Mathematical Modeling with DE's: Zombies

January 30, 2017

As you ease into a leather chair several sublevels below the White House you look up to see an ominous map of the United States surrounded by a mission control of computers and staff. On the map white light bulbs are illuminated throughout sectors of the country with one blinking red light in Southern California. The President leans heavily onto the massive oval table before him, his head bowed from the weight of the world on his shoulders. The Secretary of State hands you a file folder. You open it up and read this summary:

"Twelve days ago the United Nations received frantic communications from China reporting an epidemic wiping out their population. Due to the seriousness of the outbreak, the U.N. sent a multinational first response medical team into Chinas borders. The first reports were sketchy and confusing – images of the dead rising back to life and attacking other living people hit YouTube.

Five days ago a Chinese cargo ship was spotted on the horizon outside the San Diego Harbor. Within two hours a special forces team boarded the lifeless freighter to find hundreds of ferocious and agitated zombies. Several soldiers were wounded and medevaced to quarantine at Camp Pendleton outside San Diego. The wounded soldiers turned into ground zero for the zombie outbreak on U.S. soil. The base was lost and the infection is spreading through San Diego and Los Angeles. A combined Mexican-U.S. Military force has quarantined the greater Los Angeles-San Diego area – home to approximately 21 million residents."

As you complete the summary the President raises his head and stares you deep in the eyes. "We've brought you here from Atlanta because you are the CDC's leading epidemiology expert. The Secretary of State adjusts his glasses as he steps closer to you, "We need you to determine how fast this epidemic is spreading. All we know is the zombies appear to die after approximately 8 days and after 5 days we estimate 3,000 people have been infected."

Is there any hope for the Southern California coast, or will the entire population be wiped out?

Build a mathematical model that describes the zombie attack on the southern California coast. Make sure to clearly state all of your assumptions and label all pertinent information. Decide on if there is any hope for the Southern California coast based on your modeling? Keep in mind that the survival of the human race depends on your model.