Denise Coleman started her career as Chesapeake Bay Watershed Assessment technician for several conservation districts in the northern tier of Pennsylvania. She then worked for NRCS as a soil conservation technician in Columbia, Montour, Wayne, and Lackawanna Counties. In the mid-1990s, she moved to Washington, DC to obtain her Master's Degree in Environmental Management and Policy at George Washington University. During that time, she worked as a resource conservationist with NRCS in National Office. She served in a variety of capacities, working on Farm Bill programs, Food Security Act Compliance, and conservation planning policy. After she completed her degree, Denise continued her career in the National Office. She worked for the Programs Deputy Branch in a variety of areas, including but not limited to, 2002 Farm Bill Coordinator, Programs Program Allocations Analyst, and National Farmland Protection Program (later Farm and Ranch Land Protection Program) national manager.

Following her time in the Programs Deputy Branch, Denise served as an analyst for the Strategic Planning and Performance Division where she co-wrote the Agency Strategic Plan, worked on performance and budget formulation, co-served as the PART coordinator, and wrote the 2008 regulations for the: Environmental Quality Incentives Program, Wildlife Habitat Incentives Program, Agricultural Management Assistance, and the announcement for the Cooperative Conservation Partnership Initiative.

After the 2008 Farm Bill regulations were completed, Denise served as the Regional Conservationists' Chief of Staff for two years. In 2010, she was hired as the State Conservationist for Pennsylvania.