1046-52-77 **Wesley Pegden*** (pegden@math.rutgers.edu), Department of Mathematics, Rutgers University (New Brunswick), 110 Frelinghuysen Rd., Piscataway, NJ 08854. *Which sets are resilient to erosion?*

Given a subset X of $\mathbb{R}^n$, define the *erosion* $e_r(X)$ of X by the radius r as the set of points of X at distance $\geq r$ from the complement X^C of X. So we have

$$e_r(X) = X \setminus \bigcup_{y \in X^C} B(r, y), \tag{1}$$

where $B(r, y)$ denotes an open ball of radius r about y. We are interested in determining which sets are *resilient* to erosion by some radius $r > 0$; *i.e.,* which sets X are equivalent under a Euclidean similarity transformation to their erosion $e_r(X)$.

We answer this question by giving a complete and somewhat suprising characterization of resilient sets; in a certain sense, it is one part convex geometry, and one part 'fractal' geometry. While we characterize all convex resilient sets with simple geometric constraints, the rest of the characeterization comes from a natural correspondence between a certain class of resilient sets (which includes all nonconvex resilient sets) and 'scale-invariant' sets. (Received July 21, 2008)