**Example Literature Review {CAUTION: Some notes may be direct quotes - remember to reword!}**

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| Folder  | File Name | Paper Title | Notes |
| Literature Review II | Global distribution Aedes\_Kraemer,2015 | The global distribution of the arbovirusvectors Aedes aegypti and Ae. albopictus | **Key terms:** * Aedes
* Global distribution
* environmental niches

**Background:*** Aedes socioeconomic factors affecting distribution
	+ use of air-conditioning
	+ housing quality
	+ rate of urbanisation
* This Study was able to integrate species-specific temp suitability covariate and anthro factors that influence Aedes (aegypti and albopictus)
* Used Boosted Regression Trees (BRT) probablistic species distribution model
	+ Env variables
	+ land-cover variables

**Content:*** Aedes aegypti predicted to occur primarily in the tropics and sub-tropics
* Temperature was the most important predictor - had high relative influence statistics for both sp
* Precip and vegetation indices made up the remainder of predictors
* Urban land cover made very little contribution to either model
* Used AUC to evaluate model’s predictive performance

**Take-Away:**  |
| Literature Review II | Relationships between climate and dengue using a water budgeting\_Schreiber,2001 | An investigation of relationships between climate and dengue using a water budgeting technique | **Key terms:** * Dengue
* Puerto Rico
* Water budget

**Background:****Content:****Take-Away:**  |
| Literature Review II | RS and Soil Moisture | Remote Sensing of Soil Moisture  | **Key terms:** **Background:****Content:****Take-Away:**  |
| Literature Review II | RS w\_Abundance ofPupae\_Moreno-Madriñán,2014 | Correlating Remote Sensing Data with the Abundance of Pupae of the Dengue Virus Mosquito Vector, Aedes aegypti, in Central Mexico | **Key terms:** **Background:****Content:****Take-Away:**  |
| Literature Review II | Geospatial Analysis Dengue | Geospatial analysis applied to epidemiological studies of dengue: a systematic review | **Key terms:** **Background:****Content:****Take-Away:**  |
| Literature Review II | Landscape and Bioclimatic Features to Predict the Distribution of Mammals\_Abade,2014 | Using Landscape and Bioclimatic Features to Predict the Distribution of Lions, Leopards and Spotted Hyaenas inTanzania’s Ruaha Landscape |  |
| Literature Review II | Weather variability Aedes aegypti Oviposition\_Estallo,2015 | Weather Variability Associated with Aedes(Stegomyia) aegypti (Dengue Vector)Oviposition Dynamics in NorthwesternArgentina | **Key terms:** **Background:*** regional specific studies of population dynamics are fundamental considering that populations of Ae. aegypti may show variations in behavior in different geographical areas

**Content:****Take-Away:**  |
| Literature Review II | Range Expansion\_NASA | Investigating the Potential Range Expansion of the Vector Mosquito Aedes aegypti in Mexico with NASA Earth Science Remote Sensing Results | **Key terms:** **Background:****Content:****Take-Away:**  |
| Literature Review II | Vegetation Analysis\_ENVI | Vegetation Analysis: Using Vegetation Indices in ENVI | **Key terms:** **Background:****Content:****Take-Away:**  |
| Literature Review II | Mapping dengue risk w\_RS | Mapping Entomological Dengue Risk Levels in Martinique Using High-Resolution Remote-Sensing Environmental Data | **Key terms:** **Background:****Content:****Take-Away:**  |
| Literature Review II | RS for mapping Malaria and Dengue\_Machult | Use of remotely sensed environmental and meteorological data for mapping malaria and dengue entomological risk | **Key terms:** **Background:****Content:****Take-Away:**  |
| Warning System / Prediction | Prediction Method Dengue RS\_Buczak,2012 | A data-driven epidemiological prediction methodfor dengue outbreaks using local and remotesensing data | **Key terms:** **Background:****Content:****Take-Away:**  |
| Warning System / Prediction | Early Warning Vector Disease\_Semanza,2015 | Prototype Early Warning Systems for Vector-Borne Diseasesin Europe | **Key terms:** **Background:****Content:****Take-Away** |
| Warning System / Prediction | Early Warning West Nile Vestor\_Rosa, 2014 | Early warning of West Nile virus mosquito vector:climate and land use models successfully explain phenology and abundance of Culex pipiens mosquitoes in north-western Italy | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Aedes Occurances\_Kraemer,2015 | The global compendium of Aedes aegypti and Ae. albopictus occurrence | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Maxent for Ecologists\_Elith,2011 | A statistical explanation of MaxEnt for ecologists | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Prediction Errors Presence Absence\_Fielding,1997 | A review of methods for the assessment of prediction errors inconservation presence/absence models | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | MaxEnt Biases Species Distribution\_Fourcade,2014 | Mapping Species Distributions with MAXENT Using aGeographically Biased Sample of Presence Data: A Performance Assessment of Methods for Correcting Sampling Bias | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | MaxEnt Distributions of Species\_Dissertation Princeton | MAXIMUM ENTROPY DENSITYESTIMATION AND MODELING GEOGRAPHIC DISTRIBUTIONS OF SPECIES | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | MaxEnt Math | Lecture 3: Maximum Likelihood/ Maximum Entropy Duality | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Maxent UCONN Slides | Introduction to MaxEnt | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Maxent\_tutorial | A Brief Tutorial on Maxent | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Practical Guide to MaxEnt for modeling species\_Merow,2013 | A practical guide to MaxEnt for modeling species’ distributions: what it does, and why inputs and settings matter | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Climate data and niche modeling\_Villegas,2009 | Working with climate data and niche modelingI. Creation of bioclimatic variables | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Predicting current and future potential distributions\_Slater, 2012 | Predicting the Current and Future Potential Distributionsof Lymphatic Filariasis in Africa Using Maximum EntropyEcological Niche Modelling | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | User\_Guide\_SDM\_in MaxEnt. | Chapter 5. Running a SDM in MaxEnt: from Start to Finish | **Key terms:** **Background:****Content:****Take-Away** |
| MaxEnt | Phyloclimatic study\_Yesson and Culham, 2006 | A phyloclimatic study of Cyclamen | **Key terms:** **Background:****Content:****Take-Away** |
| NDWI | NDWI\_Estallo\_2011 | Effectiveness of normalized differencewater index in modelling Aedes aegypti house index | **Key terms:** * Aedes aegypti
* NDWI
* Remote Sensing
* NDVI
* House Index

**Background:*** NDWI - vegetation liquid water
* House index - percentage of larvae-positive houses (entomologic survelliance)
* temp, humidity and precip sig influence development and survival
* generate predictive model for estimating larval indices considering environmental conditions
* NDWI increases as leaf area increases (total amount of liq water stacked in leaves)
* Veg water content also used to retrieve soil moisture the objective of this study was to test the effectiveness of NDWI and other satellite and meteorological data and to develop two forecasting models for A. aegypti HI in the city of San Ramón de la Nueva Orán

**Content:*** SAT and SATME models for estimating HI
* HI Forecast
	+ NDWI variance of the forest - lag 3 months
	+ mean NDWI of city lagged 3.5 months
* Temp and NDWI conditions recorded in an area determine vector population growth
	+ higher temperature → higher rate of reproduction and hatching, which would result in a greaternumber of mosquitoes per breeding site

**Take-Away:** * + Both humidity and rainfall should be used to model mosquito vector pop dynamics
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| NDWI | NDWI\_Gao\_1996 | NDWI A Normalized Difference WaterIndex for Remote Sensing of Vegetation Liquid Water From Space | **Key terms:** **Background:****Content:****Take-Away:**  |
| NDWI | NDWI\_SM\_waterGu\_et\_al\_2008 | Evaluation of MODIS NDVI and NDWI for vegetation droughtmonitoring using Oklahoma Mesonet soil moisture data | **Key terms:** **Background:****Content:****Take-Away:**  |
| NDWI | Urban Growth Monitoring\_NDWI\_Kamila,2015 | Urban Growth Monitoring and Analysis of Environmental Impacts on Bankura-I and II Block using Landsat Data | **Key terms:** **Background:****Content:****Take-Away** |
| NDWI | Modification of NDWI\_Xu,2006 | Modification of NormalizedDifference Water Index (NDWI) to Enhance Open Water Features inRemotely Sensed Imagery | **Key terms:** **Background:****Content:****Take-Away** |
| NDWI | NDWI\_NDVI\_SM\_Gu,2008 | Evaluation of MODIS NDVI and NDWI for vegetation droughtmonitoring using Oklahoma Mesonet soil moisture data | **Key terms:** **Background:****Content:****Take-Away** |
| NDWI | NDWI Swimming Pools Mosquitos\_McFeeters,2013 | Using the Normalized Difference Water Index (NDWI) within aGeographic Information System to Detect Swimming Pools for Mosquito Abatement: A Practical Approach. | **Key terms:** **Background:****Content:****Take-Away** |
| NDWI | RS NDWI Veg Liquid\_Gao | NDWI A Normalized Difference Water Index for Remote Sensing of Vegetation Liquid Water From Space | **Key terms:** **Background:****Content:****Take-Away** |
| Soil Moisture / Standing Water | RS and Soil Moisture\_Lakshmi, 2012 | Remote Sensing of Soil Moisture | **Key terms:** **Background:****Content:****Take-Away** |
| Soil Moisture / Standing Water | Standing Water Radar\_Elhassen,2013 | Standing Water Detection Using Radar | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Mapping Env Dengue Transmisison\_Arboleda, 2009 | Mapping Environmental Dimensions of Dengue Fever Transmission Risk in the Aburrá Valley, Colombia | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Pop Dynamis Aedes\_Barrera,2011 | Population Dynamics of Aedes aegypti and Dengue asInfluenced by Weather and Human Behavior in San Juan, Puerto Rico | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Geo-statistical Dengue Risk Model\_Tariq, 2014 | Geo-statistical Dengue Risk Model Case Studyof Lahore Dengue Outbreaks 2011 | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Aedes Temperature Survival\_Brady,2013 | Modelling adult Aedes aegypti and Aedes albopictus survival at different temperatures in laboratory and field settings | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Future Dengue Suitability\_Cardoso-Leite,2014 | Recent and future environmental suitability to dengue feverin Brazil using species distribution model | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Potential Geographic Distribution Triatoma Virus\_Ceccarelli, 2015 | Modelling the potential geographic distributionof triatomines infected by Triatoma virus in thesouthern cone of South America | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Costa Rica Veg and El nino\_Fuller, 2009 | El Niño Southern Oscillation and vegetation dynamics as predictors of dengue fever cases inCosta Rica | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Geospatial analysis dengue\_Oliveria | Geospatial analysis applied to epidemiological studies of dengue: a systematic review | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Climate Change Marine\_Jones, 2013 | Predicting the Impact of Climate Change on ThreatenedSpecies in UK Waters | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Predicting impact of Climate Change\_Khanum, 2013 | Predicting impacts of climate change on medicinal asclepiads ofPakistan using Maxent modeling | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | West Nile Eco Niche Modeling\_Larson,2009 | Ecological niche modeling of potential West Nile virus vectormosquito species in Iowa | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Climate\_Veg\_Pandemic\_Liu,2012 | Climate, vegetation, introduced hosts andtrade shape a global wildlife pandemic | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Modeling toold Dengue Risk Mapping\_Louis,2014 | Modeling tools for dengue risk mapping - asystematic review | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Mapping Dengue Suitability SDM\_Machado,2012 | Empirical mapping of suitability to dengue fever in Mexico using speciesdistribution modeling | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II |  Aedes and Human Density\_Padmanabha,2012 | The Interactive Roles of Aedes aegypti Super-Productionand Human Density in Dengue Transmission | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Density of Aedes and Humans\_Rodrigues,2012 | Density of Aedes aegypti and Aedes albopictusand its association with number of residents andmeteorological variables in the home environmentof dengue endemic area, São Paulo, Brazil | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | RS Monitoring Malaria Risk\_Ceccato,2005 | Application of Geographical Information Systems and Remote Sensing technologies for assessing and monitoring malaria risk | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II | Climate Change and Land Trnasformation on Banksia\_Yates,2010 | Assessing the impacts of climate changeand land transformation on Banksia in theSouth West Australian Floristic Region | **Key terms:** **Background:****Content:****Take-Away** |
| Literature Review II  | Models for Predicting A aepypti RS and Climate\_Estallo,2008 | MODELS FOR PREDICTING AEDES AEGYPTI LARVAL INDICES BASEDON SATELLITE IMAGES AND CLIMATIC VARIABLES | **Key terms:** Forecasting models, Aedes aegypti, larval indices, remote sensing, climatic variables**Background:*** abundant. In these environments, climatic variables such as temperature,humidity, and rainfall significantly influence mosquito development and survivorship
* Therefore, the NDVI, which measures vegetation greenness, is a proxy for soil moisture and land-surface wetness where areas with vegetation usually have NDVI > 0.
* brightness temperature is also a good estimator (Landsat images band 6) that gives an approximation of environmental temperature.

**Content:****Take-Away** |
| MaxEnt | 2015Fall\_GSFC\_MontanaEco\_TechPaper\_FD | Montana Ecological ForecastingUtilizing NASA Earth Observations to Forecast the Effects of Climate Change on Northern Goshawk Nesting Habitat | **Key terms:** Accipiter gentilis, Climate Change, Ecological Forecasting, Habitat Suitability, Lewis and Clark National Forest, Montana, Remote Sensing**Background:*** **Maxent** is a widely used program that estimates the probability distribution of a species using a maximum entropy approach, where the expected value of each environmental variable matches the empirical average

**Content:****HBM*** Used: **BioMapper, Maxent, and Mahalanobis Typicality**, and a **consensus map** was made to identify areas of suitable habitat for nesting goshawks
* Fire frequency and mountain pine beetle risk were used as ancillary data to determine the likelihood of available nesting habitat for the future under different climate change scenarios.
* Climate Change Scenarios were forecasted using ModelE/Russell Model (Goddard)
* Precipitation: Precipitation data was acquired from Precipitation Measurement Missions (PMM), Tropical Rainfall Measuring Mission (TRMM), and Global Precipitation Measurement (GPM), for the months of February to June, 2010 to 2015
	+ data sets were **downloaded** from the Science Team On-Line Request Module (**STORM**), a web-based data access interface hosted by NASA Goddard Space Flight Center (GSFC
* For creating a land cover map of the study area, three tiles of Landsat 8 data were mosaicked together
* Each data layer was subset to match the **spatial extent** of the LCNF
* **Biomapper**: based off of Ecological Niche Factor Analysis (ENFA), which computes the environmental factors that most explain the ecological distribution of the species
* **Mahalanobis Typicality -** expresses the likelihood that a set of environmental variables at a specific location is typical to the known location of the species, or that the species distribution is normal with respect to environmental gradients
* Otputs → sinlge composite model **Q: Same as consensus map?**
* **consensus map** was created showing a gradation of probabilities for nesting sites in the study area
	+ Created using mean pixel value from all 3 HSM
	+ classified using equal interval classification to display areas of: optimal/marginal/unsuitable nesting

**ECO FORECASTING*** Average monthly minimum temperature and precipitation data during the goshawk nesting season from February through June were collected for the years 2010 to 2015. Data from these five years were averaged for each month to create a baseline measurement of current conditions for comparison to climate model projections.
* datasets, which are in 2-3 degree spatial resolution, were downloaded from the WorldClim - Global Climate Data website after being averaged to the year 2050.
* forecasted what areas of the LCNF will be viable for nesting based on the current conditions and future scenarios
* we overlaid the mountain pine beetle risk map and the fire risk map to areas of optimal nesting habitat as determined by the aforementioned habitat suitability modeling.

**Take-Away*** Create LC map from Landsat
* Consensus Map
* Biomapper
* *QUESTION: the TP was in monthly averages, were all months put into the model at once?*
* *QUESTION: Could we do a continuous map with all of the case data (including monthly averages for the env variables)*
* *QUESTION: Are the output formats for the maps the same, easily combines into a consensus map?*
* Looked at Climate Change and Risks to habitat

**Cited Papers to Read**Hernandez, P. A., Franke, I., Herzog, S. K., Pacheco, V., Paniagua, L., Quintana, H. L., ... & Young, B. E. (2008). Predicting species distributions in poorly-studied landscapes. Biodiversity and Conservation, 17 (6), 1353-1366.Hirzel, A. H., Hausser, J., Chessel, D., & Perrin, N. (2002). Ecological-niche factor analysis: How to compute habitat- suitability maps without absence data? Ecology, 83 (7), 2027-2036. |
| MaxEnt | 2015Fall\_MSFC\_NorthMexicoEco\_TechPaper\_FD | North Mexico Ecological ForecastingUsing NASA Earth Observations to Monitor and Manage Ocelot Habitat Loss in North Mexico | **Key terms:** Ocelot, Remote Sensing, Conservation, Mexico, Population, Ecological Forecasting**Background / Content*** using remotely sensed data to delineate suitable habitat areas and examine where ocelots are most likely to be found in northeastern Mexico.
* **Landsat 5 and 8** were used to create supervised **land cover classification**s for 1996, 2004, and 2014 to **assess temporal changes.**
* Surface reflectance imagery from Terra and Aqua, as well as Suomi NNP, were used to derive a **Normalized Difference Vegetation Index (NDVI)** to **verify land cover classifications**. SRTM-v2 data was used to create digital elevation models.
* The land cover and elevation data, along with presence data and environmental variables, were analyzed by the **Princeton Maximum Entropy model and the “Fuzzy Logic”** tool to identify suitable ocelot habitat.
* **Project Objectives**
	+ Habitat Probability Maps (showed areas most likely to be inhabited by ocelots)
		- Future HBM - estimated habitat growth/loss
	+ Habitat Percent Cover Graph (past/present/future extenct of habitat)
	+ Future Habitat Probability Maps
	+ Road Risk Maps
* 1996, 2004, and 2014. These years were selected to show how **urbanization** and agricultural areas have grown and/or changed
* Landsat → Land cover classifications
* Suomi NPP Visible Infrared Imaging Radiometer Suite → (NASA land Web) derive NDVI
	+ *QUESTION: can we do this for NDWI?*
* Bioclim climatic variables downloaded from Worldclim Website (and future climate predictions)
* **Change in LC over study period**
	+ Composite bands tool → False Infrared Image
	+ Mosaiced
	+ Training samples for signature files
* **NDVI from VIIRS**
	+ NIR = band M7
	+ Red = band M4
	+ Georeferenced using ENVI classic → Geotiffs to Arc for Raster Calc
* **Distance to stream**
	+ Fill and Euclidian distance tools in ARC
	+ *QUESTION: could we do this with water source data*
* **MaxEnt** (used to determine areas most likely to contain ocelots)
	+ 19 Bioclimatic variables
	+ withheld 25% test data using subsampling method (was randomized for each replicate)
* **Fuzzy Logic Map** (determine areas most likely to contain ocelots)
	+ Used: distance to streams, slope, and distance to suitable habitat
* **Future Projections Map**
	+ used MaxEnt
	+ *QUESTION: did they use the “projection layer folder” option? Or were the projected variables just added into maxent normally?*
* **Habitat Percent Graph**
	+ percent of suitable habitat per year
* **Error Matrix**
	+ Accuracy
	+ Negative/Positive
	+ Misclassification
* **Errors and Uncertainty**
* **Take Away**
	+ Error Matrix
	+ Fuzzy Logic map
	+ Distance to \_\_ used in MaxEnt (we could use for water source)
	+ Land Cover Change (mapped using Landsat)
	+ percent suitable habitat
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