



# CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

<b>Name(s)</b> <b>Xavier Brookes; Amanda Hunt</b>	<b>Project Number</b>  35768						
<b>Project Title</b> <b>Variation in Biogenic Sand along the Western Beaches of Okinawa, Japan</b>							
<table border="0" style="width: 100%;"><tr><td style="width: 33%; vertical-align: top;"><b>Objectives/Goals</b> Does the leeway coastal sand of Okinawa, Japan, along the East China Sea, transport from north to south due to the Black Current and other surface water processes? This experiment should prove that sand moves from north to south along the leeway coast due to the local surface currents which would greatly affect the coastal and marine ecology of the tropical, fringing reef island.</td><td style="width: 33%; vertical-align: top;"><b>Abstract</b> Does the leeway coastal sand of Okinawa, Japan, along the East China Sea, transport from north to south due to the Black Current and other surface water processes? This experiment should prove that sand moves from north to south along the leeway coast due to the local surface currents which would greatly affect the coastal and marine ecology of the tropical, fringing reef island.</td><td style="width: 33%; vertical-align: top;"><b>Methods/Materials</b> Seven sand were collected from isolated beaches along the western coastline. Each collection of sands was passed through several sized sieves. The mass of the different granule sizes was calculated on a digital balance. The mass of the different granule sizes were calculated on a digital balance to understand distribution of grain size and sorting. An average of 120 items in each sand were meticulously inspected and researched by microscope to include the following: texture (sphericity, clastic, variation, shape, roundness); biogenic content (general taxonomy). Hydrochloric acid was used to dissolve, measure, and inspect composition (biogenic, lithic fragments, human particles).</td></tr><tr><td style="vertical-align: top;"><b>Results</b> The texture of the sand grains was inconsistent; lithic fragments and major biogenic particles tended to be more angular in the south, with no real pattern for sphericity. Of the biogenic structures observed, there was a lack of diatoms and planktonic foraminifera, all of which were benthic. Spicules were present in certain beaches, with little to no correlation between them. There was no observable correlation between the compositions of lithic fragments either. According to the histogram of each beach, there is a high leptokurtic peak in ever sands except Bottle G, which was different on many accounts including a manganese coated surface concluding that it must be a paleo sand.</td><td colspan="2" style="vertical-align: top;"><b>Conclusions/Discussion</b> The presence of fragile biogenic creatures, lack of planktonic organisms; bathymetry; soft coral striations; lack of similar texture, composition, grain size, and sorting account for the determination that the motility is controlled by tidal motions. 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<b>Summary Statement</b> Sand motility related to the ecology of a tropical fringing reef island.							
<b>Help Received</b> Lab materials and initial mentoring from John-Henry Cottrell, a teacher at San Jacinto High School. Consulted Dr. W. B. Leatham, sedimentology professor at CSUSB, on gaps of knowledge and result clarifications.							