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PUBLICATIONS AND RESEARCH INTERESTS

PAPERS PUBLISHED BY DR. LAWRENCE F. ROBERGE

1. LAWRENCE F ROBERGE (2014) CHIKUNGUNYA VIRUS (CHIKV): COMING TO AMERICA. BIOSAFETY 3:E149. DOI: 10.4172/2167-0331.1000E149.

2. ROBERGE LAWRENCE F (2013) BLACK BIOLOGY-A THREAT TO BIOSECURITY AND BIODEFENSE. BIOSAFETY 2:E139 DOI: 10.4172/2167-0331.1000E139 .

3. ROBERGE LF (2013) ANALYSIS OF INTRODUCED SPECIES AS A FORM OF BIOLOGICAL WEAPON: PART 1-THEORY AND APPROACHES. BIOSAFETY 2:107. DOI:10.4172/2167-0331.1000107.

4. ROBERGE LF (2013) ANALYSIS OF INTRODUCED SPECIES AS A FORM OF BIOLOGICAL WEAPON: PART 2-DETECTION AND COUNTERSTRATEGIES. BIOSAFETY 2:111. DOI: 10.4172/2167-0331.1000111.

5. ROBERGE, L.F. 2006, CHEMICAL WEAPONS, CATHOLIC SOCIAL THOUGHT, SOCIAL SCIENCE, AND SOCIAL POLICY: AN ENCYCLOPEDIA, ED., JOSEPH A. VARACALLI, STEPHEN M. KRASON, AND RICHARD S. MYERS (LANHAM MD: SCARECROW PRESS)

6. ROBERGE, L.F. 2006, BIOLOGICAL WEAPONS, CATHOLIC SOCIAL THOUGHT, SOCIAL SCIENCE, AND SOCIAL POLICY: AN ENCYCLOPEDIA, ED., JOSEPH A. VARACALLI, STEPHEN M. KRASON, AND RICHARD S. MYERS (LANHAM MD: SCARECROW PRESS)

7. ROBERGE, L. F., 2006, CLONING: SCIENTIFIC, TECHNOLOGICAL & ETHICAL CONSIDERATIONS, ST. JOHN'S JOURNAL OF LEGAL COMMENTARY, FALL 2005, 20, 1, 57-70.

8. FERRIS, C.F., AXELSON, J.F., MARTIN, A.M., ROBERGE, L.F.: VASOPRESSIN IMMUNOREACTIVITY IN THE ANTERIOR HYPOTHALAMUS IS ALTERED DURING THE ESTABLISHMENT OF DOMINANT/ SUBORDINANT RELATIONSHIPS BETWEEN HAMSTERS. NEUROSCIENCE 1989, 29, 3: 675-683.

RESEARCH INTERESTS

- FOLLOW NEW AND NOVEL FORMS OF BIOLOGICAL WEAPONS AND BIOTERRORISM TECHNIQUES.
- RESEARCH ON NEXT GENERATION BIOLOGICAL WEAPONS AND DEVELOPMENT OF COUNTERMEASURES AND DETECTION TECHNIQUES TOWARD THESE WEAPONS.
- EXPLORE NEW AND EMERGING INFECTIOUS DISEASES IN BOTH HUMANS, FOOD CROPS, ECOSYSTEMS.

RESEARCH INTERESTS

- EXPLORE THE IMPACT AND MECHANISMS OF INVASIVE SPECIES ON VARIOUS ECOSYSTEMS-INCLUDING THE USE OF ENVIRONMENTAL NICHE MODELING TOOLS.
- EXPLORE ISSUES OF BIOETHICS ON EMERGING TECHNIQUES AND TECHNOLOGIES.
- IMPACT OF BLACK BIOLOGY AND DO IT YOURSELF (DIY) BIOLOGICAL TECHNOLOGIES ON BIOSAFETY AND BIOSECURITY/BIODEFENSE.

EDUCATIONAL BACKGROUND

- ATLANTIC INTERNATIONAL UNIVERSITY, HONOLULU, HI
  - PH.D IN BIOLOGY: ADVISOR: DR. FRANKLIN VALCIN
  - DISSERTATION THESIS: INTRODUCED SPECIES AS A FORM OF BIOLOGICAL WEAPON

- FLORIDA COMMUNITY COLLEGE, JACKSONVILLE, FL
  - CERTIFICATE IN ONLINE PROFESSOR TEACHING AND INSTRUCTION

- UNIVERSITY OF MASSACHUSETTS MEDICAL SCIENCE SCHOOL, WORCESTER, MA
  MASTER'S OF SCIENCE IN BIOMEDICAL SCIENCES

- UNIVERSITY OF MASSACHUSETTS-AMHERST, AMHERST, MA
  BACHELOR OF SCIENCE IN PSYCHOLOGY
  BACHELOR OF SCIENCE IN ZOOLOGY, MINOR-CHEMISTRY

- BECKER COLLEGE, WORCESTER, MA
  CERTIFICATE IN BIOTECHNOLOGY STUDIES

EXAMPLE OF PRESENT RESEARCH

- THE FOLLOWING SLIDES ARE BASED ON PUBLISHED RESEARCH:
- PART 1-PAPER- ANALYSIS OF INTRODUCED SPECIES AS A FORM OF BIOLOGICAL WEAPON: PART 1-THEORY AND APPROACHES

  PART 2-PAPER- ANALYSIS OF INTRODUCED SPECIES AS A FORM OF BIOLOGICAL WEAPON: PART 2- STRATEGIES FOR DISCERNMENT OF AN ATTACK AND COUNTERMEASURES.

PURPOSE OF RESEARCH

- THE PURPOSE OF THIS RESEARCH WAS TO EXPLORE EVIDENCE THAT INVASIVE SPECIES (AKA NON INDIGENOUS SPECIES-NIS) COULD BE USED AS A BIOLOGICAL WEAPON (BW).
- PREVIOUS HISTORICAL EVENTS HAVE SUGGESTED A NIS-BW APPLICATION BY ECOTERRORISTS, BUT THIS RESEARCH EXPLORES THE PROCESS BASED ON METHODS USING ECOLOGICAL NICHE MODELING (ENM) THAT COULD BE USED TO DETERMINE NIS SUCCESS AND TARGET SELECTION.

NONCONVENTIONAL THREAT SIGNIFICANCE

- THIS RESEARCH IS SIGNIFICANT AS IT DESCRIBES A THREAT TO BIOSECURITY AND BIODEFENSE BY USING NIS IN BW ATTACKS TO VARIOUS TARGETS:
  - PUBLIC HEALTH
  - AGRICULTURAL COMMODITIES
  - ECOSYSTEMS /BIODIVERSITY RESOURCES
  - BIOFUEL FEED STOCKS
  - GLOBAL FOOD SUPPLIES

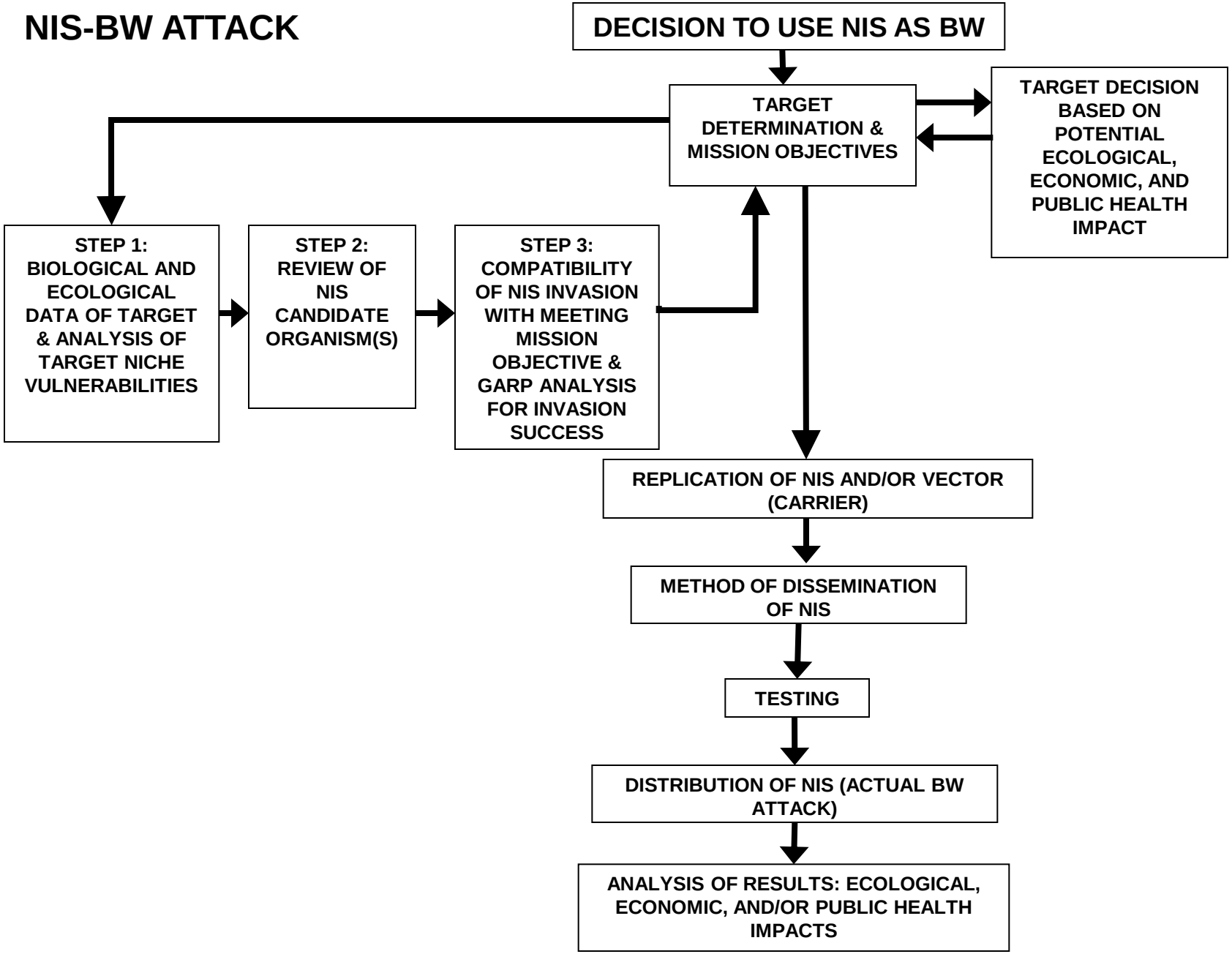
RESEARCH FINDINGS

- THE USE OF ECOLOGICAL NICHE MODELING SOFTWARE SUCH AS GARP (GENETIC ALGORITHM FOR RULE-SET PREDICTION) HAS FOUND PROMISE IN PREDICTING THE RANGE AND EFFECTIVE INVASIVENESS OF AN ORGANISM PRIOR TO THE ACTUAL INVASION –OR BW ATTACK!
- ALSO, IT MUST BE NOTED THAT USING INTRODUCED SPECIES IN A BW ATTACK AGAINST ECOSYSTEMS OR THE ACTUAL BIODIVERSITY OF A REGION OR NATION COULD BE A TARGET, ESPECIALLY IF THE ATTACK WAS INITIATED BY BIOTERRORISTS MOTIVATED TO INCITE FEAR AND SOCIAL UNREST IN THE TARGETED POPULACE OR NATION.

PROCESS OF ATTACK

- TWO MODELS ARE PRESENTED TO DESCRIBE THE PROCESS OF AN NIS-BW ATTACK BY HOSTILE ACTORS- ONE USING A SINGLE INVASIVE SPECIES AND ONE LEADING TO AN INVASION MELTDOWN OF THE TARGETED AREA.

EXAMPLE OF PROCESS OF NIS-BW ATTACK



EXAMPLES OF NIS BW WEAPONS

NIS SPECIES	DISEASE OR PATHOGEN TRANSMITTED	NIS BW TARGET(S)	RESULTS FROM ATTACK
FERAL PIGS	NIPAH VIRUS	HUMANS, CATTLE, WILDLIFE	HUMAN FATALITIES, CATTLES AND WILDLIFE MORTALITIES
TROPICAL BONT TICK	HEARTWATER PATHOGEN, EHRLICHIA RUMINANTIUM	WILDLIFE, CATTLE, POSSIBLY HUMANS	WILDLIFE MORTALITY, CATTLE LOSSES, POSSIBLE HUMAN DEATHS
STRIGA (AKA WHICHWEED)	STRIGA ITSELF IS A PLANT PARASITE- RESULTING IN CROP FAILURES	CORN, COWPEAS, SOYBEANS, RICE	SEVERE AGRICULTURAL LOSSES, FOOD SHORTAGES, DEVASTATED AGRICULTURAL COMMODITY MARKETS AND LOSS OF BIOFUEL PRODUCTION
BARBERRY PLANTS	WHEAT STEM RUST, PUCCINIA GRAMINIS	WHEAT CROPS	DESTRUCTION OF WHEAT HARVESTS, FOOD SHORTAGES, WHEAT EXPORT BOYCOTTS

DETECTION OF NIS-BW

- METHODS TO RULE OUT AN ACCIDENTAL INTRODUCTION FROM A DELIBERATE ATTACK ARE FIRST APPLIED.
- THEN THE KEY INDICATORS OF A NIS-BW ATTACK ARE:
- - UNCOMMON ROUTES OF ENTRY FOR THE NIS.
- - EXTREMELY HIGH RATES OF NIS PROPAGULES FOUND.
- - EVIDENCE OF NIS GENETIC ALTERATION.
- - HUMAN INTELLIGENCE (HUMINT) OF A PLANNED NIS-BW ATTACK OR EVIDENCE OF NIS CULTURING BY A NATION STATE OR AT A TERRORIST FACILITY.

COUNTERMEASURES FOR NIS-BW ATTACK

- COUNTERMEASURES FOR EITHER PREVENTION OR REMEDIATION FROM AN NIS-BW ATTACK INCLUDE:
- - EXPANSION OF NIS DATABASES OF KNOWN PREDATORS OF NIS ORGANISMS (E.G. BIOCONTROL)
- - ENHANCEMENTS OF NIS FIELD TRIAL RESEARCH.
- - EXPAND RESEARCH ON POTENTIAL NIS ORGANISMS USING ENHANCEMENTS TO ENVIRONMENTAL NICHE MODELING SOFTWARE.
- - NIS GENOMIC MAPPING-ESPECIALLY TO DETECT GENETICALLY ENGINEERED NIS-BW.

COUNTERMEASURES FOR NIS-BW ATTACK

- THE DETECTION OF GENETICALLY ALTERED NIS WOULD STRONGLY INDICATE THAT A NIS-BW ATTACK HAD OCCURRED.

- FURTHERMORE, REGARDLESS OF WHETHER THE IDENTITY OF THE ORIGINATOR OF THE NIS-BW ATTACK WAS KNOWN OR NOT, THE DISCOVERY OF A GENETICALLY ENGINEERED NIS-BW ATTACK MUST BE REPORTED TO THE BIOLOGICAL TOXINS AND WEAPONS CONVENTION (BTWC) FOR FOLLOW UP INVESTIGATION.

RESEARCH AWARD NOMINATION

- THIS RESEARCH WAS NOMINATED FOR THE 2014 NCT CBRNE COMMUNITY AWARD:
- LISTED AS: RESEARCH PAPER ‘INTRODUCED SPECIES AS A FORM OF BIOLOGICAL WEAPON’
- SEE WEB SITE: HTTP://WWW.NCTAWARDS.COM/VOTE-NOW/

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