Assessing the Human Hazard from Impact-generated Tsunami

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We use recently published coastal population density data [1] and impact-generated tsunami rates [2] to develop a quantitative assessment of the tsunami risk posed by Earth impactors. We find that most tsunami damage can be associated with the more frequent impacts of smaller objects with sizes at or near the atmospheric penetration limit. Fully half of the impact tsunami hazard arises from objects smaller than 300m in diameter. Similarly, half of the tsunami risk stems from waves smaller than 11m high that should run in only 500-1000m from shore. In the mean, one million people are displaced by isolated tsunami events occurring 5200 years apart, and 182 people will be displaced annually by such catastrophes. Error analyses indicate the 90% confidence interval for this result is 59-379 people displaced per year.

[1] Small, C., V. Gornitz and J. Cohen, Environmental Geosciences, vol. 7, 3--12 (2000).
[2] Ward, S.N. and E. Asphaug, Icarus, vol. 145, 64--78 (2000) .