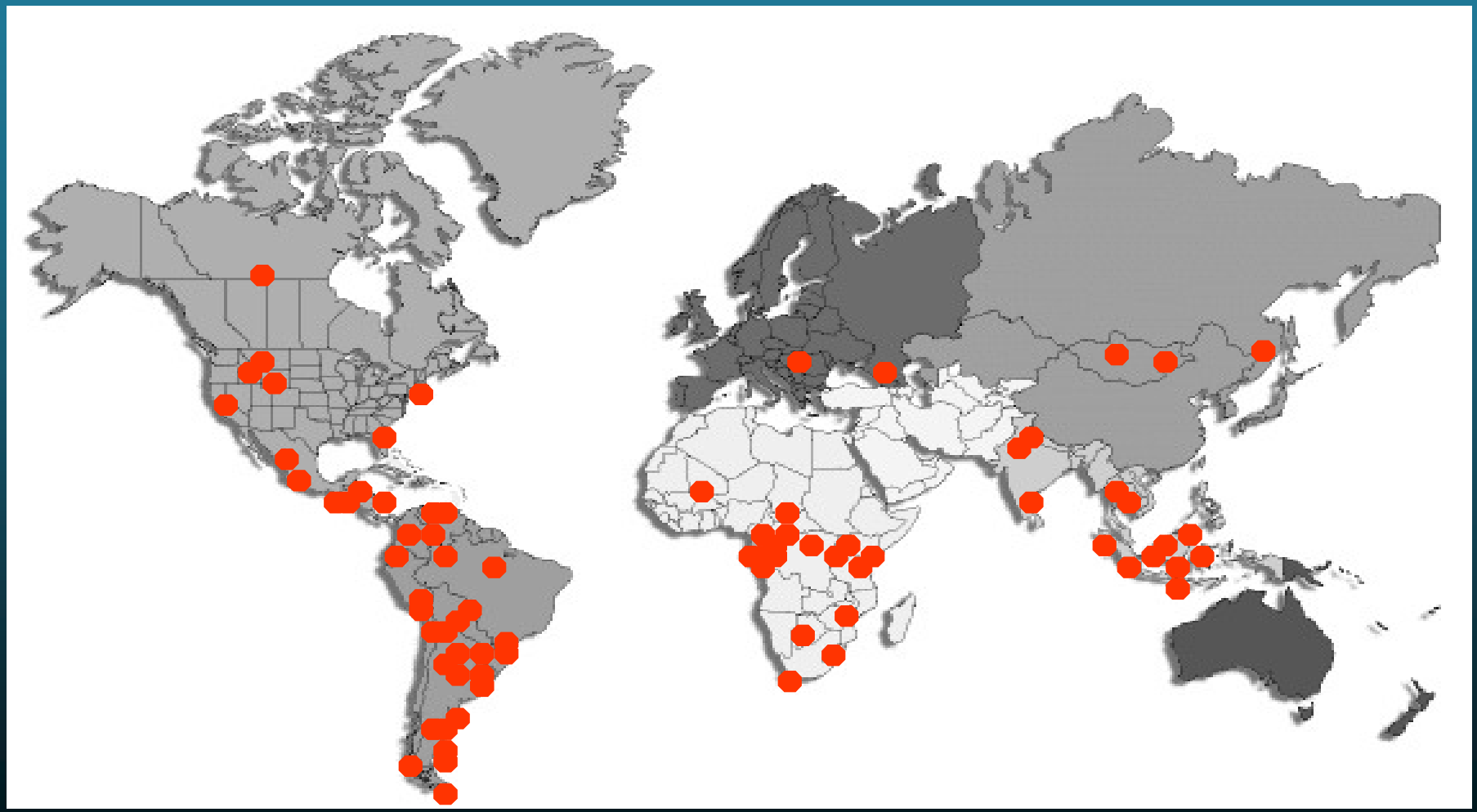
*Founded in 1895 as the*
*New York Zoological Society*

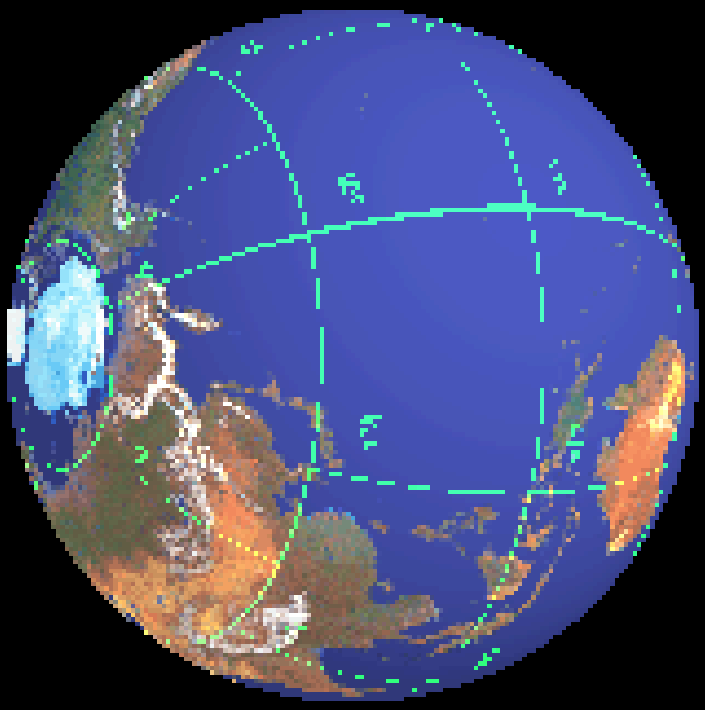
WILDLIFE CONSERVATION SOCIETY

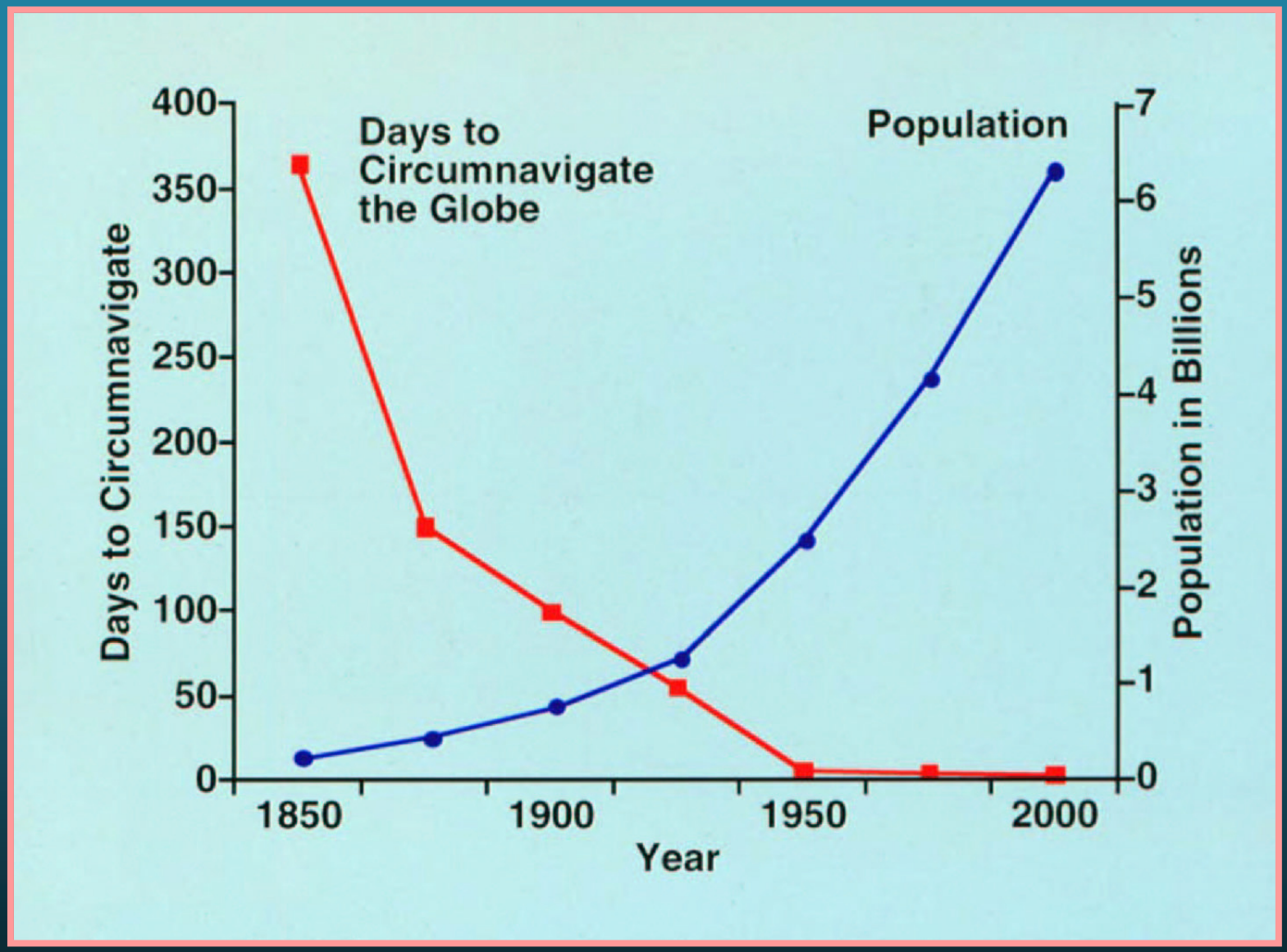
# *Health Programs*



WILDLIFE CONSERVATION SOCIETY

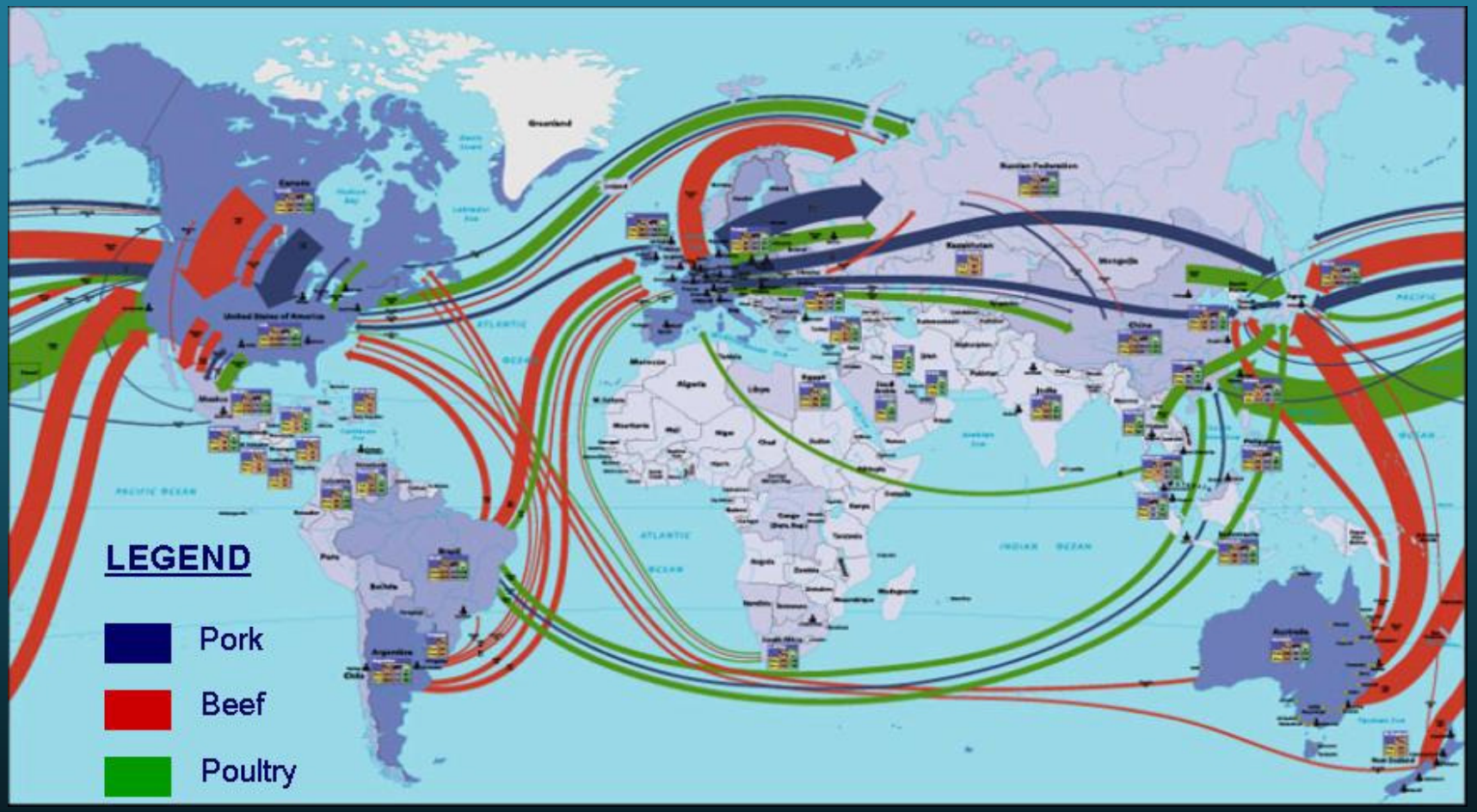
one world • one health





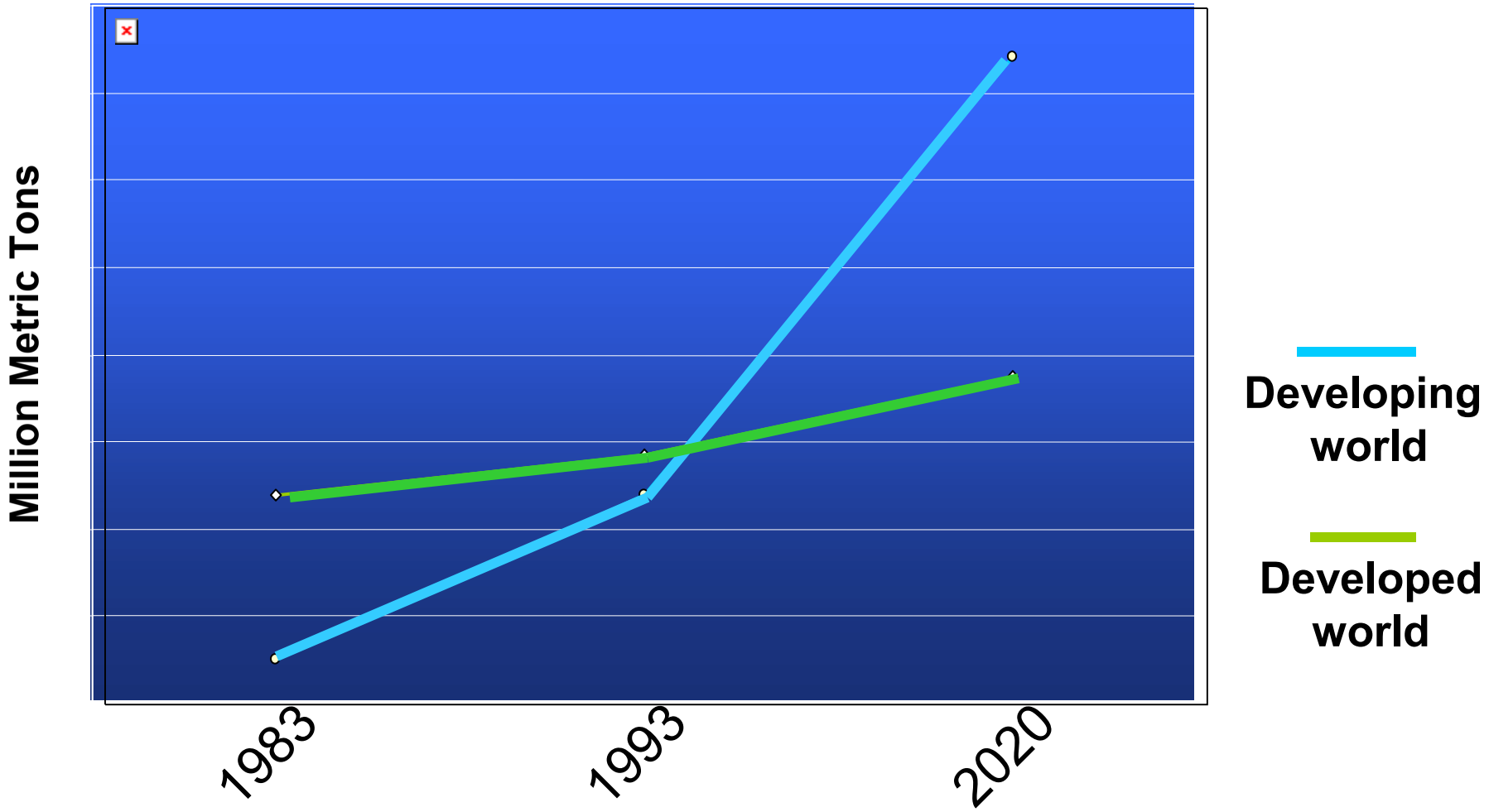

*Murphy and Nathanson, Semin. Virol. 5, 87, 1994*

# The Global Meat Trade is Highly Concentrated



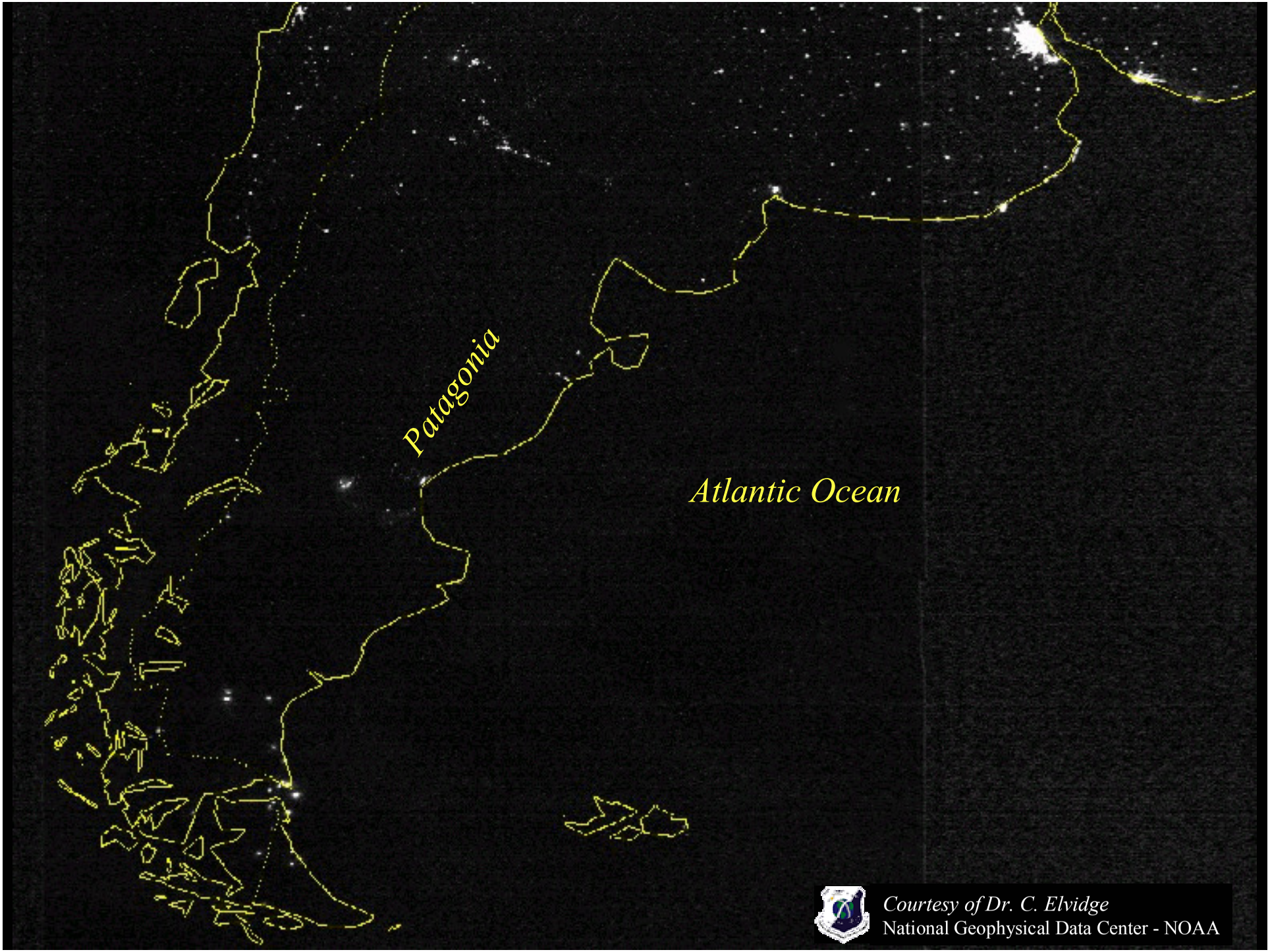

Source: Center for Global Food Issues

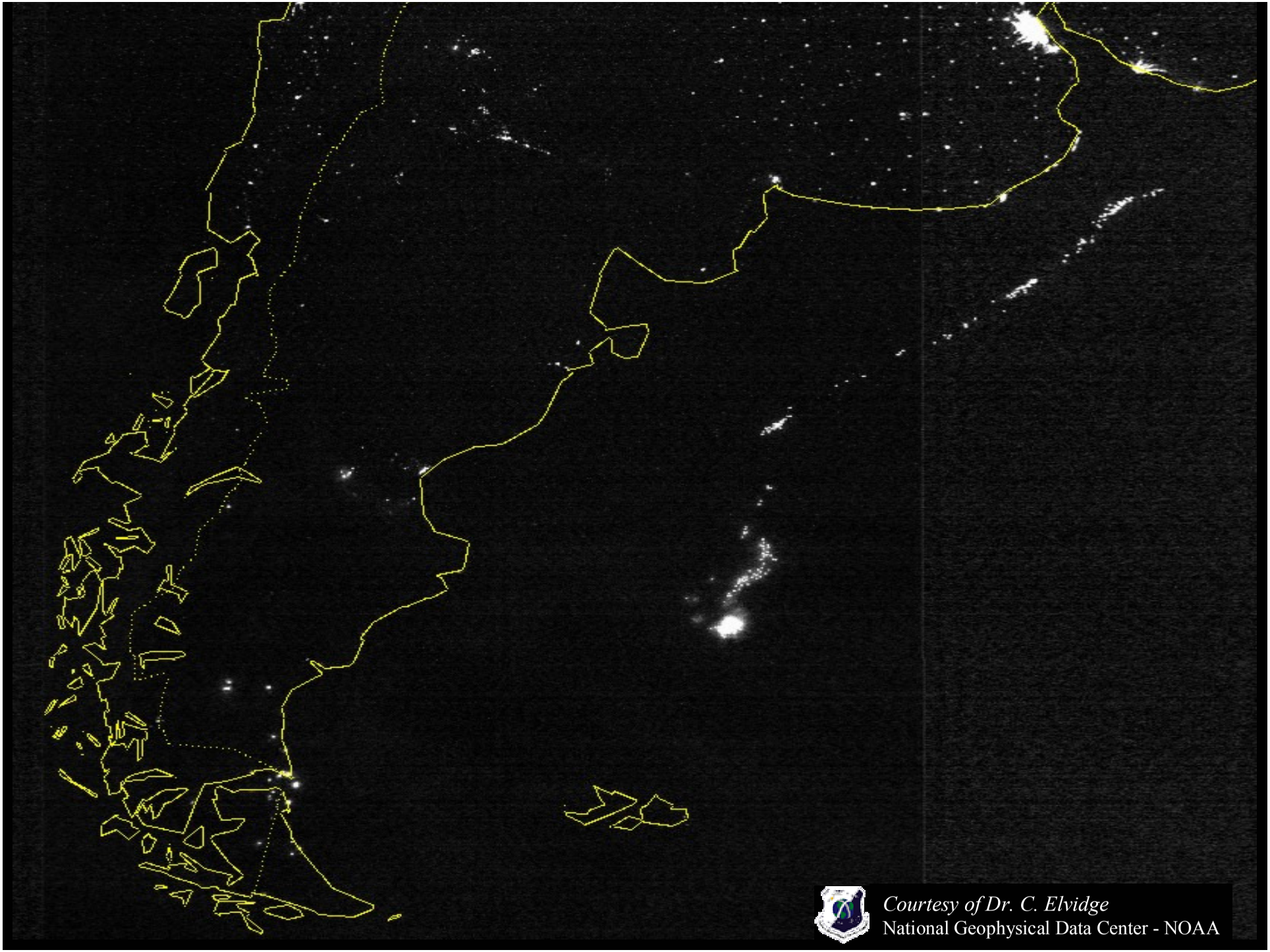
# World Meat Consumption: 1983-2020




Source: IFPRI, "Livestock to 2020: The Next Food Revolution"

FAO Annual Data. Total meat consumption for 1983 and 1993 are three-year moving averages.
2020 projections come from IFPRI's global model, IMPACT

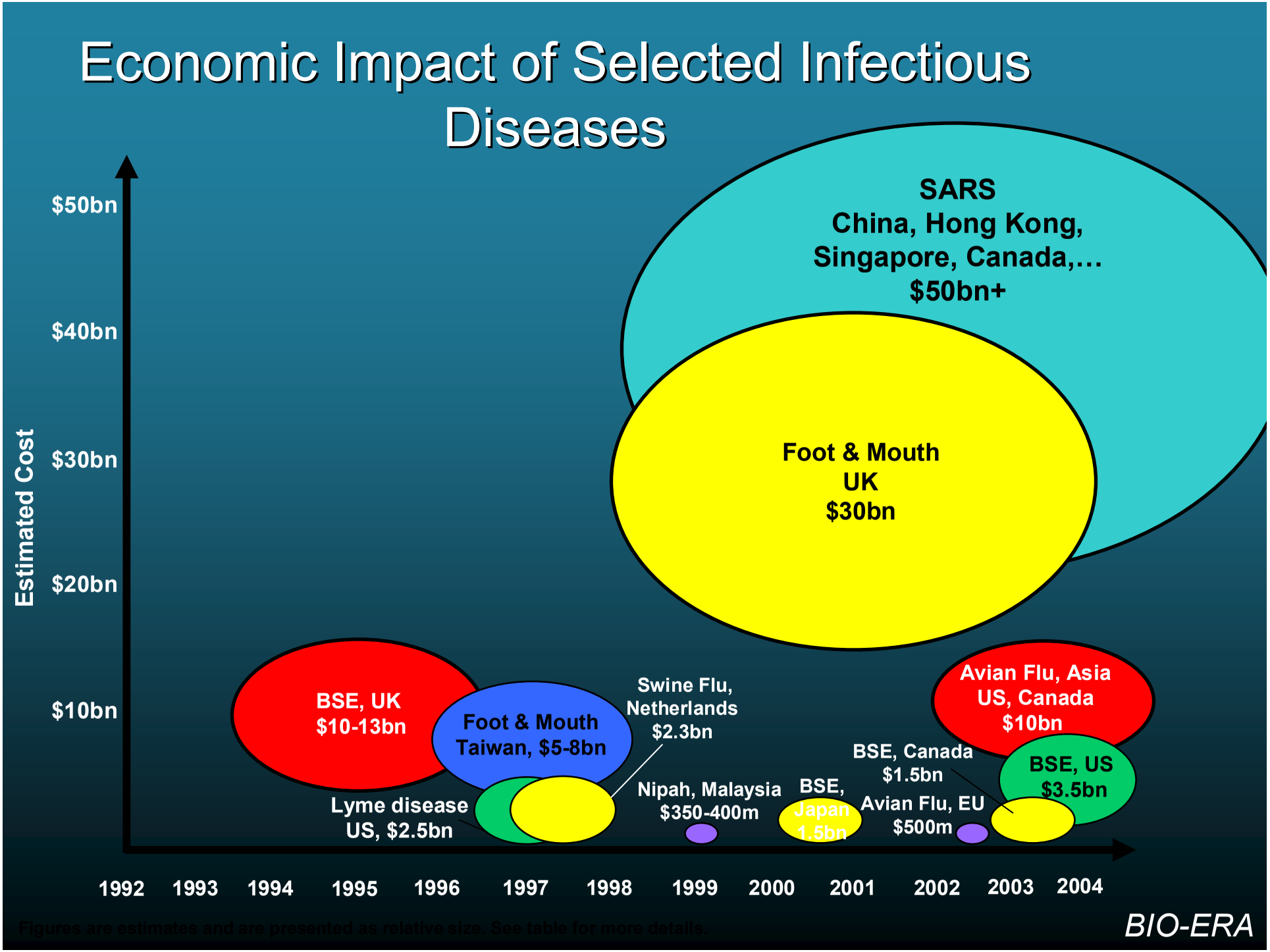

Patagonia
Atlantic Ocean
Courtesy of Dr. C. Elvidge
National Geophysical Data Center - NOAA


*Courtesy of Dr. C. Elvidge*
National Geophysical Data Center - NOAA

*E. A. Vigilancia Marítima*
Base Aeronaval Alte. Zar
Trelew - ARGENTINA

*E. A. Vigilancia Marítima*
Base Aeronaval Alte. Zar
Trelew - ARGENTINA

# Economic Impact of Selected Infectious Diseases

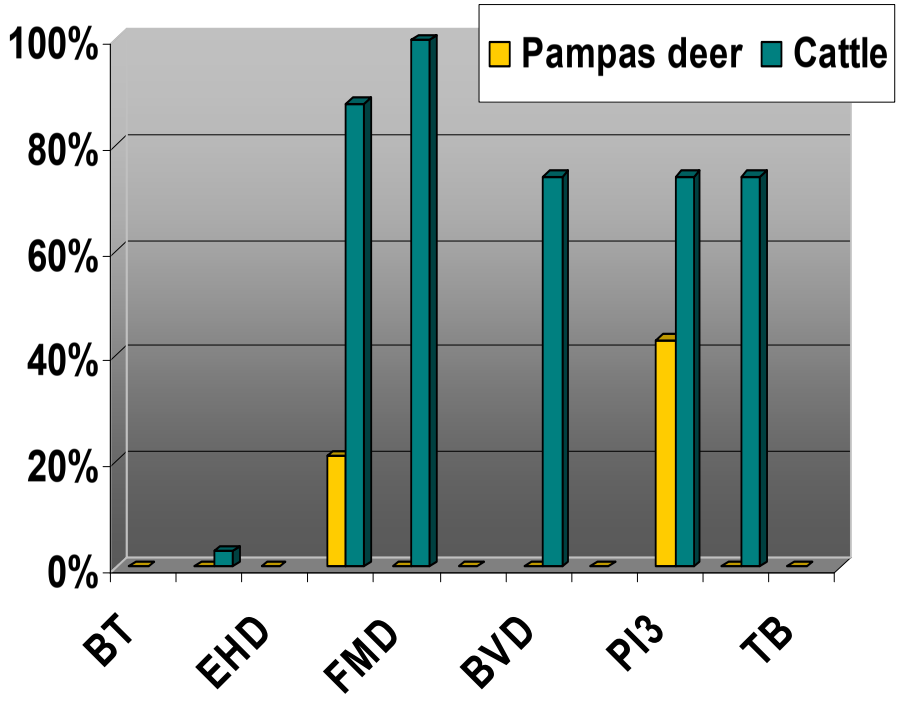



Figures are estimates and are presented as relative size. See table for more details.

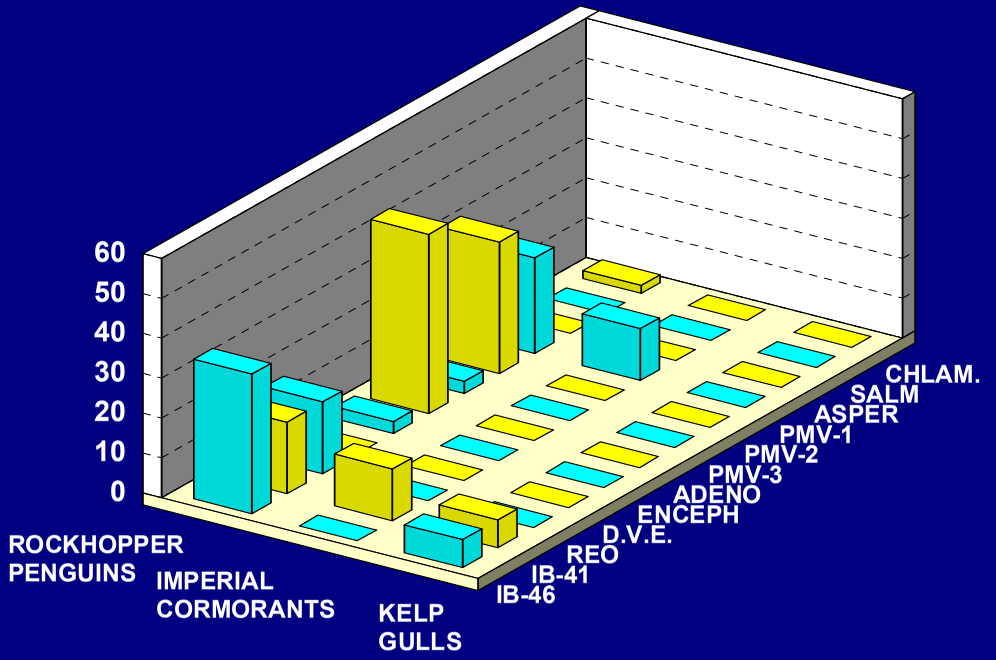
BIO-ERA

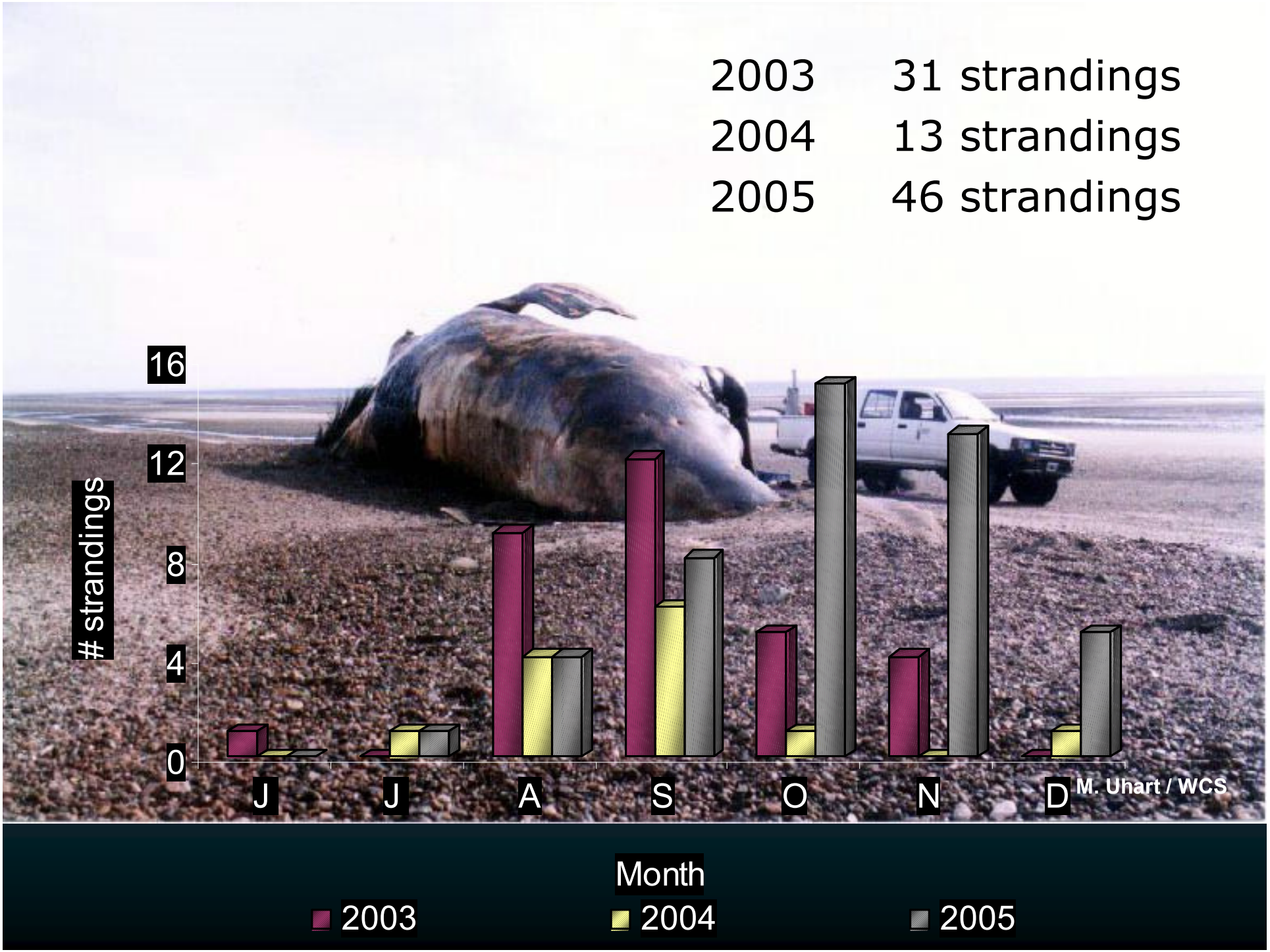
| Infectious Disease | Affects Wildlife | Affects Domestic Animals | Affects Humans Directly | Affects Human Livelihoods Indirectly |
|---|---|---|---|---|
| | | | | |
| Brucellosis | X | X | X | X |
| Canine Parvovirus | X | X | | |
| Chagas | X | X | X | |
| Distemper | X | X | | |
| Foot and Mouth Disease | X | X | | X |
| Leishmania | X | | X | |
| Leptospirosis | X | X | X | |
| Rabies | X | X | X | X |
| Scabies | X | X | X | |
| Toxoplasmosis | X | X | X | |

S. Osofsky / WCS


Pampas deer
Cattle
100%
80%
60%
40%
20%
0%
BT
EHD
FMD
BVD
PI3
TB

# Assessment & Monitoring




2003 31 strandings
2004 13 strandings
2005 46 strandings
16
12
8
4
0
# strandings
J
J
A
S
O
N
D
M. Uhart / WCS
Month
2003
2004
2005

# *Gorilla and Guerrilla Health*

# *Gorilla and Human Health*

C.A.R.
GABON
CONGO
D.R.C.

WILDLIFE
CONSERVATION
SOCIETY

U.S.
FISH & WILDLIFE
SERVICE

World Health Organization

CIRMF
GABON

IRD
Institut de recherche
pour le développement

CDC
Department of Health and Human Services
Centers for Disease Control and Prevention

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health

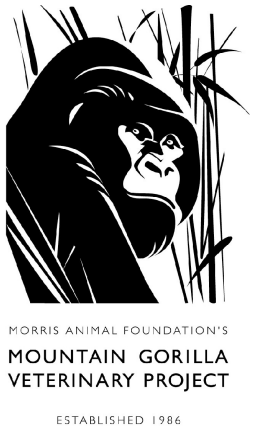
IUCN
The World Conservation Union

USAMRIID
United States Army Medical Research
Institute of Infectious Diseases

WWF

ECOFAC

ROBERT KOCH INSTITUT


MORRIS ANIMAL FOUNDATION'S
MOUNTAIN GORILLA
VETERINARY PROJECT
ESTABLISHED 1986

/ WCS

W. B. Karesh / WCS

Salmonella

Viral Diarrhea

Polio

Humans Colds Apes

Flu

Measles

Tuberculosis

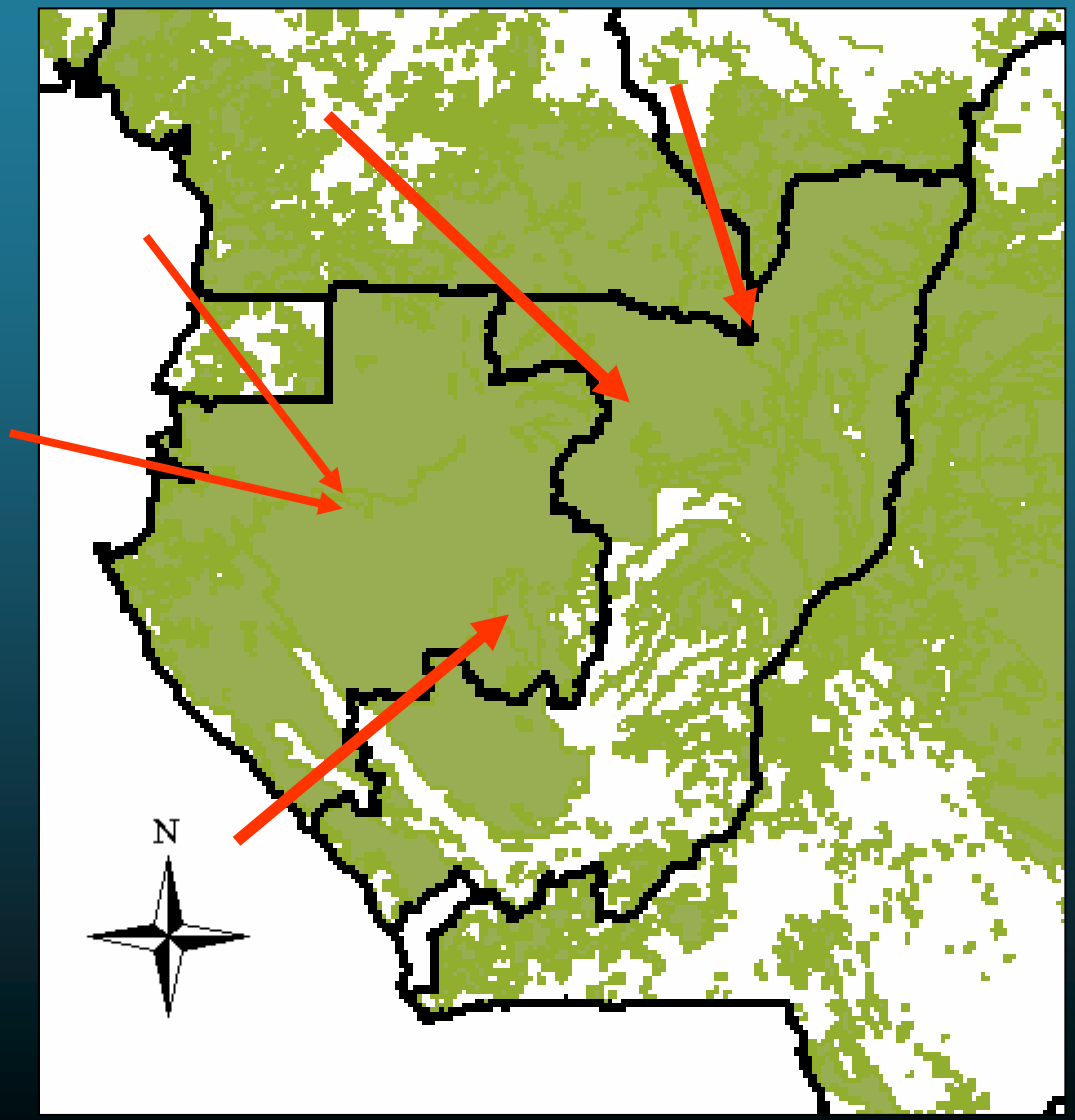
> 100 Others

A Kilbourn / WCS

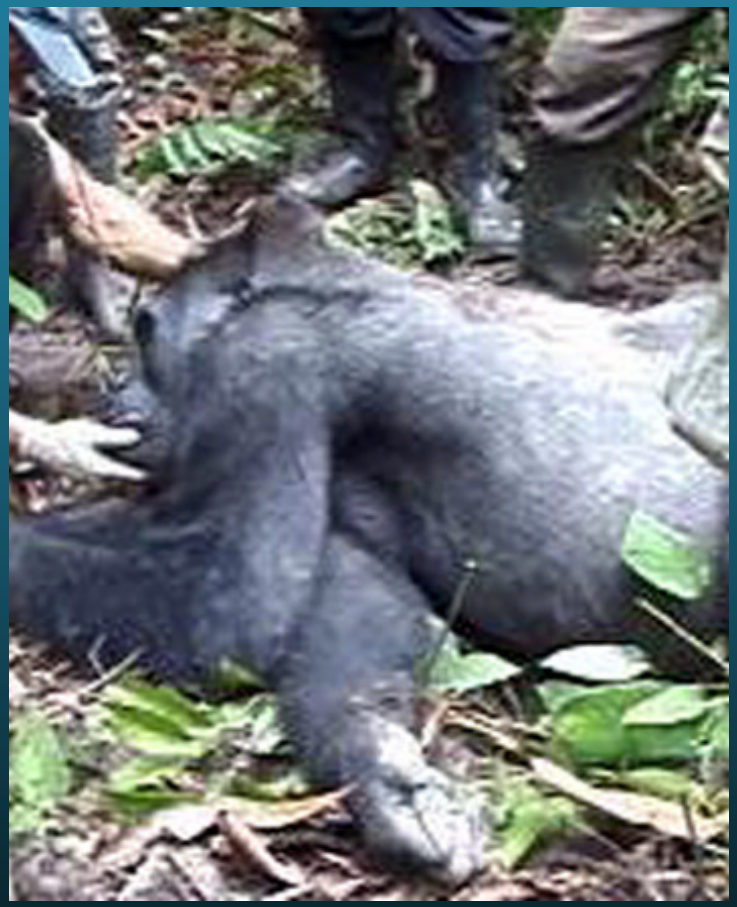
# *Capacity building*

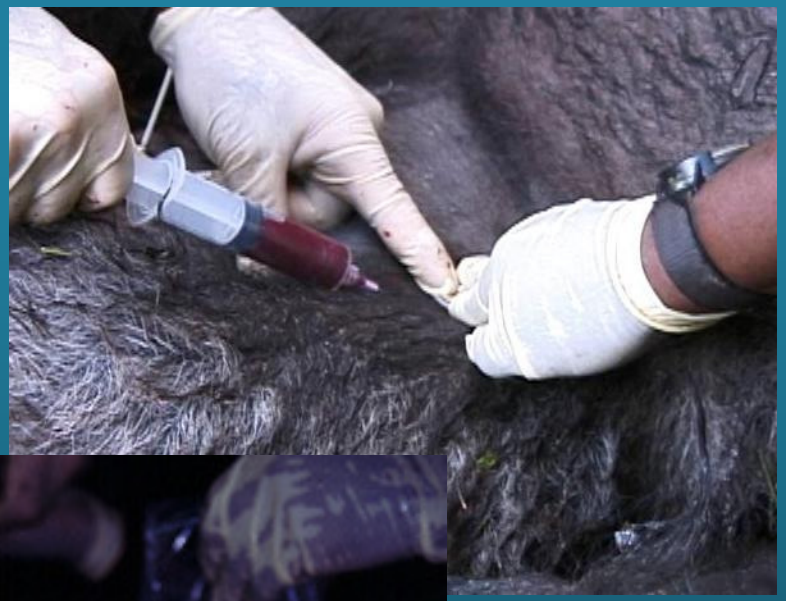
# Regional Field Laboratories

- **Parasitology**
- **Sample processing**
- **Exploring on-site Ebola diagnostics**
- **Training / capacity-building**
- **Community health support**



# *Hands-on work*





**Health examinations**

# *Serology - Positives*

**Herpes Simplex 1**

**Epstein Barr**

**Rubella**

**Hepatitis A**

**Hepatitis B (sAb)**

**Treponema**

Data suggest animals have **already** been exposed and have **some** immunity following exposure

# *Serology - Negatives*

**Polio**

**Measles**

**Ebola**

**Dengue Fever**

**Monkey Pox**

**Reovirus**

**Parvovirus**

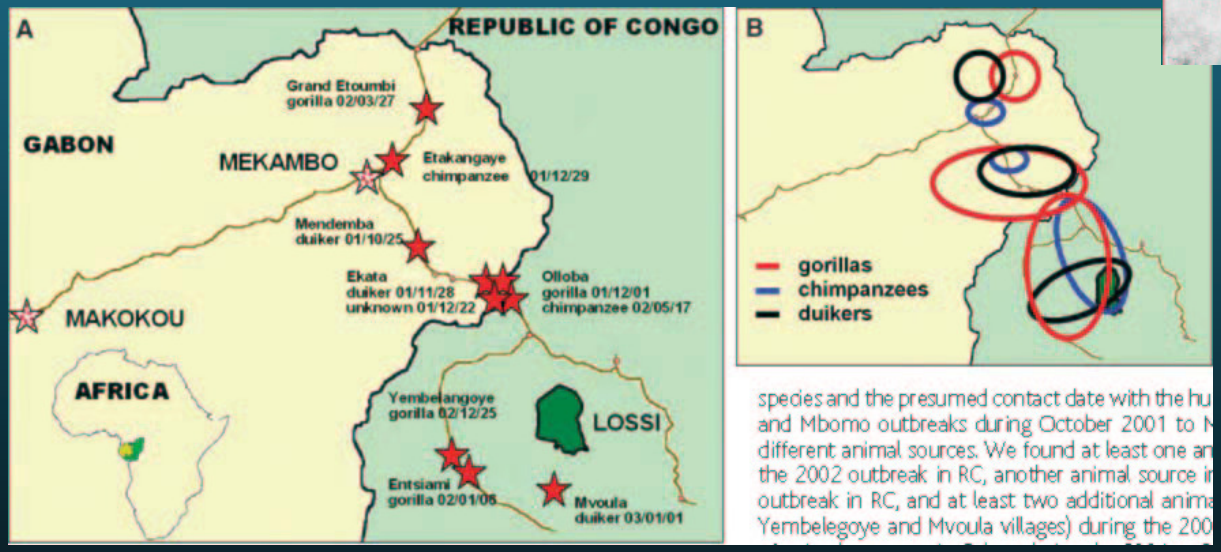
Data suggest animals have **NOT** been exposed and have **NO** immunity

# Disease outbreak Investigations & Post-mortem exams

SCIENCE, Jan 16, 2004

# Multiple Ebola Virus Transmission Events and Rapid Decline of Central African Wildlife

Eric M. Leroy,[1*] Pierre Rouquet,[2†] Pierre Formenty,[3†] Sandrine Souquière,[2] Annelisa Kilbourne,[4] Jean-Marc Froment,[5] Magdalena Bermejo,[5] Sheilag Smit,[6] William Karesh,[4] Robert Swanepoel,[6] Sherif R. Zaki,[7] Pierre E. Rollin[7]




species and the presumed contact date with the hu
and Mbomo outbreaks during October 2001 to N
different animal sources. We found at least one an
the 2002 outbreak in RC, another animal source i
outbreak in RC, and at least two additional anima
Yembelegoye and Mvoula villages) during the 200

# On-site diagnostics

**RAPID (rt-PCR)**

**ABICAP**

**EIA Corp.**
**Science Apps Int. Corp.**
**Idaho Tech., Inc.**
**KSU Nat. Ag. Biosec. Ctr**
**R.K.I.**

Ebola

Leptospirosis

Brucellosis

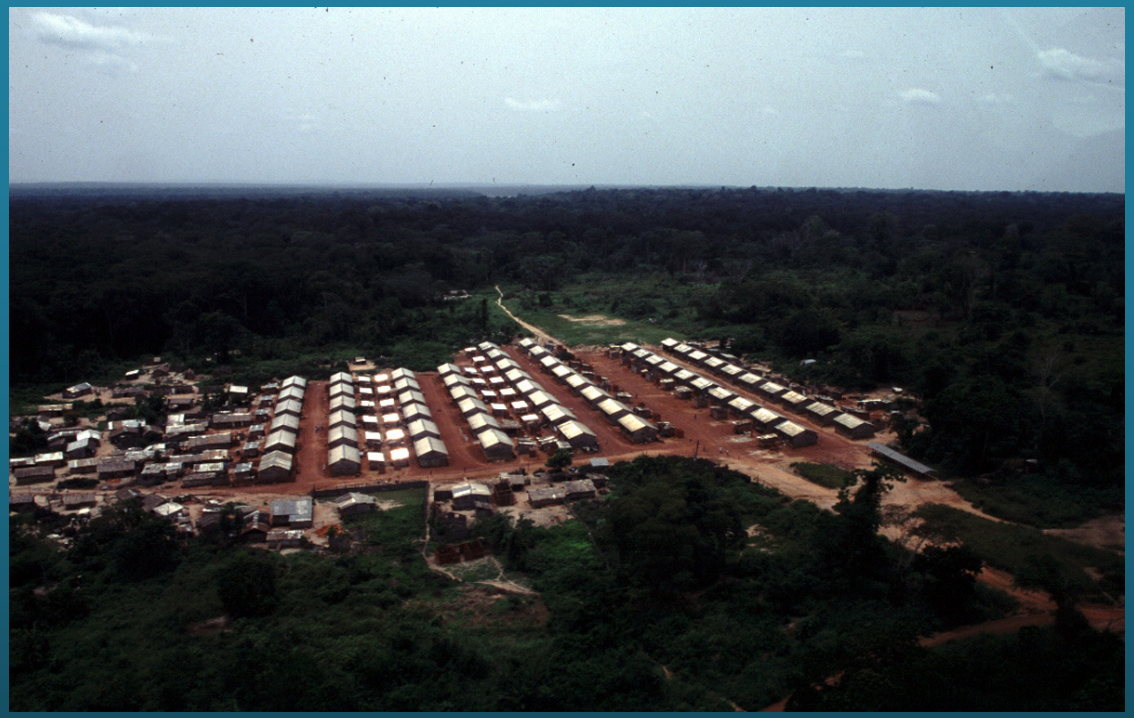
Animals Rabies Humans

Salmonella

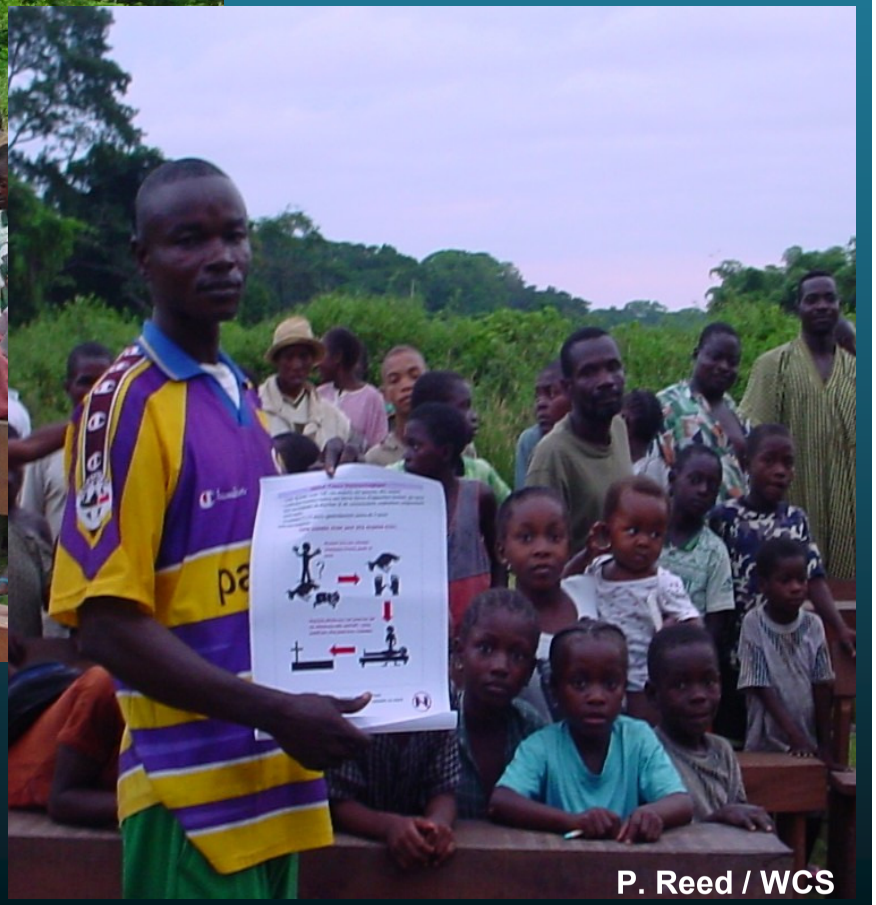
Monkeypox

Anthrax

> 800 Others

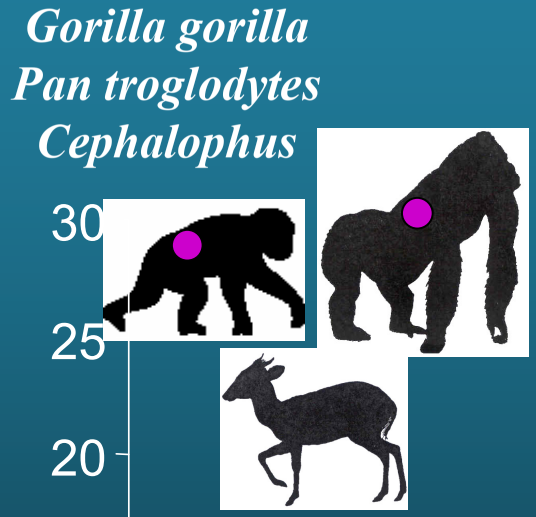


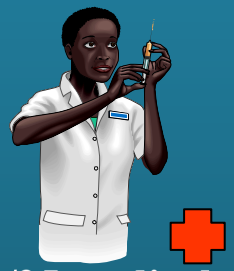
2,000,000,000 Lbs / Year
(Central Africa )



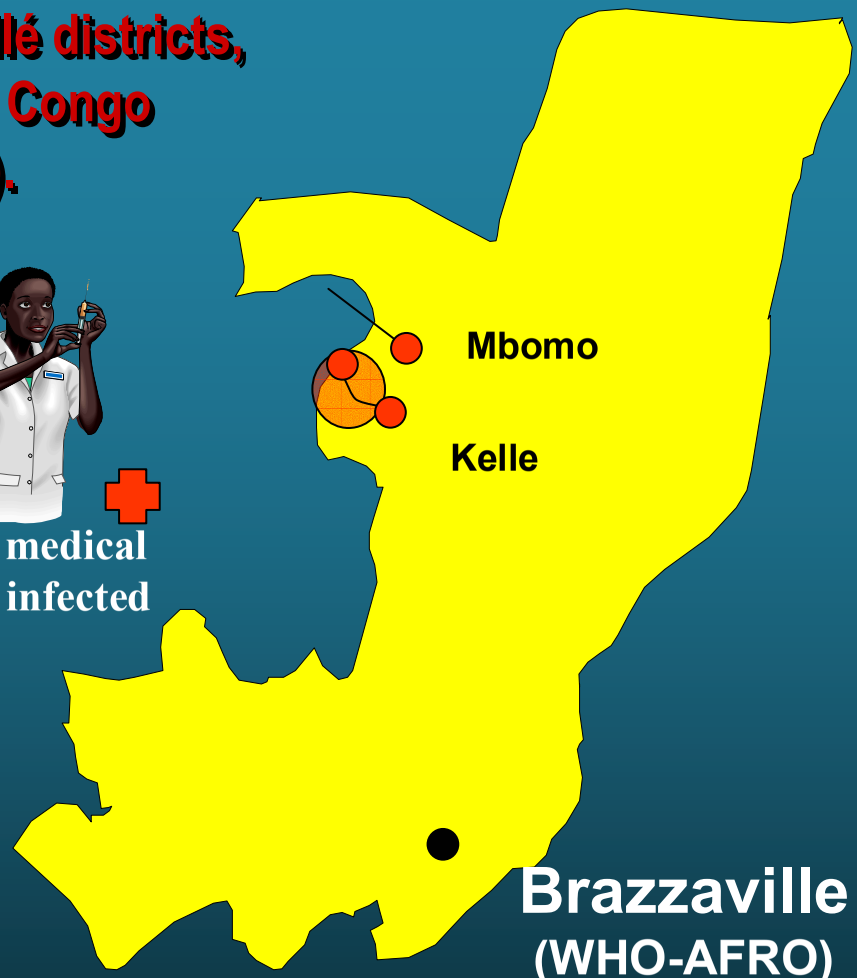
P. Reed / WCS

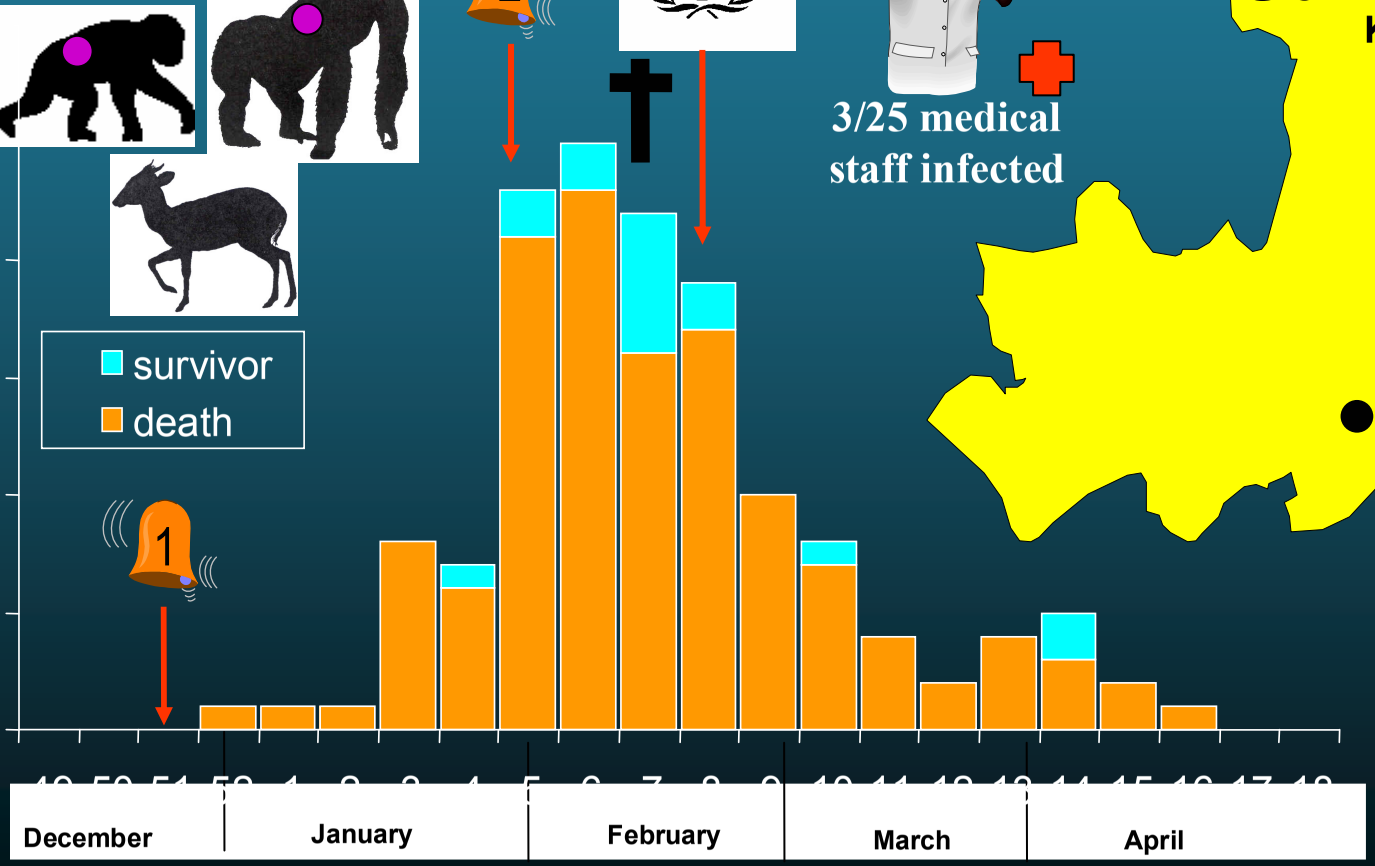
# Ebola outbreak in Mbomo and Kéllé districts, December 2002 to April 2003, Congo (143 cases, 128 deaths).





3/25 medical staff infected



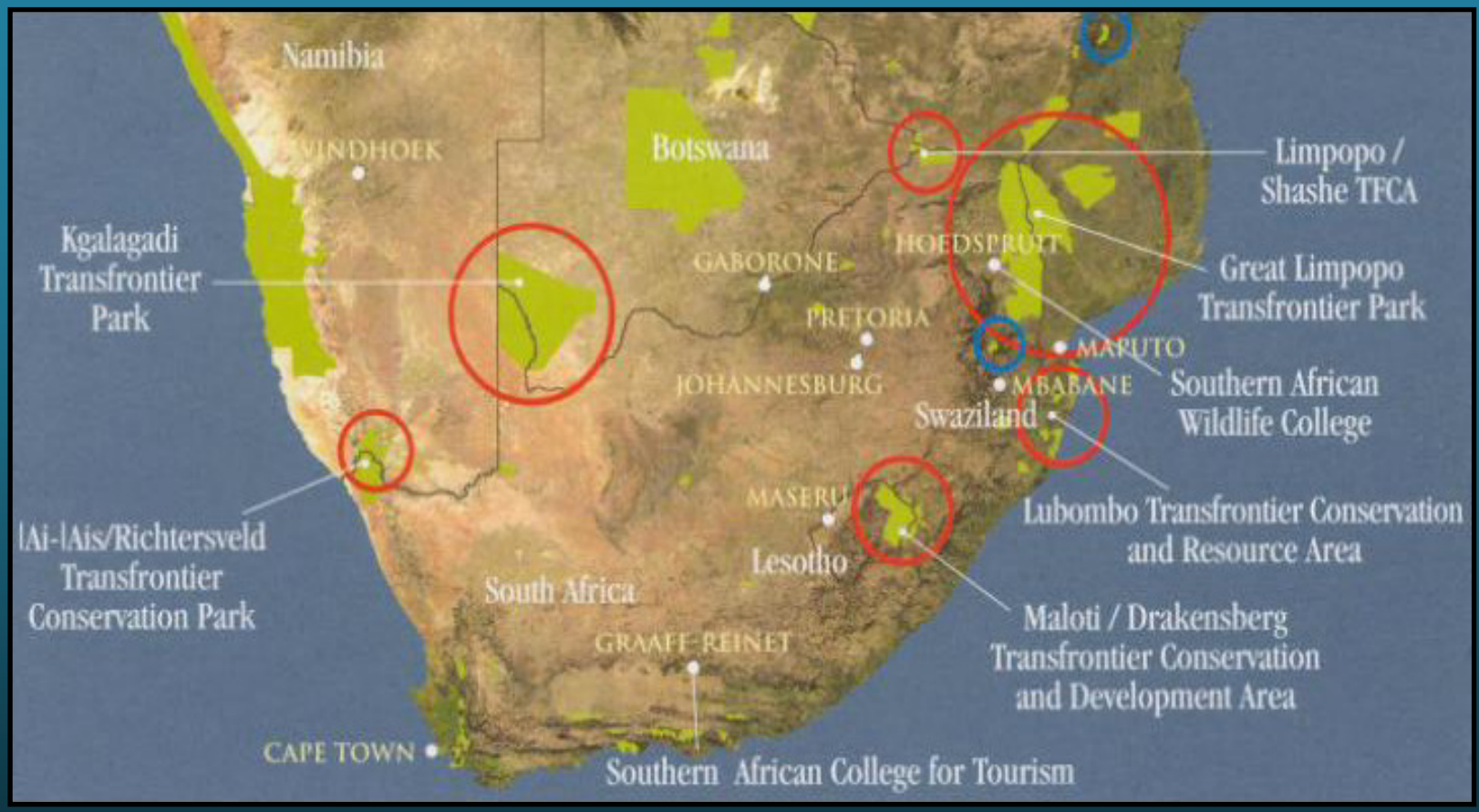



C. CAMERON / WCS

C. CAMERON / WCS

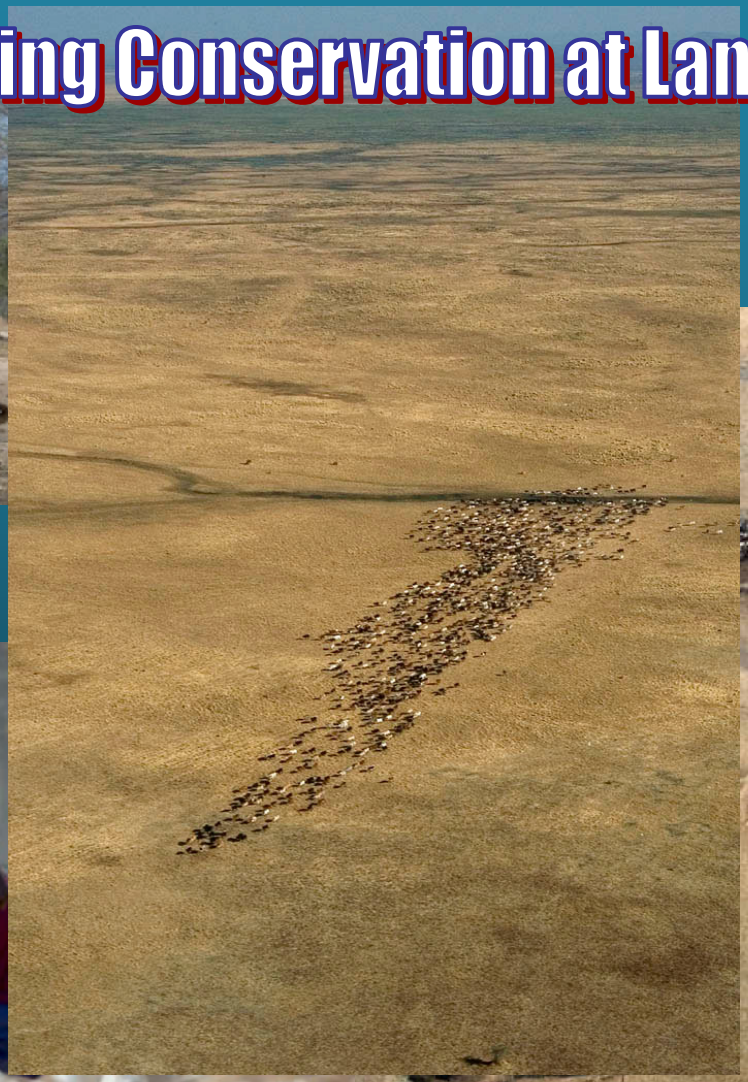
C. CAMERON / WCS

# *Guiding Policy*




# *AHEAD: Animal Health for the Environment And Development*

# Health and Disease at the Interface
# Driving Conservation at Landscape Scales



www.WCS-AHEAD.org

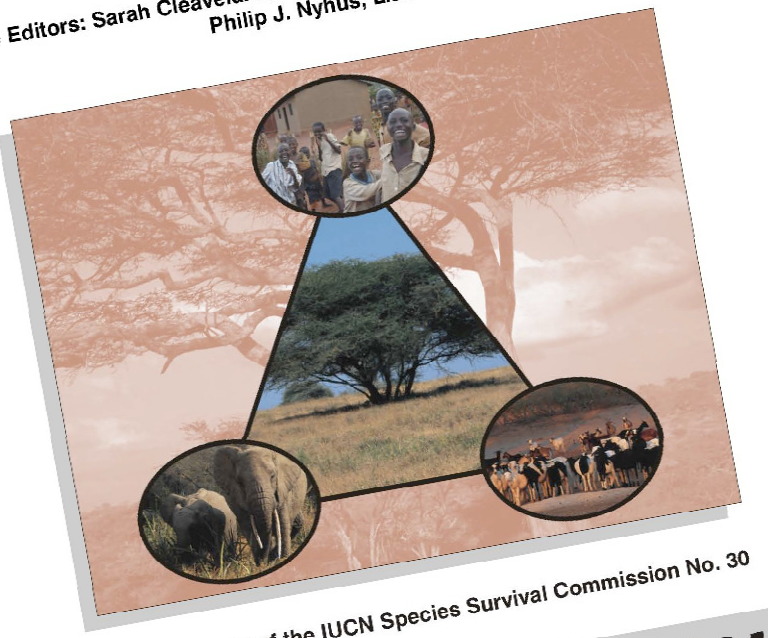
The IUCN Species Survival Commission

# Conservation and Development Interventions at the Wildlife/Livestock Interface

## Implications for Wildlife, Livestock and Human Health

Edited and compiled by Steven A. Osofsky

Associate Editors: Sarah Cleaveland, William B. Karesh, Michael D. Kock, Philip J. Nyhus, Lisa Starr and Angela Yang



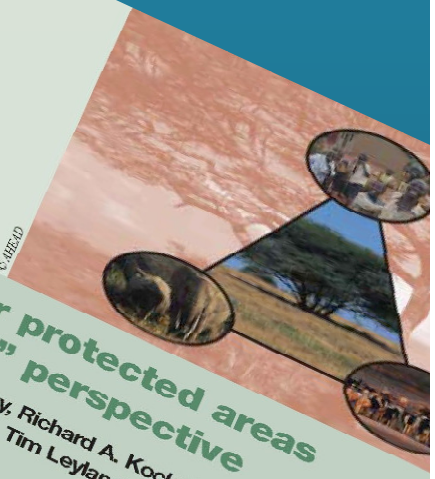
Occasional Paper of the IUCN Species Survival Commission No. 30

IUCN
The World Conservation Union

chapter 5

# Building support for protected areas using a "One Health" perspective

by Steven A. Osofsky, Richard A. Kock, Michael D. Kock, Gladys Kalema-Zikusoka, Richard Grahn, Tim Leyland and William B. Karesh

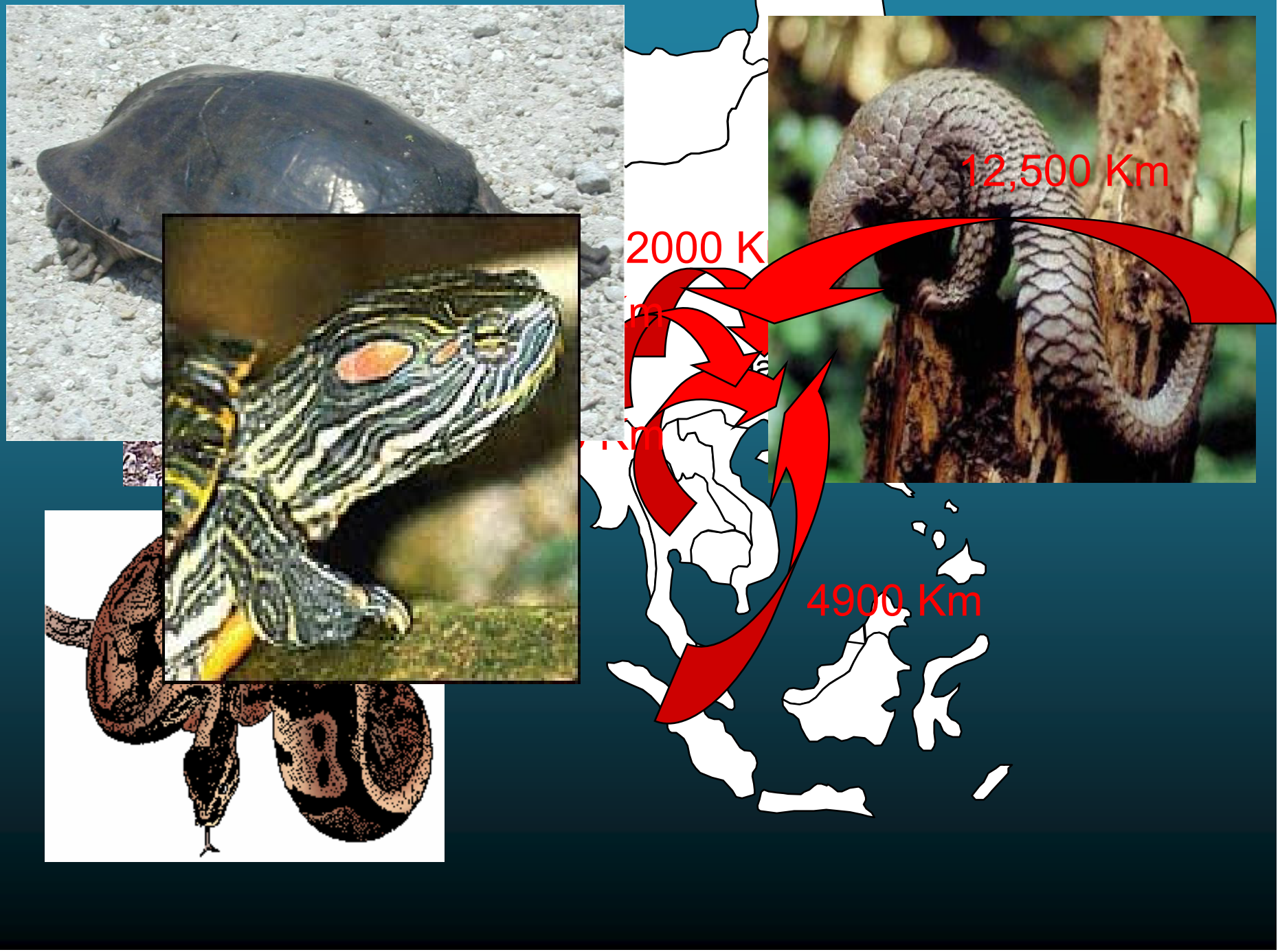


© AHEAD

## ditor's introduction

affecting the interplay among wildlife health, h of domestic animals, and human health are nadequate attention from protected area This chapter encourages an innovative lled the "One Health Paradigm" by ecological definition of health that my disciplines that too often have om each other. This ecosystem ues is especially pertinent in the are domestic animals often cies of greatest interest to Steve Osofsky and his rspective on the many h of wildlife and the often-remote areas uman health care is often in short supply. Building a more appropriate response to the problems of disease transmission across the interface between wildlife and domestic animals can also lead to improvements in the health status of the people living around protected areas, thereby building a more positive attitude towards the protected area and conservation authorities. This chapter also emphasises the highly dynamic relationship between people, domestic animals, and wildlife, calling for significant investments in training, monitoring and research in order to ensure a healthy outcome for all concerned. The elements in the "One Health" paradigm provide a solid basis for building support for protected areas from those living near them and those working on human and animal health.

M. Gilbert / WCS


12,500 Km
2000 K
4900 Km

# Is SARS from outer space?

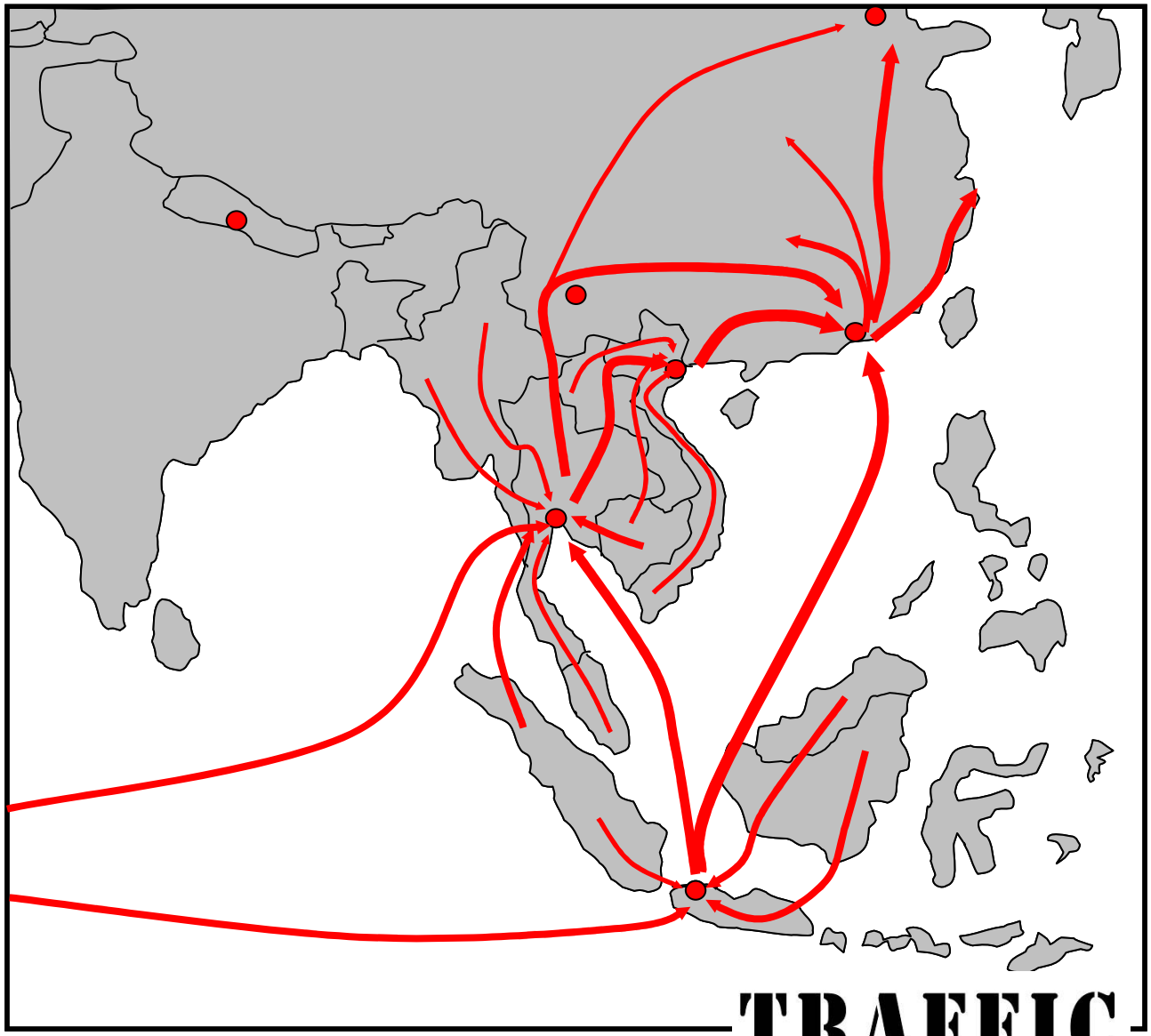
By Lauren Compton
**CNN**
Friday, May 23, 2003

**LONDON, England (CNN) –**

**The SARS virus might have originated in outer space, according to a scientist in Britain.**
In a letter to **The Lancet** medical journal, professor Chandra Wickramasinghe of Cardiff University suggests the virus was introduced to Earth on a comet or meteorite.

**70,000 birds,**
**276 species**
**sold in one Thai**
**market**
**over 25**
**weekends**

WILDLIFE CONSERVATION SOCIETY



TRAFFIC®

the wildlife trade monitoring network

World Parrot Trust

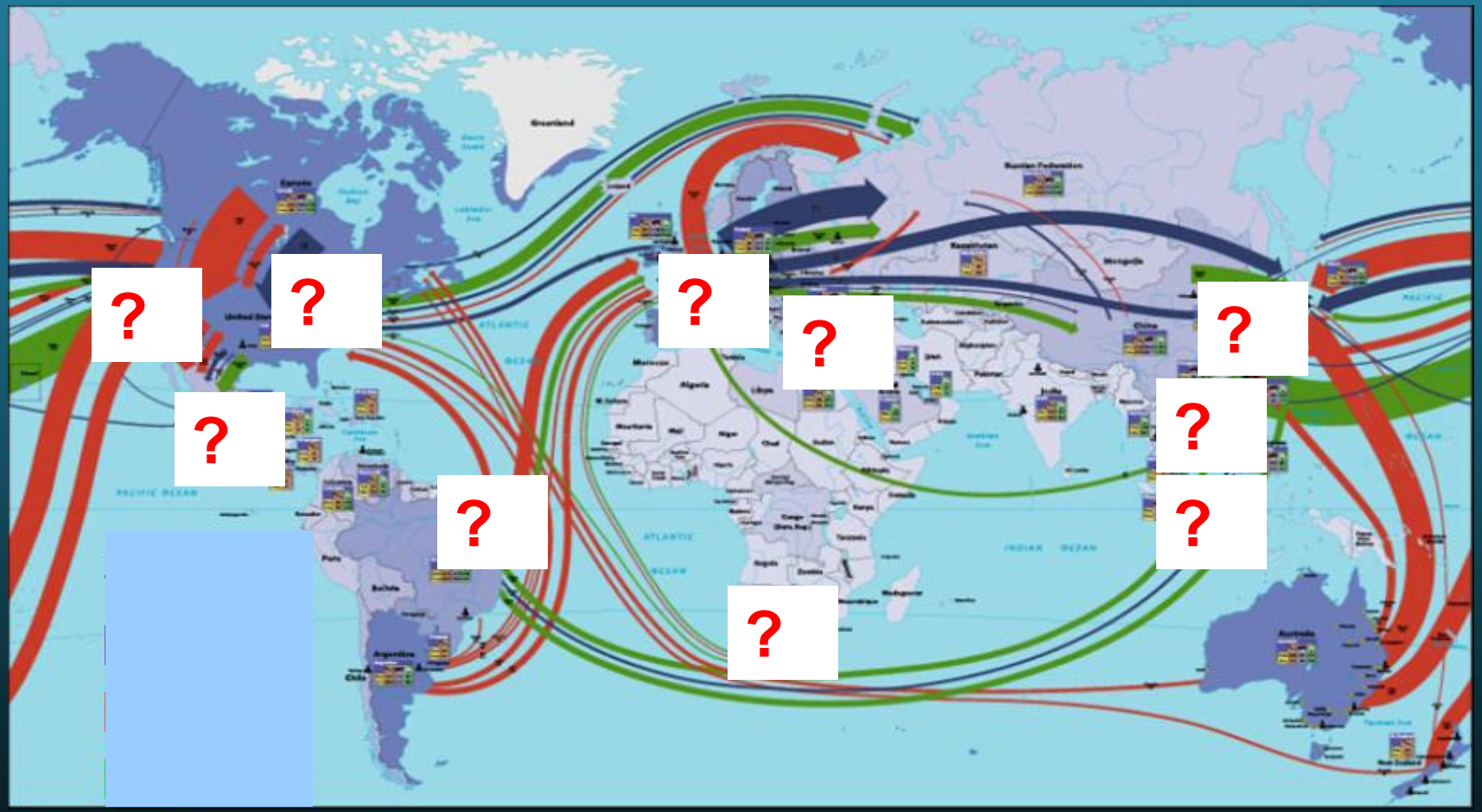
E. Bennett / WCS

E. Bennett / WCS

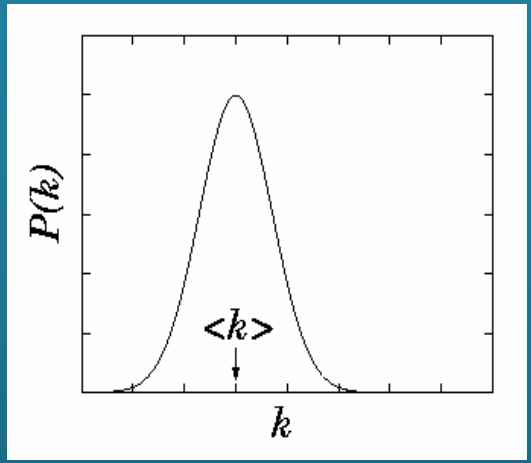
W. B. Karesh / WCS

C. Poole / WCS

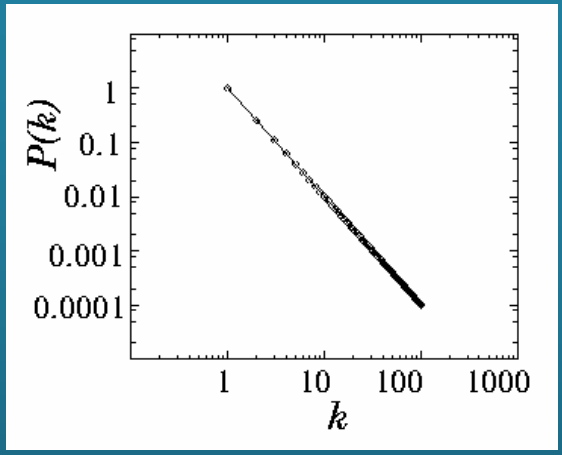
# The Global Wildlife Trade is Still Poorly Characterized

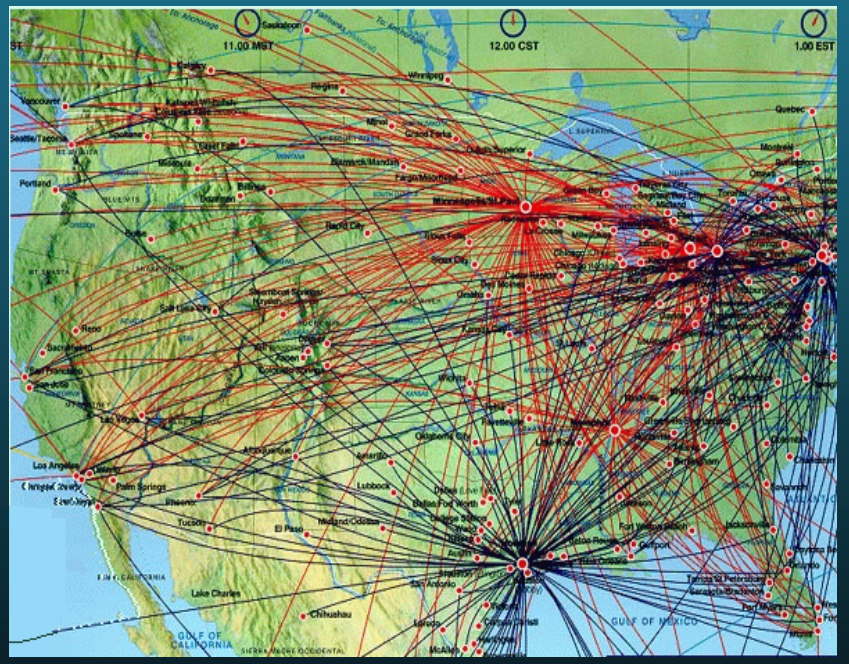


## Poisson distribution




## Power-law distribution






**Exponential Network**

**Scale-free Network**

WILDLIFE CONSERVATION SOCIETY

IUCN
The World Conservation Union

SPECIES SURVIVAL COMMISSION · VETERINARY SPECIALIST GROUP ·

Cargill™
嘉吉

中国科学院动物研究所 INSTITUTE OF ZOOLOGY CAS

TRAFFIC®
the wildlife trade monitoring network

bio-era

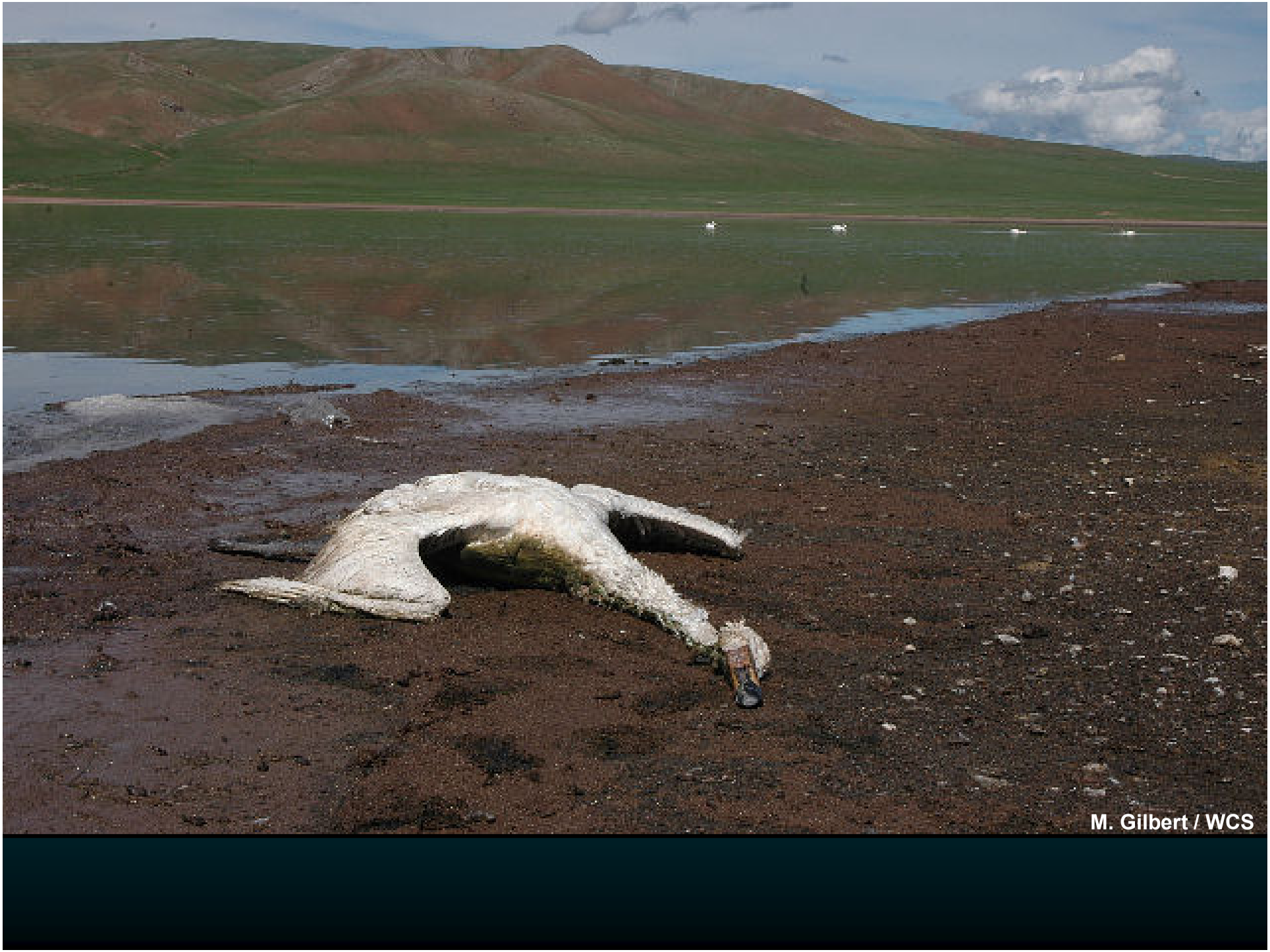
CDC
Department of Health and Human Services
Centers for Disease Control and Prevention

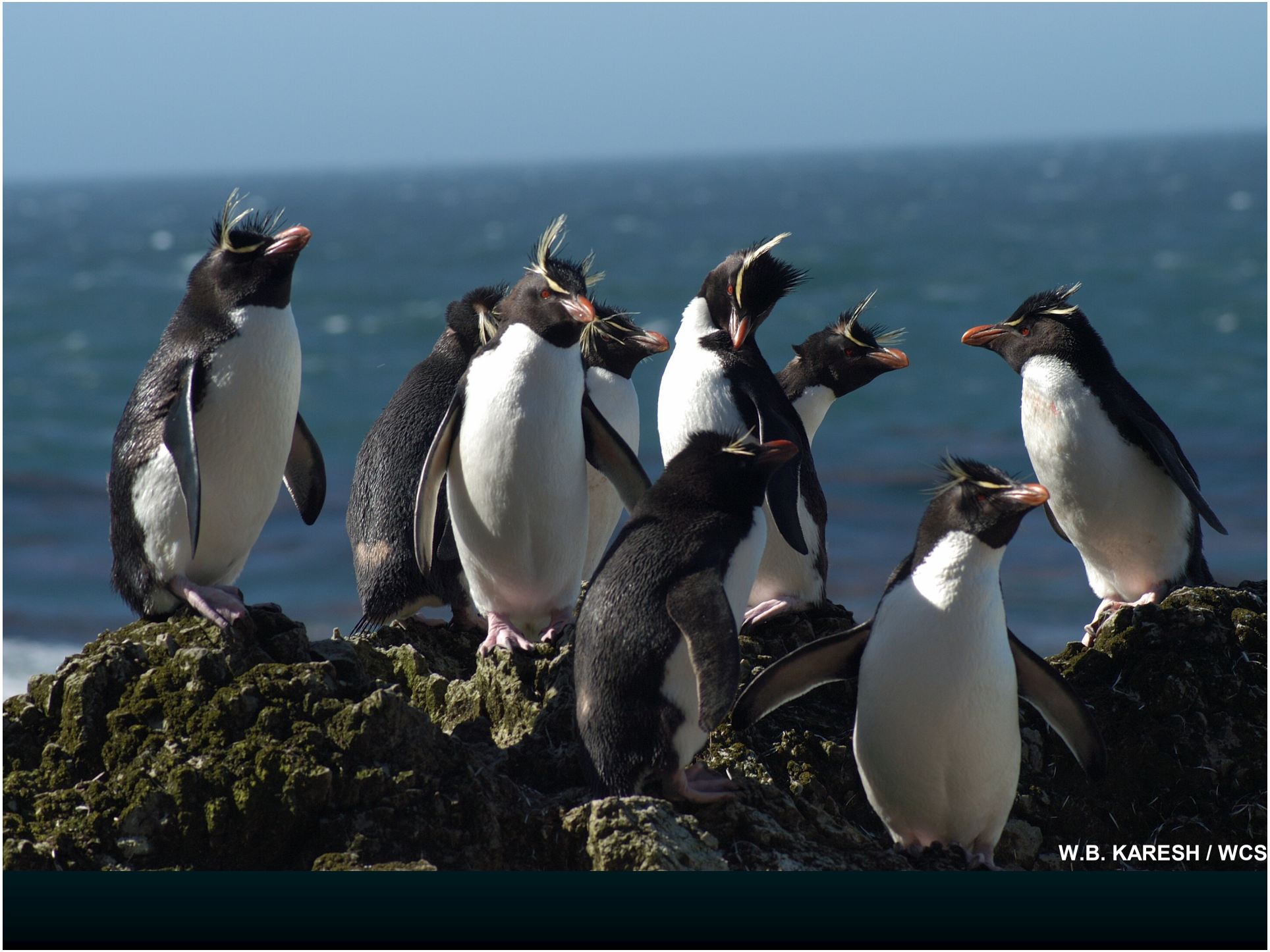
World Health Organization

FAO
FIAT PANIS

IDEXX
LABORATORIES

one world • one health


M. Gilbert / WCS


W.B. KARESH / WCS