, sponsored by WAS/AFS/NSA/ASAE. Paper No. AQUA-92-102, American Society of Agricultural Engineers, 2950 Niles Road, ST. Joseph, MI 49085-9659.
- Research Grants**
 Sacramento Splittail Ecosystem Model. 2003-2005. Culberson, S.D., Sommer, T., Moyle, P.B., and Enright, C., Principal Investigators. Bay-Delta Authority Science Program. \$370,446 (DWR Internal Program Cost Code 2010305000).

Characterizing Vegetation-Hydrology Interactions for Tidal Marsh Restoration. 1998-2001. Foin, T.C., Collins, J.N., and Leopold, L.B., Principle Investigators (Culberson, S.D. and Sanderson, E.W., co-authors). California Sea Grant College Program. Grant No. R/CZ-154; \$152,182.

University Teaching Experience

ECL 200 A: Principles and Applications of Ecological Theory – Teaching Assistant and Discussion Leader; Fall Quarter 1995, Fall Quarter 1996
ECL 200 B: Principles and Applications of Ecological Theory – Teaching Assistant and Discussion Leader; Winter Quarter 1996
ASE 121: Systems Analysis for Agriculture and Resource Management – Laboratory Instructor; Winter Quarter 1998
ECL 128: Ecological Modeling – Guest Lecturer (Water Quality Modeling Case Study); Winter Quarter 1996
ABT 161 A: Aquacultural Engineering – Guest Lecturer (Materials Transport, Gas Transfer); Spring Quarter 1992

Reviewer

State of California Proposition 1 Grant Proposal Solicitation (CDFW)
California Sea Grant College Program
Ecological Engineering
Estuaries and Coasts
Interagency Ecological Program
Journal of Coastal Research
North American Journal of Fisheries Management
Restoration Ecology
San Francisco Estuary and Watershed Science
University of California Press

Selected Training

Introduction to System Dynamics and Systems Thinking (NCTC, 2015)
Climate Academy (NCTC, 2015)
Inspiring Leadership through Emotional Intelligence (NCTC, 2015)
Leadership Challenge (NCTC, 2012)

Reviews/Workshops (selected)

Making Connections: the 8th Biennial Bay-Delta Science Conference. Science Program Co-Chair. Delta Science Program/Delta Stewardship Council. October 28-30, 2014.
A Two-Part Discussion on Delta Conveyance Modeling in Support of the Delta Vision Blue Ribbon Task Force, Workshop 1: Modeling Approaches. April 3, 2008.
A Two-Part Discussion on Delta Conveyance Modeling in support of the Delta Vision Blue Ribbon Task Force, Workshop 2: Linking Physical and Biological Models for Ecosystem Prediction, Planning, and Performance. May 20, 2008.
Independent Review of the Regional Salmon Outmigration Study Plan. January 10, 2008.
Temperature Management and Modeling Workshop in support of an Operations Criteria and Plan Biological Assessment and Biological Opinion. April 1, 2008.
Science Issues Related to Delta Conveyance Options for California Water Supply – Results from two workshops regarding Delta conveyance infrastructure. August 22, and September 11, 2007.
Interagency Ecological Program Pelagic Organism Decline Workplan Science Review Panel. November 14 and 15, 2005.

Environmental Documentation (selected)

California Department of Fish and Game, Code Section 1601 Streambed Alteration Permit, Green Valley Creek Beaver Dam Debris Removal Project, 2002
U.S. Army Corps of Engineers, Clean Water Act Section 404 Nationwide Permit, Morrow Island Distribution System Intake Replacement Project, 2002
U.S. Army Corps of Engineers, Clean Water Act Section 404 Nationwide Permit, Roaring River Distribution System Levee Repairs, 2003
U.S. Fish and Wildlife Service and N.O.A.A. Fisheries, Endangered Species Act Incidental Take Permit, Morrow Island Distribution System, (2004)
U.S. Army Corps of Engineers, Clean Water Act Section 404 Nationwide Permit, Suisun Marsh Water Quality Monitoring Station Network Maintenance, (2014)

U.S. Fish and Wildlife Service, Draft Biological Opinion, 2-Gates Demonstration Project (pending)

References

Available upon request.