The spherical torus H-mode pedestal is a challenging validation regime due to gradient scale lengths comparable to the ion gyro-radius, large $\rho^*$, and strong shaping. Here, we investigate the spatial and temporal properties of pedestal turbulence and ELM bursts in NSTX H-mode plasmas. First, we present measurements, scalings, and simulations of pedestal turbulence correlation lengths and fluctuation amplitudes with $k_\theta \rho_i < 1.5$ and $0.8 < r/a < 0.95$ [1, 2]. Fluctuation amplitudes are in the range $\delta n/n \approx 1\%-5\%$. Parametric dependencies among turbulence quantities and transport-relevant plasma parameters indicate $\delta n/n$ scales positively with $\nabla n_e$, collisionality, and poloidal beta, and scales negatively with $\nabla T_i$. The scalings are most consistent with trapped electron mode, kinetic ballooning mode, or microtearing instabilities, but, notably, least consistent with ion temperature gradient turbulence. Gyrokinetic simulations with realistic pedestal profiles show collisional instabilities with growth rates that increase at higher $\nabla n_e$ and decrease at higher $\nabla T_i$, in qualitative agreement with observed scalings. Next, we investigate the radial structure and temporal dynamics of ELM bursts in NSTX. Measurements show bursts are typically oscillatory, though incoherent, with duration 20 $\mu$s–1 ms and stored energy losses of 1%–17%. The radial structures are typically non-uniform across the pedestal. To identify and explore patterns in the data, we apply wavelet analysis and principle component analysis. Wavelet analysis can effectively identify signal discontinuities associated with high-order time derivatives. Principle component analysis indicates 10%–30% of signal components are radially non-uniform. Collectively, the observations indicate complex spatial and temporal dynamics in the fast evolution of ELM bursts, and we hope further analysis can provide direction for the validation of nonlinear ELM simulations.