 Persistent patterns of diffusing scalar fields advected by periodically driven dynamics have been reported in a wide variety of contexts ranging from table-top and ocean-scale fluid mixing systems to the so-called weak quantum-classical transition in open Hamiltonian systems. We illustrate a common framework for the emergence of these patterns by considering a simple measure of structure maintenance provided by the average radius of the scalar distribution in transform space. Power-law scaling of this measure with diffusivity is observed. Connections between the geometric details and multi-fractality of the conservative phase-space geometry and both the observed scaling exponents and numerically determined Floquet spectra of the one-period advection-diffusion operator are examined.