

CURRICULUM VITAE

Craig Richard Glenn

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 University of Hawaii, School of Ocean and Earth Science and Technology
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Education

University of Rhode Island	Oceanography - Marine Geology	Ph.D.	1987
University of California, Santa Cruz	Earth Science	M.S.	1980
University of California, Santa Cruz	Earth Science	B.S.	1978
Santa Barbara City College	Geology	A.A.	1976

Professional Experience

1999 – present	Professor	Dept. Earth Sciences (formerly Geology & Geophysics), University Hawaii, Manoa
2011 – present	Affiliate Professor	Water Resources Research Inst., University Hawaii, Manoa
2011 – 2012	Associate Dept. Chair	Dept. Geology & Geophysics, University Hawaii, Manoa
2001 – 2002	Associate Dept. Chair	Dept. Geology & Geophysics, University Hawaii, Manoa
1993 – 1999	Associate Professor	Dept. Geology & Geophysics, University Hawaii, Manoa
1988 – 1989	Visiting Professor	Swiss Federal Institute Technology (ETH), Zürich, Switzerland
1988 – 1993	Assistant Professor	Dept. Geology & Geophysics, University Hawaii, Manoa, HI
1987 – 1987	Instructor of Geology	Department of Geology, University of Rhode Island, RI
1981 – 1982	Instructor of Geology	Dept. Earth Science, Santa Barbara City College, CA
1980 – 1981	Petroleum Geologist	Amoco Petroleum Company, Denver, CO
1978 – 1980	Geologist	U.S. Geological Survey, Menlo Park, CA

Recent Instructional Activities

ERTH 423 – Marine Geology (3) [DP] – Fall 2021
 ERTH 309 – Sedimentology and Stratigraphy (with lab) (4) [WI, DP, DY] – Spring 2021
 ERTH 611 – Accelerated Introduction to Earth Sciences (3) – Fall 2020
 GG 309 – Sedimentology and Stratigraphy (with lab) (4) [DP, DY] – Spring 2020
 GG 611 – Accelerated Introduction to Geology (3) – Fall 2019
 GG 309 – Sedimentology and Stratigraphy (with lab) (4) [DP, DY] – Spring 2019
 GG 423 – Marine Geology (3) [DP] – Fall 2018
 GG 611 – Accelerated Introduction to Geology (3) – Fall 2018
 GG 309 – Sedimentology and Stratigraphy (with lab) (4) [WI, FW] [DP, DY] – Spring 2018
 GG 711 – Graduate Seminar – Submarine Groundwater Discharge and the Environment (3) – Fall 2017
 GG 309 – Sedimentology and Stratigraphy (with lab) (4) [DP, DY] – Spring 2017
 GG 410 – Undergraduate Seminar (2) – Fall 2016
 GG 423 – Marine Geology (3) [DP] – Fall 2016
 GG 309 – Sedimentology and Stratigraphy (with lab) (4) [WI, FW] [DP, DY] – Spring 2016
 GG 711 – Graduate Seminar – Submarine Groundwater Discharge and the Environment (3) – Fall 2016
 GG 309 – Sedimentology and Stratigraphy (with lab) (4) [DP, DY] – Spring 2015
 GG 711 – Graduate Seminar – Submarine Groundwater Discharge (3) – Fall 2015
 GG 423 – Marine Geology (3) [DP] – Fall 2014
 Sabbatical – Spring 2014

Graduate Students – Principal Advisor and Funding

Jonathan Cameron	M.S. 2020 - in progress
Matthew Duff	M.S. 2020 - in progress
Lucas Ellison	M.S. 2018-2020
Jordan Mason	M.S. 2018-2020
Daniel Dores	M.S. 2016-2018
Michael Mathioudakis	M.S. 2016-2018
Joseph Fackrell	Ph.D. 2012-2016
Joseph Kennedy	M.S. 2014-2016
Daniel Amato	Ph.D. 2010-2016 (Botany, Glenn co-advisor)
James Bishop	M.S. 2012-2015
Jacque Kelly	Ph.D. 2007-2012
Kayla Holleman	M.S. 2009-2011
Carrie Plath	M.S. 2007-2010
Adam Johnson	M.S. 2005-2007
Marc McGowan	M.S. 2001-2004
Geoff Garrison	Ph.D. 1997-2002
Rob Mullane	M.S. 1993
Richard Knight	M.S. 1992-1994
Rajan Sivaramakrishnan	Ph.D. 1991-1995
John (Jack) Kronen, Jr.	M.S. 1991-1994
Clark Sherman	M.S. 1989-1992

Research Interests

Aquatic, hydrologic, biogeochemical, and land-sea-air geophysical studies of water, nutrients, and pollutant fluxes of groundwater and of submarine groundwater discharge in coastal zones. Nutrient cycling. Groundwater and marine water nutrient biogeochemistry and source water backtracking. Organic matter degradation, redox and diagenetic and authigenic mineral reactions in pore waters.

Research Expertise

Water quality, oceanography, paleoceanography, limnology, low temperature sediment and aqueous geochemistry, light-stable isotope geochemistry, nutrient biogeochemistry, sedimentary diagenesis. Aerial infrared and subsurface geophysical imaging of groundwater and submarine groundwater discharge. Geochemistry, petrology and sedimentology of modern and ancient sediments and rocks.

Professional Recognition

2000 Fellow, Geological Society of America

Professional Societies

American Geophysical Union (AGU) (1985-present)
 Association for the Sciences of Limnology and Oceanography (ASLO) (2005-Present)
 Geological Society of America (GSA) (1991-Present)
 International Association for Sedimentologists (IAS) (1988-present)
 Society for Sedimentary Geology (SEPM) (1980-present)

Publications

* Indicates UHM Graduate Students Funded and Advised by C.R. Glenn

1. Dores*, D., **Glenn**, C.R., Tori, G., Whittier, R.B., and Popp, B.N., 2020. Implications for groundwater recharge from stable isotopic composition of precipitation in Hawai'i during the 2017–2018 La Niña. *Hydrological Processes*. <https://onlinelibrary.wiley.com/doi/abs/10.1002/hyp.13907>
2. Fackrell*, J.K., **Glenn**, C.R., Thomas, D., Whittier, R., and Popp., B.N., 2020. Stable isotopes of precipitation and groundwater provide new insight into groundwater recharge and flow in a structurally complex hydrogeologic system: West Hawai'i, USA, *Hydrogeology Journal* HJ-2019-6227. <https://doi.org/10.1007/s10040-020-02143-9>
3. Kelly*, J.L., Dulai, H., **Glenn**, C.R., and Lucey, P.G., 2018. Integration of aerial infrared thermography and in situ radon-222 to investigate submarine groundwater discharge to Pearl Harbor, Hawaii, USA. *Limnology and Oceanography* 9999, 1-20. doi:[10.1002/lno.11033](https://doi.org/10.1002/lno.11033)
4. Shuler, C., Dulai, H., DeWees, R., Kirs, M., **Glenn**, C.R., and El-Kadi, A.I., 2018. Isotopes, microbes, and turbidity: A multi-Tracer Approach to Understanding Recharge Dynamics and Groundwater Contamination in a Basaltic Island Aquifer. *Groundwater Monitoring and Remediation*, doi:[10.1111/gwmr.12299](https://doi.org/10.1111/gwmr.12299).
5. Shuler, C.K., El-Kadi, A.I., Dulai, H., **Glenn**, C.R., and Fackrell, J. 2017. Source partitioning of anthropogenic groundwater nitrogen in a mixed-use landscape, Tutuila, American Samoa. *Hydrology Journal*, Volume 25: 2419–2434 <https://link.springer.com/article/10.1007%2Fs10040-017-1617-x>
6. Bishop*, J.M., **Glenn**, C.R., Amato*, D.W., and Dulai, H., 2017. Effect of land use and groundwater flow path on submarine groundwater discharge nutrient flux. *Journal of Hydrology: Regional Studies* 11: 194-218 <https://doi.org/10.1016/j.ejrh.2015.10.008>
7. Fackrell*, J.K., **Glenn**, C.R., Popp, B.N., Whittier, R.W., and Dulai, H., 2016. Wastewater injection, biogeochemical reactions, and resultant groundwater N flux to coastal waters: Kā'anapali, Maui, Hawai'i. *Marine Pollution Bulletin* 110: 281-292.
8. Amato*, D.W., Bishop*, J.M., **Glenn**, C.R., Dulai, H., and Smith, C.M. 2016. Impact of Submarine Groundwater Discharge on Marine Water Quality and Reef Biota of Maui. *PLOS ONE* 11 (11): e0165825. doi:10.1371/journal.pone.0165825.
9. Hein, J.R., Koschinsky, A., Mikesell, M., Mizell, K., **Glenn**, C.R., and Wood, R., 2016. Marine phosphorites as potential resources for heavy rare earth elements and yttrium. *Minerals* 6, 22p. doi:10.3390/min6030088.
10. Swarzenski, P.W., Dulai, H. Kroeger, K.D., Smith, C.G., Dimova, N., Storlazzi, C.D., Prouty, N.G., Gingerich, S.B., and **Glenn**, C.R., 2016. Observations of nearshore groundwater discharge: Kahekili Beach Park submarine springs, Maui, Hawaii. *Journal of Hydrology: Regional Studies*. <http://dx.doi.org/10.1016/j.ejrh.2015.12.056>.
11. Kelly*, J.L., and **Glenn**, C.R., 2015. Chlorofluorocarbon apparent ages of groundwaters from West Hawaii, USA. *Journal of Hydrology* 527: 355-366. <http://dx.doi.org/10.1016/j.jhydrol.2015.04.069>

12. Ganguli, P.M., Swarzenski, P.W., Dulaiova, H., **Glenn**, C.R., and Russell, A., 2014, Mercury dynamics in a coastal aquifer: Maunaloa Bay, O‘ahu, Hawai‘i. *Estuarine, Coastal and Shelf Science* 140, 52-56.
13. Kelly*, J. L., **Glenn**, C.R. and P. G. Lucey. 2013. High-resolution aerial infrared mapping of groundwater discharge to the coastal ocean. *Limnology and Oceanography Methods* 11, 262-277. doi: 10.4319/lom.2013.11.262.
14. **Glenn**, C.R., Whittier, R.B. , Dailer, M.L., Dulaiova, H. , El-Kadi, A. I., Fackrell, J., Kelly, J.L., Waters, C.A., and Sevadjan, J., 2013. Lahaina groundwater tracer study – Lahaina, Maui, Hawaii. Final Report Vol. II. US Environmental Protection Agency, State of Hawaii Department of Health, US Army Engineer Research and Development Center. 502 pp.
15. Swarzenski, P.W., H. Dulaiova, M.L. Dailer, C.R. **Glenn**, C.G. Smith, and C.D. Storlazzi. 2013. A geochemical and geophysical assessment of coastal groundwater discharge at select sites in Maui and O‘ahu, Hawai‘i. In *Groundwater in the Coastal Zones of Asia Pacific*, edited by C. Wetzelhuetter, New York, NY: Springer Publishing. 27-47.
16. **Glenn**, C.R., Whittier, R.B. , Dailer, M.L., Dulaiova, H. , El-Kadi, A. I., Fackrell, J., Kelly, J.L., and Waters, C.A., 2012. Lahaina groundwater tracer study – Lahaina, Maui, Hawaii. Final Report Vol I. US Environmental Protection Agency, State of Hawaii Department of Health, US Army Engineer Research and Development Center.. 463 pp.
17. Dimova, N.T., Swarzenski, P.W., Dulaiova H., and **Glenn**, C.R., 2012, Utilizing multichannel electrical resistivity methods to examine the dynamics of the fresh water–seawater interface in two Hawaiian groundwater systems. *Journal of Geophysical Research*, 117, C0212.
18. Peterson, R.N., **Glenn**, C.R., H. Dulaiova, and T. Stieglitz, 2010. Exploring the formation of a working group to examine the subterranean estuary. *Limnology and. Oceanography Bulletin* 19(3), 69.
19. Peterson, R.N., Burnett, W.C., **Glenn**, C.R., and Johnson*, A.G., 2009. Quantification of point-source groundwater discharges to the ocean from the shoreline of the Big Island, Hawaii. *Limnology and. Oceanography Bulletin* 54(3), 890–904.
20. Imamoglu, M. S., Nathan, Y., Çoban, H., Soudry, S., and **Glenn**, C., 2009, Geochemical, mineralogical and isotopic signatures of the Semikan, West Kasrik “Turkish” phosphorites from the Derik–Mazıdağı–Mardin area, SE Anatolia. *International Journal of Earth Sciences*, 98 (7), 1679-1690.
21. Johnson*, A.G., **Glenn**, C.R., Burnett, W.C., Peterson, R.N. and Lucey. P. G., 2008 Aerial infrared imaging reveals large nutrient-rich groundwater inputs to the ocean. *Geophysical Research Letters* 35, L15606, doi: 10.1029/2008GL034574.
22. Fletcher, C.H., Bochicchio, C., Conger, C., Engels, M.S., Feirstein, E.J., Frazer, N., **Glenn**, C.R., Grigg, R.W., Grossman, E.E., and Harney, J., 2008, Geology of Hawaiian Reefs, In *Coral Reefs of the World*, V. 1, 435-487, DOI: 10.1007/978-1-4020-6847-8_11.
23. Peterson R.N., Burnett, W.C., **Glenn**, C.R. and Johnson*, A.G., 2007. A box model to quantify groundwater discharge along the Kona coast of Hawaii using natural tracers. *International Association of Hydrological Sciences*, p. 142, vol. 312, 142-149.

24. **Glenn**, C.R., and Filippelli, G.M., 2007. Authigenic mineral formation in the marine environment: Pathways, processes and products. *Deep Sea Research II*, 54: 1141-1146.
25. Soudry, D., **Glenn**, C.R., Nathan, Y., Segal, I., and VonderHaar, D.L., 2006. Evolution of Tethyan phosphogenesis along the northern edges of the Arabian-African shield during the Cretaceous-Eocene as deduced from temporal variations of Ca and Nd isotopes and rates of P accumulation. *Earth-Science Reviews*, 78, 27-57.
26. Fletcher, C.H., III, Murray-Wallace, C.V., **Glenn**, C.R., Sherman, C.E., Popp, B., and Hessler, 2005, Age and origin of Late Quaternary Eolianite, Kaiehu Point (Moomomi), Molokai, Hawaii. *Journal of Coastal Research* 44, 97-112.
27. Soudry, D., Segal, I., Nathan, Y., **Glenn**, C.R., Halicz, L., and Lewy, Z., and VonderHaar, D.L., 2004. $^{44}\text{Ca}/^{42}\text{Ca}$ and $^{143}\text{Nd}/^{144}\text{Nd}$ isotope variations in Cretaceous-Eocene Tethyan francolites and their bearing on phosphogenesis in southern Tethys. *Geology*, v. 32 (5), 389-392.
28. Engels, M.S., Fletcher, C.H., Field, M.E., Storlazzi, C.D., Grossman, E.C., Rooney, J.B., Conger, C.L., and **Glenn**, C.R. 2004. Holocene reef accretion: Southwest Molokai, Hawaii: *Journal of Sedimentary Research*, 74 (2), 255-269.
29. **Glenn**, C.R. and Garrison, R.E.: Phosphorites. 2003. Encyclopedia of Sediments and Sedimentary Rocks, G. Middleton (Ed.). Kluwer Academic, 519-526.
30. Garrison*, G.H., **Glenn**, C.R., and McMurtry, G.M., 2003. Measurement of submarine groundwater discharge in Kahana Bay, Oahu, Hawaii. *Limnology and Oceanography*, 48, 920-928. (http://also.org/lo/toc/vol_48/issue_2/0920.pdf).
31. Resig, J.M., and **Glenn**, C.R., 2003, Sieve plates and habitat adaptation in the Foraminifer *Planulina ornata*. *Pacific Science*, Vol. 57, no. 1, 103-110.
32. Soudry, D., Nathan, Y., and **Glenn**, C.R., 2002, Phosphorus accumulation rates in the upper Cretaceous – Eocene of the southern Tethys margin: *Israel Geological Survey Bulletin*, 14, 51p.
33. **Glenn**, C.R., Prévôt-Lucas, L. and Lucas, J., 2000, Marine Authigenesis: A holistic approach. In: Marine Authigenesis: From Global to Microbial, C.R. Glenn, L. Prévôt-Lucas, and J. Lucas, J (Eds.), *SEPM Special Publication No. 66*.
34. Kronen*, J.D., Jr., and **Glenn**, C.R., 2000, Pristine to reworked minerals of the verdine facies: Keys to interpreting sequence stratigraphy and sequence condensation in mixed carbonate-siliciclastic forereef sediments (Great Barrier Reef). In: Marine Authigenesis: From Global to Microbial, C.R. Glenn, L. Prévôt-Lucas, and J. Lucas (Eds.), *SEPM Special Publication No. 66*, p. 387-403.
35. Burnett, W.C., **Glenn**, C.R., Yeh, C.C., Schultz, M., Chanton, J., and Kashgarian, M., 2000, New U-series, AMS ^{14}C , and stable isotope studies of recent phosphatic "protocrusts" from the Peru margin. In: Marine Authigenesis: From Global to Microbial, C.R. Glenn, L. Prévôt-Lucas, and J. Lucas (Eds.), Society of Sedimentary Geology *SEPM Special Publication No. 66*, p. 163-183.
36. **Glenn**, C.R., Prévot-Lucas, L., and Lucas, J., Eds., 2000, Marine Authigenesis: From Global to Microbial. Society of Sedimentary Geology, SEPM Special Publication Number 66. Tulsa. 536 p.

37. Compton, J., **Glenn**, C.R., Filippelli, G., Föllmi, K., Shields, G. and Zanin, Y., 2000, Variations in the Global Phosphorus Cycle. In: Marine Authigenesis: From Global to Microbial, C.R. Glenn, L. Prévôt-Lucas, and J. Lucas (Eds.), *SEPM Special Publication No. 66*, p. 21-33.
38. Carroll, A.R., Stephens, N.P., Hendrix, M.S., and **Glenn**, C.R., 1998, Eolian-derived siltstone in the Upper Permian Phosphoria Formation: Implications for marine upwelling. *Geology*, 26: 1023-1026.
39. Resig, J.M., and **Glenn**, C.R., 1997, Foraminifera encrusting phosphoritic hardgrounds of the Peruvian upwelling zone: Taxonomy, geochemistry and distribution. *Journal of Foraminiferal Research*, 27: 133-150.
40. Rajan*, S., Mackenzie, F.T., and **Glenn**, C.R., 1996, A thermodynamic model for water column precipitation of siderite in the Plio-Pleistocene Black Sea. *American Journal of Science*, 296: 506-548.
41. **Glenn**, C.R., and McMurtry, G.M. (Editors), 1995, Scientific Studies of the Ala Wai Canal, an Artificial Tropical Estuary in Honolulu, Hawai'i. *Pacific Science*, 49, No. 4, 11 papers, p. 307-525.
42. **Glenn**, C.R., Rajan* S., McMurtry, G.M., and Benaman, J., 1995, Geochemistry, Mineralogy and Stable Isotopic Results from Ala Wai Estuarine Sediments: Records of Hypereutrophication and Abiotic Whitings. *Pacific Science*, 49: 367-399.
43. **Glenn**, C. R. and McMurtry, G. M. 1995, Scientific Studies and History of the Ala Wai Canal, an Artificial Tropical Estuary in Honolulu. *Pacific Science*, 49: 307-318.
44. McMurtry, G.M., Snidvongs, A., and **Glenn**, C.R., 1995, Modeling sediment accumulation and soil erosion with ¹³⁷Cs and ²¹⁰Pb in the Ala Wai Canal and the central Honolulu watershed, Hawaii. *Pacific Science*, 49: 412-451.
45. **Glenn**, C.R., Arthur, M.A., Resig, J.M., Burnett, W.C., Dean, W.E., and Jahnke, R.A., 1994, Are Modern and Ancient Phosphorites Really So Different? In: Siliceous, Phosphatic and Glauconitic Sediments of the Tertiary and Mesozoic, A. Iijima, A.M. Abed, and R.E. Garrison (eds), VSP Sci. Publ., Zeist, 159-188.
46. **Glenn**, C.R., Föllmi, K.B., Riggs, S.R., Baturin, G.N., Grimm, K.A., Trappe, J., Abed, A.M., Galli-Oliver, C., Garrison, R.E., Ilyan, A., Jehl, C., Rohrlisch, V., Sadaqah, R.M., Schidlowski, M., Sheldon, R.E., and Siegmund, H., 1994, Phosphorus and Phosphorites: Sedimentology and Environments of Formation. *Eclogae geologicae Helvetiae* 87, 747-788.
47. **Glenn**, C.R., and Kronen*, J.D., Jr., 1993, Origin and significance of Late Pliocene phosphatic hardgrounds on the Queensland Plateau, Northeastern Australian Margin. In: *Proc. ODP, Sci. Results*, 133, Mckenzie, J.A., Davies, P.J., Palmer-Julson, A., et al., College Station, TX (Ocean Drilling Program), 525-534.
48. **Glenn**, C.R., Kronen*, J.D., Jr., Symonds, P.A., Wei, W. and Kroon, D., 1993, High resolution sequence stratigraphy, condensed sections and flooding events off the Great Barrier Reef: 0-1.5 Ma. In: *Proc. ODP, Sci. Results*, 133, Mckenzie, J.A., Davies, P.J., Palmer-Julson, A., et al., College Station, TX (Ocean Drilling Program), 353-364.
49. **Glenn**, C.R., Kroon, D., and Wei, W., 1993, Sedimentary rhythms and climate forcing of Pleistocene-Holocene mixed carbonate/siliciclastic sediments off the Great Barrier Reef. In: *Proc. ODP, Sci.*

- Results*, 133, Mckenzie, J.A., Davies, P.J., Palmer-Julson, A., et al., College Station, TX (Ocean Drilling Program), 189-202.
50. Sherman*, C.E., **Glenn**, C.R. Jones, A., Burnett, W.C., and Schwarcz, H.P., 1993, New evidence for two highstands of the sea during the last interglacial, oxygen isotope substage 5e. *Geology* 21, 1079-1082.
 51. Ladd, J., Moran, K., Kroon, D., Jarrard, J.D., Chen, M.-P., Palmer-Julson, A., and **Glenn**, C., 1993, Porosity variation and consolidation on the northeast Australian Margin. In: *Proc. ODP, Sci. Results*, 133, Mckenzie, J.A., Davies, P.J., Palmer-Julson, A., et al., College Station, TX (Ocean Drilling Program), 617-624.
 52. **Glenn**, C.R. and Kelts, K., 1991, Sedimentary Rhythms in Lake Deposits. In: *Cycles and Events in Stratigraphy*, G. Einsele, W. Ricken and A. Seilacher (Editors), Springer-Verlag, Berlin Heidelberg, pp. 188-221.
 53. **Glenn**, C. R., 1990, Pore water, petrologic and stable carbon isotopic data bearing on the origin of modern Peru margin phosphorites and associated authigenic phases. In: W.C. Burnett and S.R. Riggs (Eds.), *Phosphate Deposits of the World: Volume 3, Genesis of Neogene to Recent Phosphorites*. Cambridge University Press, 46-61.
 54. **Glenn**, C. R., and Arthur, M. A., 1990. Anatomy and origin of a Cretaceous phosphorite-greensand giant, Egypt: *Sedimentology*, 37: 123-154.
 55. **Glenn**, C.R., 1990, Depositional Sequences of the Duwi, Sibâiya and Phosphate Formations, Egypt: phosphogenesis and glauconitization in a Late Cretaceous epeiric sea: In: Notholt, A.J.G. and Jarvis, I. (eds.), *Phosphorite Research and Development, Geological Society Spec. Publ. No. 52*, pp. 205-222.
 56. **Glenn**, C. R., Arthur, M. A., Yeh, H.-W., and Burnett, W. C., 1988. Carbon isotopic composition and lattice-bound carbonate of Peru-Chile margin phosphorites. *Marine Geology*, 80: 287-307.
 57. **Glenn**, C. R., and Arthur, M. A., 1988. Petrology and major element geochemistry of Peru margin phosphorites and associated diagenetic minerals: Authigenesis in modern organic-rich sediments. *Marine Geology*, 80: 231-267.
 58. **Glenn**, C. R., and Arthur, M. A., 1985. Sedimentary and geochemical indicators of productivity and oxygen contents in modern and ancient basins: The Holocene Black Sea as the "Type" anoxic basin. *Chemical Geology*, 48: 325-354.
 59. Younse, G., and **Glenn**, C. R., 1980. Summary of the Petroleum potential of the Philippine Islands: *U.S. Geol. Survey, Open File Rept.*
 60. **Glenn**, C. R., and Denman, J. M., 1980. Bibliography and Index of Egyptian Geology, 1900-1978. *U.S. Geol. Surv. Open File Rept*, 80-930: 218p.
 61. **Glenn**, C. R., 1979. Regional geology of Peru. *U. S. Geol. Surv. Rept.*, Peru Investigations (IR) PE-6: p. 13-26.
 62. Garrison, R. E., **Glenn**, C. R., Snavely, P.D., and Mansour, S. E. A., 1979. Sedimentology and origin of Upper Cretaceous phosphorite deposits at Abu Tartur, Western Desert, Egypt. *Annals Geol. Surv. Egypt*, v. 9: 261-281.

63. **Glenn, C. R., and Mansour, S. E. A., 1979.** Reconstruction of the depositional and diagenetic history of phosphorites and associated rocks of the Duwi Formation (Late Cretaceous), Eastern Desert, Egypt. *Annals Geol. Surv. Egypt*, v. 9: 388-407.

Research Funding – Last 10 Years (\$3.4M)

Collaborative Study of Groundwater Transport Paths and Discharge Loads of Wastewaters and Other Land-Uses that Impact the Ewa Coastal Zones of West O‘ahu. NOAA/Sea Grant. Funding period: 2/1/2020 - 1/31/2022. Craig R. Glenn (PI). Aly I. El-Kadi, Celia Smith, Merik Kirs, Niels Grobde, and Robert Whittier (Co-Is). \$163,816

Identifying Groundwater Flow and Contamination on the Ewa Plain of Oahu. State of Hawaii Department of Health, Safe Drinking Water Branch. Craig R. Glenn (PI). Funding period: 6/1/2020-7/1/2022. \$76,082

Collaborative Investigation of Hydraulic and Geochemical Connectivity Between Wastewaters and Other Land Uses and the Ocean Waters of Waialua Bay, Oahu. NOAA/Sea Grant. Funding period: 2/1/2018 - 7/31/2020. Craig R. Glenn (PI). Aly I. El-Kadi, Henrieta Dulaiova, Celia Smith and Robert Whittier (Co-Is). \$162,182

Collaborative Investigation of Hydraulic and Geochemical Connectivity Between Wastewaters and Land-Use and the Oceanic Waters of Kāne‘ohe Bay, Oahu. NOAA/Sea Grant. Funding period: 2/1/2016 - 7/31/218. Craig R. Glenn (PI). Aly I. El-Kadi, Henrieta Dulaiova, Celia Smith, Craig Nelson, and Robert Whittier (Co-Is). \$150,772

Source tracking coastal groundwater and runoff contamination with microbial genomics and dissolved organic fluorometry. NOAA/Sea Grant. Funding period: 2/1/2016 - 7/31/218. Craig Nelson (PI). Craig Glenn and Henrietta Dulai (Co-Is). \$149,616

The role of surface and groundwater inputs in driving water quality in Kaneohe Bay, Oahu. NOAA/Sea Grant. Funding period: 2/1/2016 - 7/31/218. Henrietta Dulai (PI). Craig Glenn and Paul Lucey (Co-PIs). NOAA/Sea Grant. Funding period: 2/1/2016 - 7/31/218. Henrietta Duali (PI). Craig Glenn and Paul Lucey (Co-Is). \$131,874

Identifying Groundwater Flow and Contamination in Streams-Kahaluu Watershed. State of Hawaii Department of Health. 8/1/2016 - 7/31/218. C.R. Glenn (PI). \$19,994

Identifying Groundwater Flow and Contamination in Streams: Kahaluu Watershed, Oahu. U.S. Geological Survey/Hawaii State Water Resources Research Institute Program. Funding period: 3/2016-2/2018. C.R. Glenn (PI). H. Dulai and R. Whittier (Co-PIs). \$43,336

Assessing Recharge Mechanisms of Groundwater Under the Influence of Surface Water with Isotopic and Microbiological Tracers, Tutuila, American Samoa. U.S. Geological Survey/Hawaii State Water Resources Research Institute Program. Funding period: 3/1/2016-9/30/2018. Marek Kirs and Craig R. Glenn (Co-PIs). \$41,392

Quantifying Transport and Land-use Impacts of Groundwater and Nutrient Loadings to the Coastal Zones of Maui. NOAA/Sea Grant. Funding period: 2/1/2014-7/31/2016. C. Glenn (PI). H. Dulaiova, P. Lucey, A. El-Kadi, J. Kelly (Co-I's). \$152,373

Tracing Interconnectivity Between High-level and Basal Groundwaters in West Hawaii. U.S. Geological Survey/Hawaii State Water Resources Research Institute Program. Funding period: March 1, 2014-February 29, 2016. C. R. Glenn (PI). \$21,442

Numerical Simulation of Cold Intermediate Depth Seawater Circulation through the Keauhou Aquifer in North Kona, Hawaii. U.S. Geological Survey/Hawaii State Water Resources Research Institute. Funding period: 3/1/2015-2/29/2016. C. R. Glenn (PI). \$20,344

Connecting Land-Use to Submarine Groundwater Discharge Loads and Coral Reef Health within the Coastal Zones of Maui. NOAA/Sea Grant. 2/1/2012-7/31/2014. C.R. Glenn (PI). H. Dulaiova, B. Popp and C. Smith (Co-I's). \$138,343

Assessing Ground Water Sustainability of the Island of Tutuila, American Samoa. U.S. Geological Survey/Hawaii State Water Resources Research Institute. 03/01/2013-02/28/2015. A. El-Kadi (PI) and H. Dulaiova and C.R. Glenn (Co-PIs). \$52,976

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