KINETIC ENERGY

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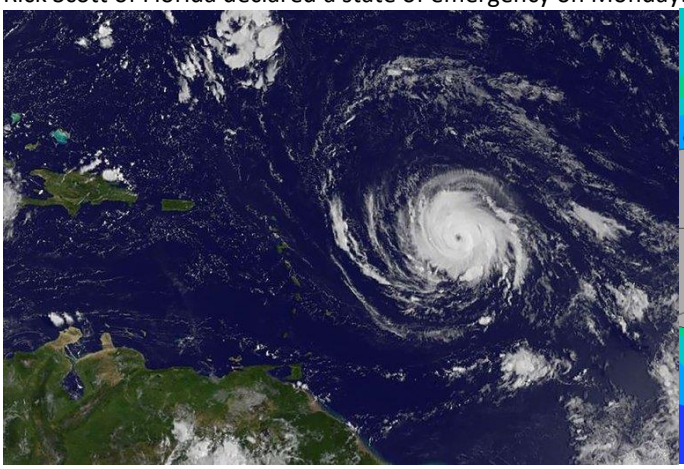
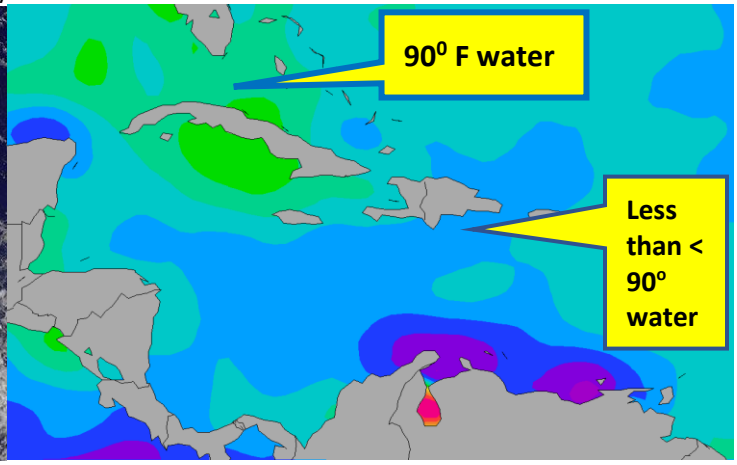
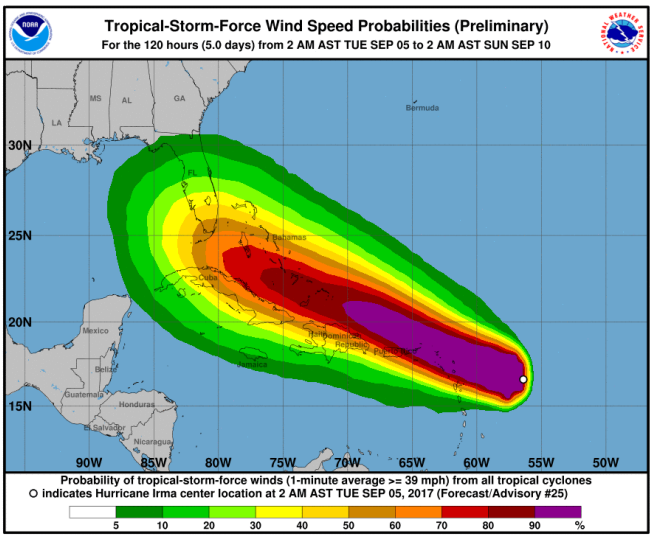
Maps: Tracking the Path of Hurricane Irma

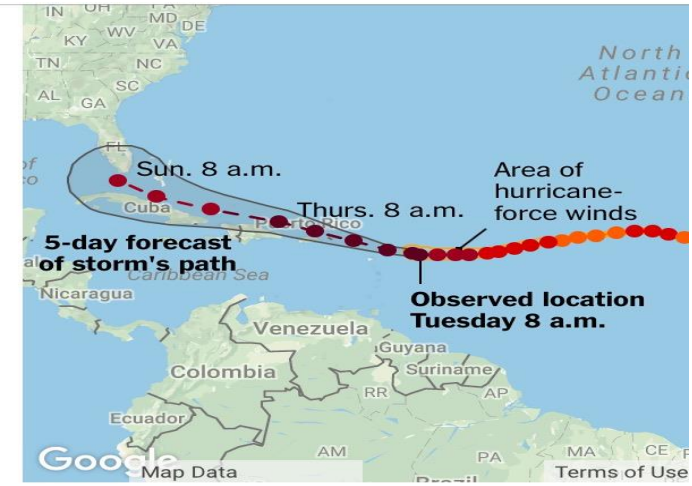
Hurricane Irma, which the National Hurricane Center is calling "an extremely dangerous" Category 5 storm, is headed west toward the Caribbean islands and could make landfall in South Florida this weekend. All times in the map below are Eastern. Recent forecasts showed that the storm would pass over Puerto Rico midday Wednesday and possibly hit South Florida on Sunday. Gov. Rick Scott of Florida declared a state of emergency on Monday.





Wind speeds have reached 175 miles per hour.





National Weather Service

INTRODUCTION: **Hurricane Irma is moving west in the Caribbean Sea where water is warmer (see graphics above). Hurricanes get their energy from the water, With warmer water Irma has been intensifying in speed. More speed indicates higher kinetic energy. Purpose of this application is to show that as speed of wind increases from : 100 mph – 140 mph – to 175 mph the energy of 175 mph hurricane is three times more energetic than 100 mph.**

QUESTIONS: **(a) Take mass of air to be m. Find kinetic energy of Irma when speed (v) is 100 mph?, (b) Find kinetic energy of Irma when speed (v) 140 mph?, (c) Find kinetic energy of Irma when wind speed (v) is 175 mph ? (d) Is 175 mph three times more energetic than 100 mph?**

HINTS: **Kinetic energy = ½ m v^2**

ANSWERS: **(a) 10,000 [m/2], (b) 19,600 [m/2] , (c) 30,625 [m/2], (d) Yes, 175 mph is three times more energetic than 100 mph. Even though the speed has not doubled (just 100 to 175 mph) the energy content is up by factor of three.**