Knutson and Miller (2005) showed that the multidegree of a matrix Schubert variety $X_w$ is the corresponding Schubert polynomial $S_w$. Moreover, after Gröbner degeneration with respect to any antidiagonal term order, the resulting irreducible components are naturally labeled by the pipe dreams for $w$. In later work with Yong (2009), they used diagonal term orders to obtain alternative combinatorics for certain $X_w$. We present further results in this direction, with connections to a neglected Schubert polynomial formula of Lascoux (2002) in terms of the square-ice model (recently rediscovered by Lam, Lee, and Shimozono in the guise of “bumpless pipe dreams”). (Received September 17, 2019)