



# POLAR BEARS AND HUMAN HEALTH

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# STUDIES ON WILDLIFE VS HUMANS

## Advantages

- Wildlife represents the food exposure to humans
- Easy access to samples from hunters
- Many species and larger populations to study
- Broader ranges in contaminant loads
- Limited interference with lifestyle changes
- Limited Ethical problems
- Historic collections may be more extensive
- Processes are closer to biological and physical processes

## Disadvantages

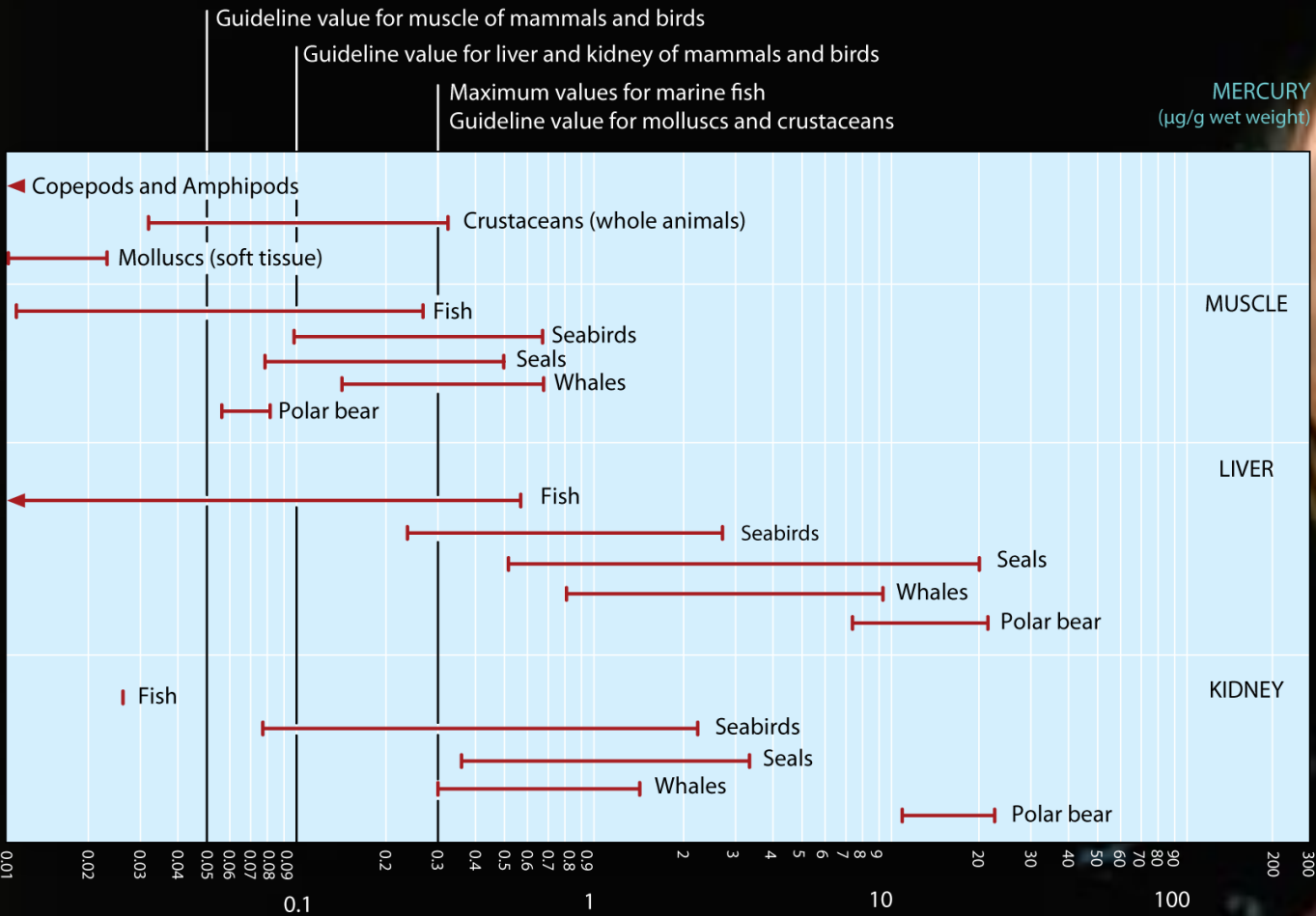
- Unknown history
- Uncertainties on age and exposure
- No public information registration files



# MAIN POLAR BEAR PROBLEMS?

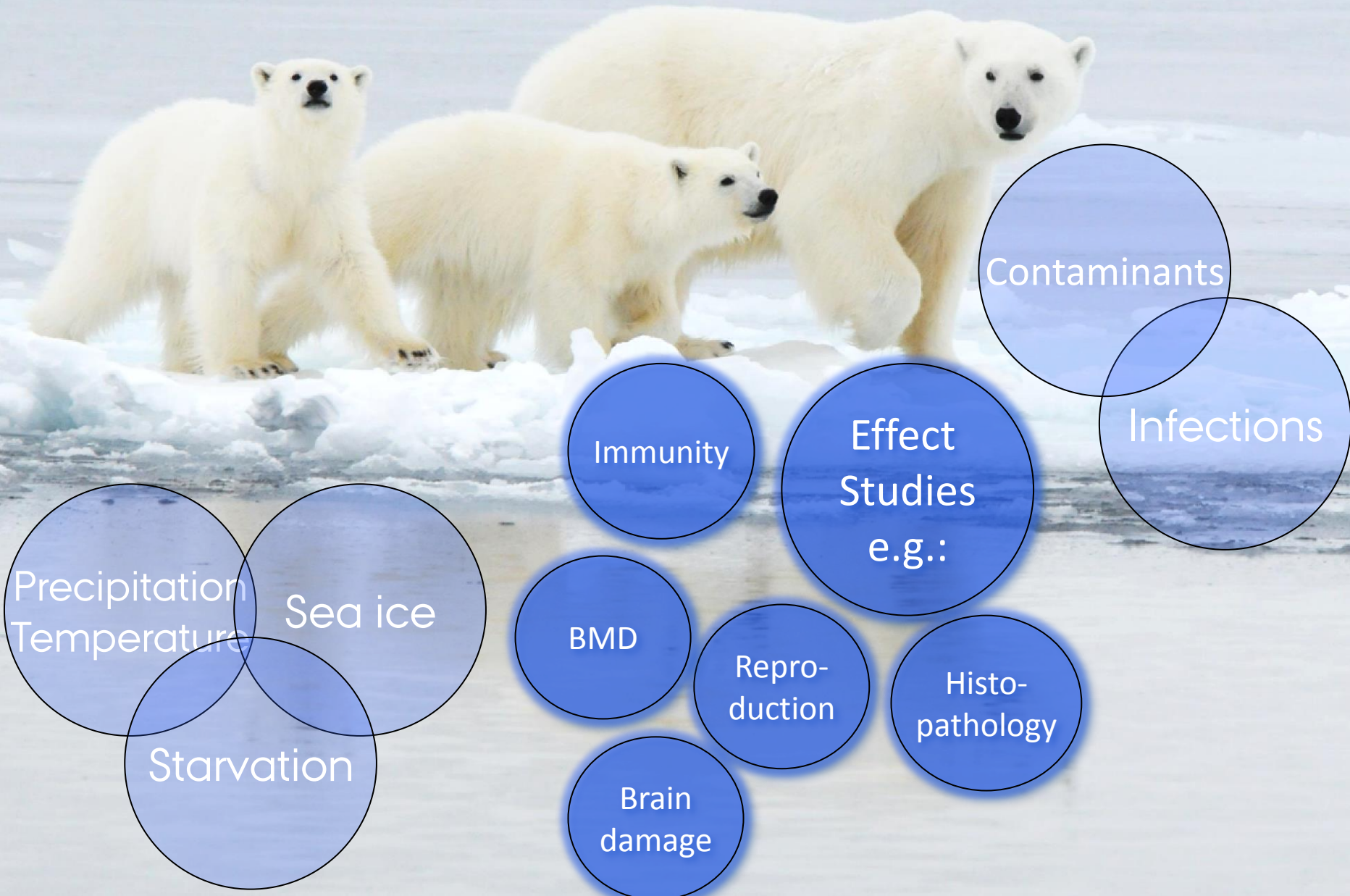


# INUIT CONSUMPTION AND FOOD GUIDELINES

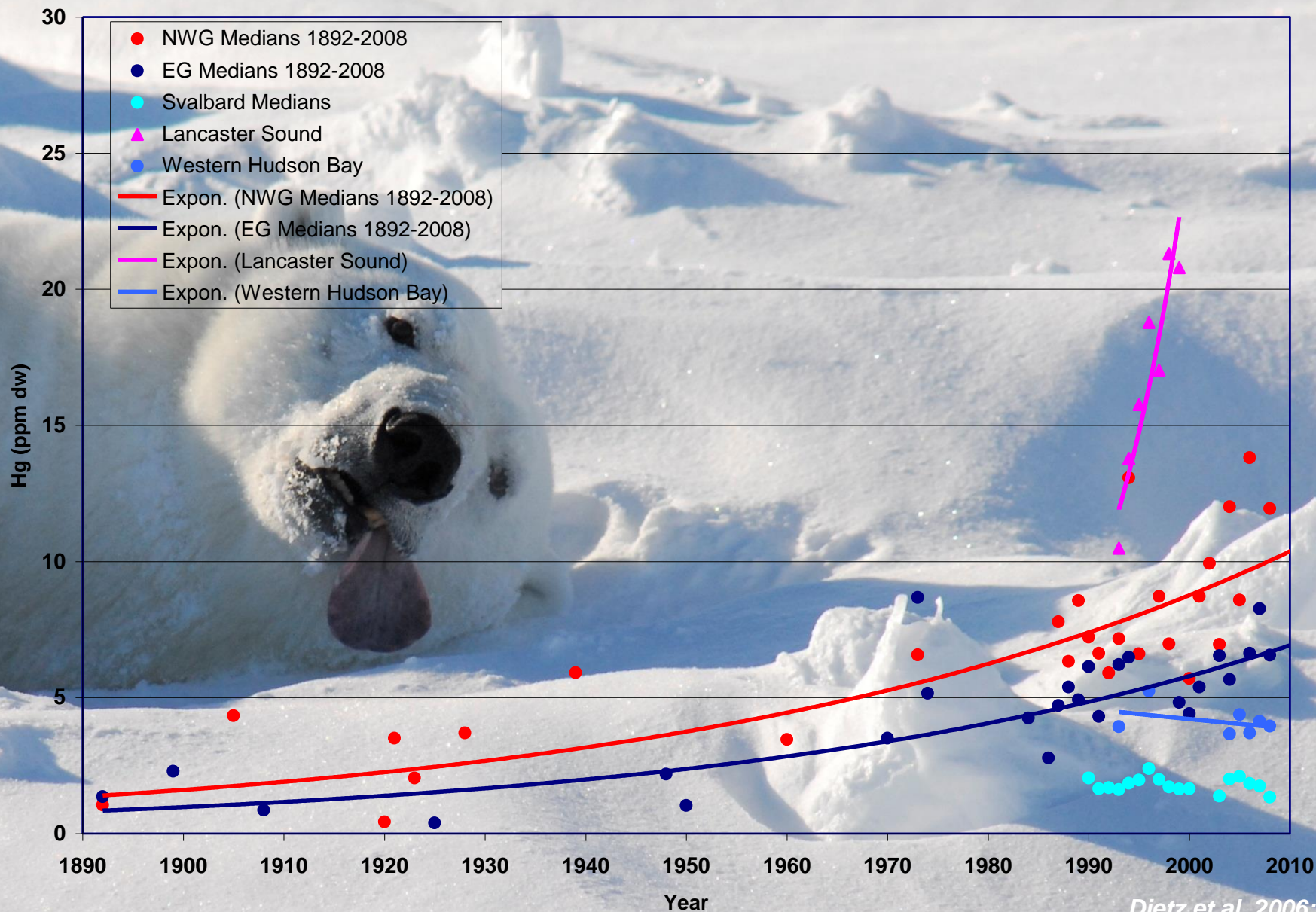


*Dietz et al. 1996; Dietz 2008*

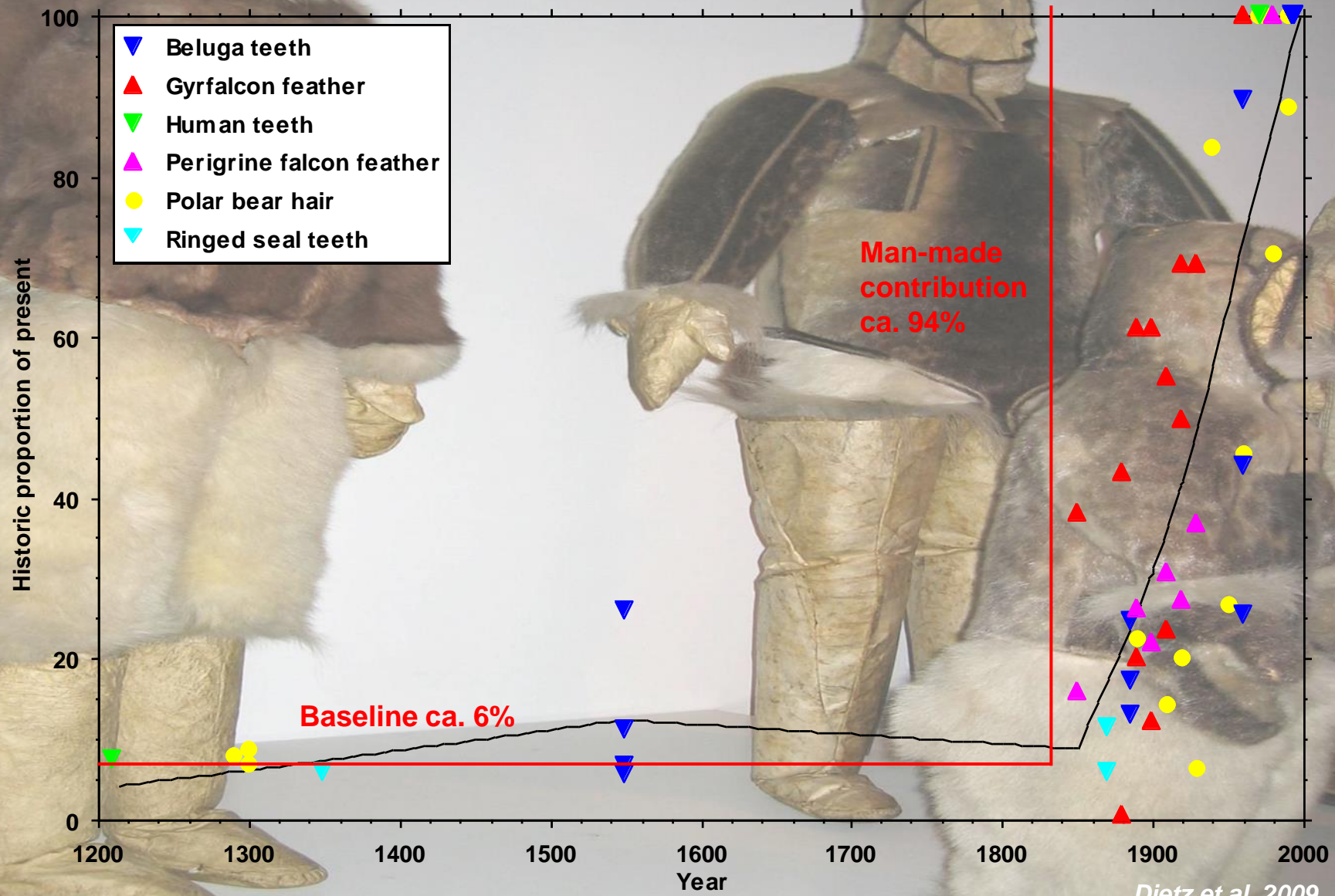
# POLAR BEARS AS WHISTLE BLOWERS



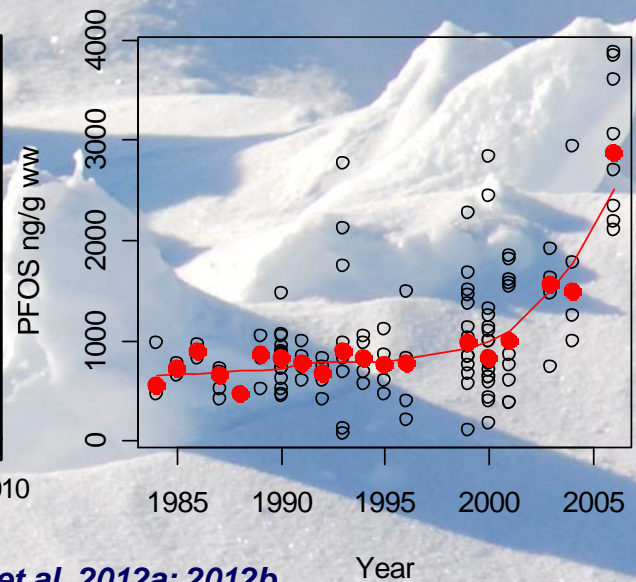
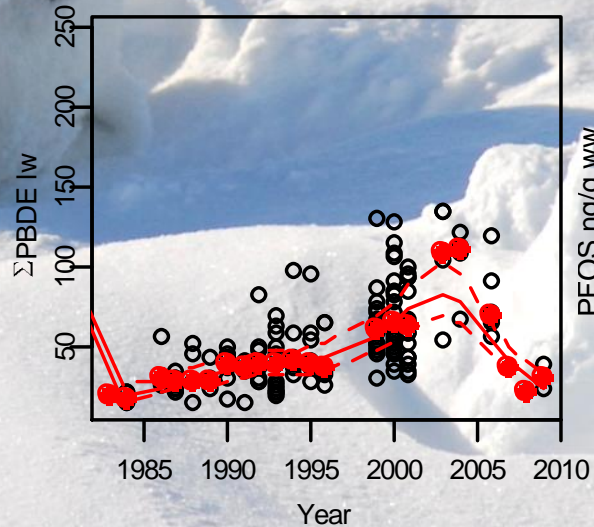
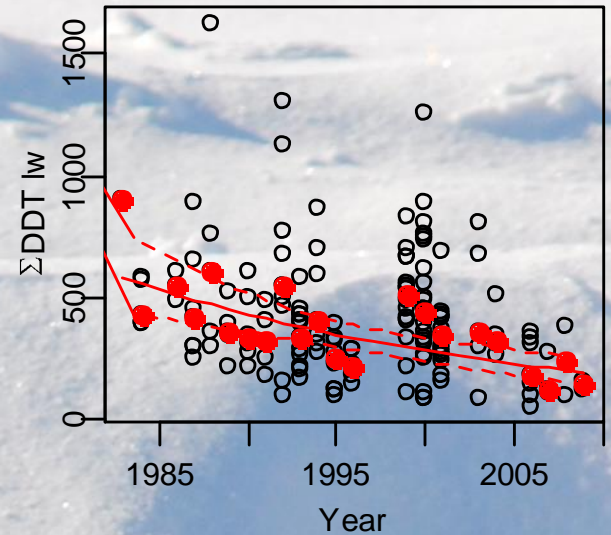
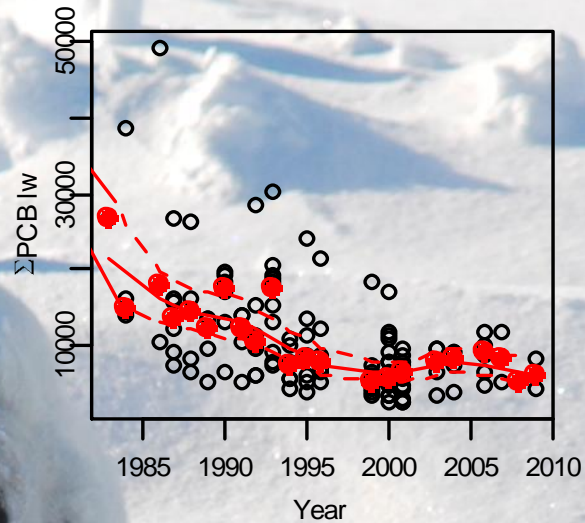
# HG TIME TRENDS IN POLAR BEAR HAIR



# HISTORIC HG TIME-SERIES IN ARCTIC WILDLIFE AND HUMANS



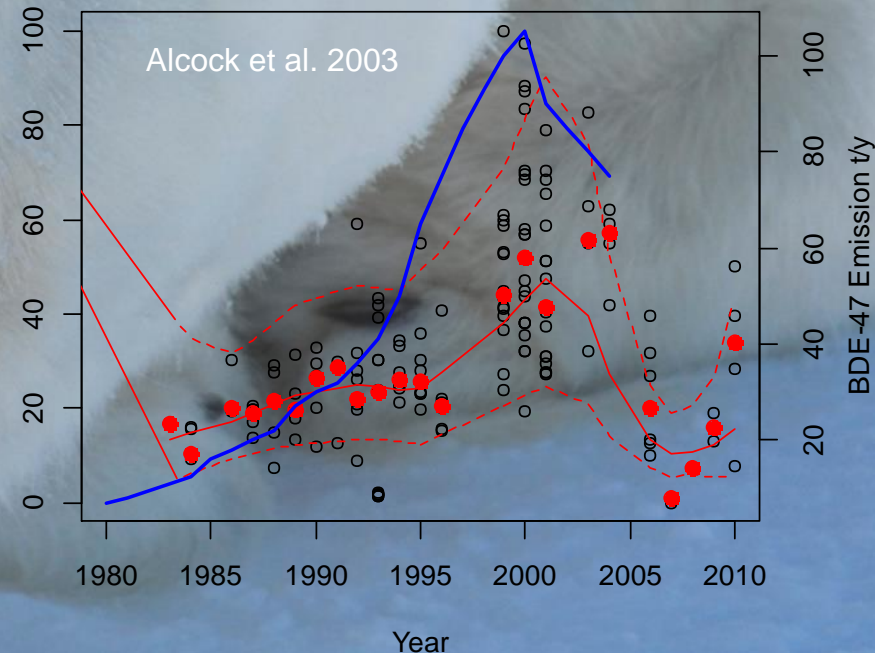
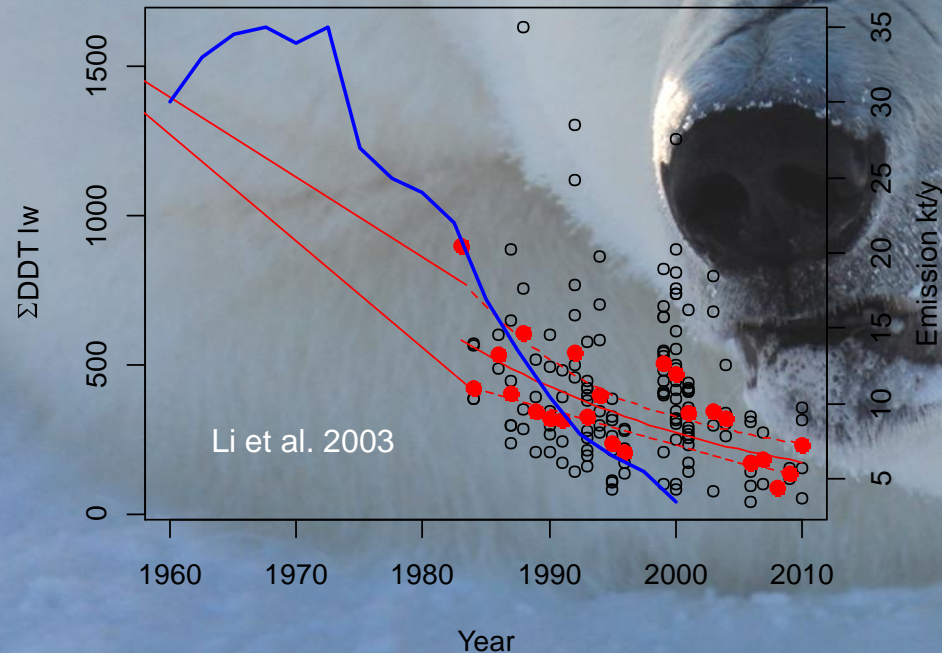
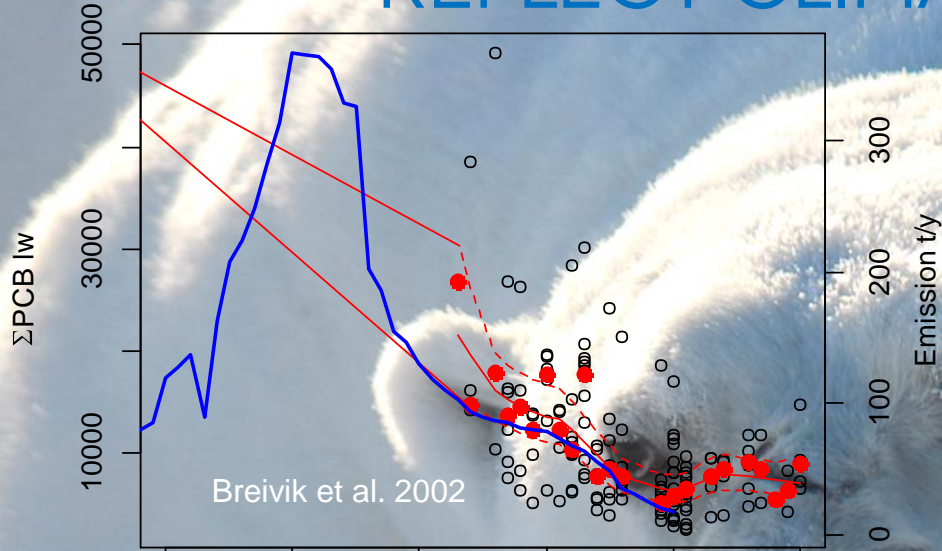
# POLAR BEARS PROVIDE SOME OF THE BEST UNBIASED TIME SERIES



*Dietz et al. 2012a; 2012b*

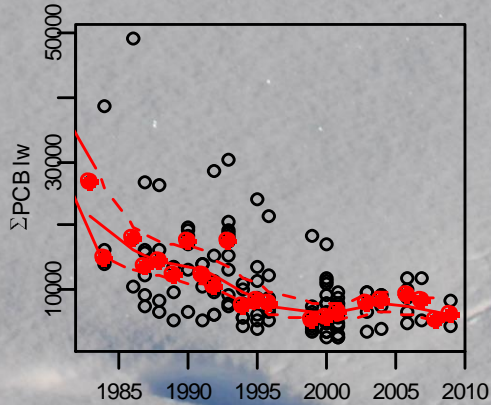


# DOES THE OBSERVED CONCENTRATIONS REFLECT CLIMATE TRENDS?

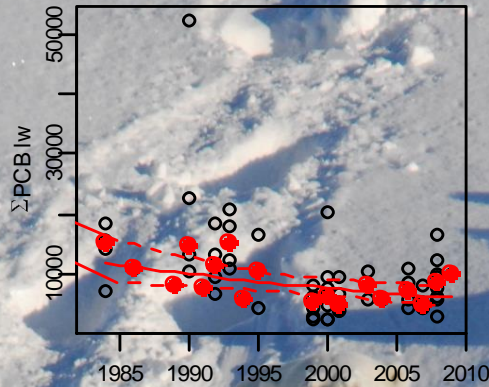


# ΣPCB, BF AND SI IN EAST GREENLAND POLAR BEARS

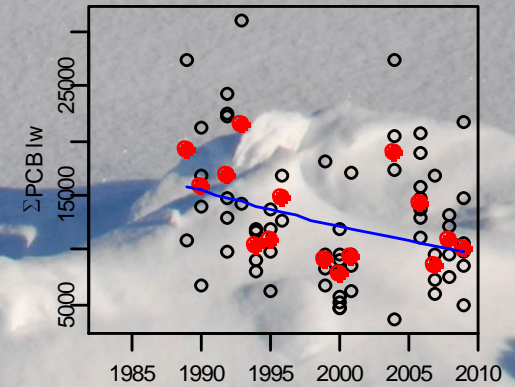
Polar bear, Juvenile, Ittoqqortoormiit



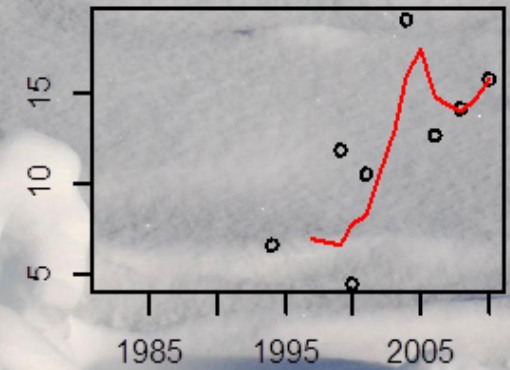
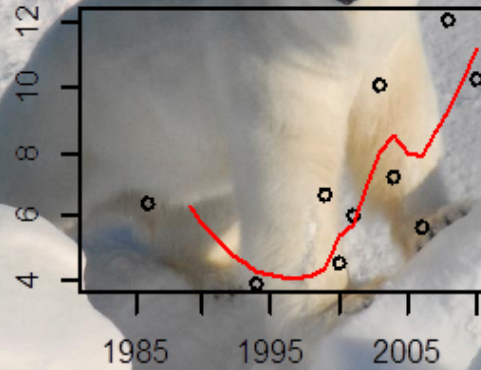
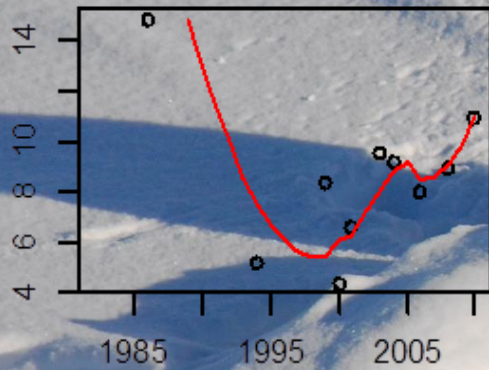
Polar bear, Adult female, Ittoqqortoormiit



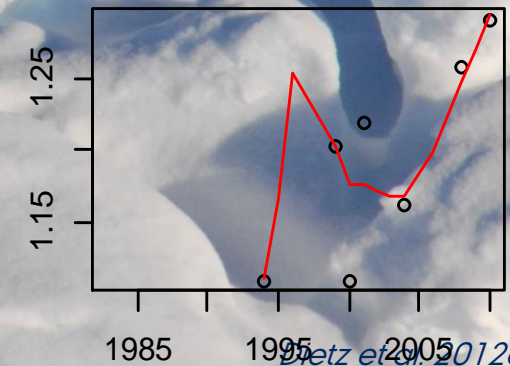
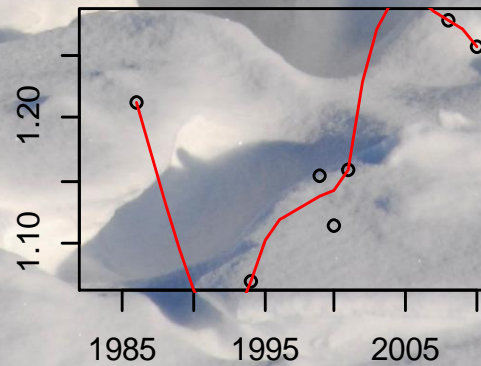
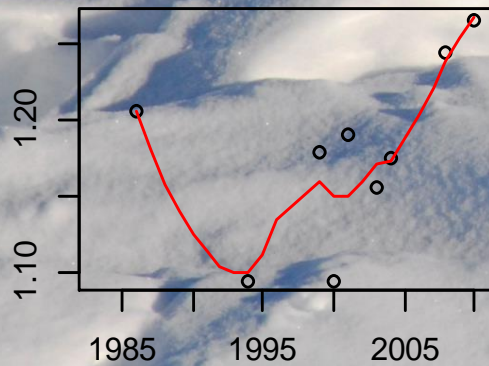
Polar bear, Adult male, Ittoqqortoormiit



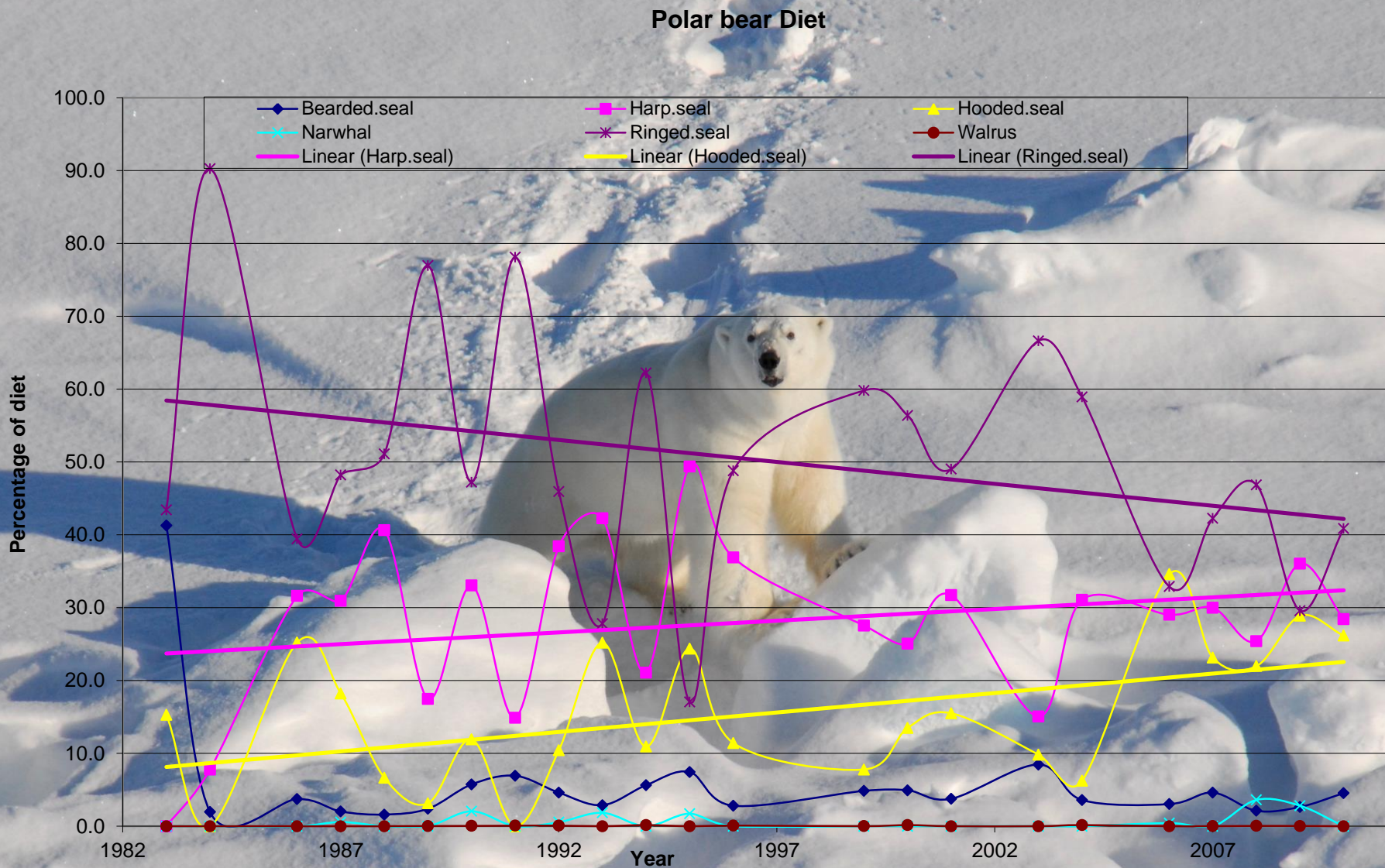
Biomagnification factor PB/RS



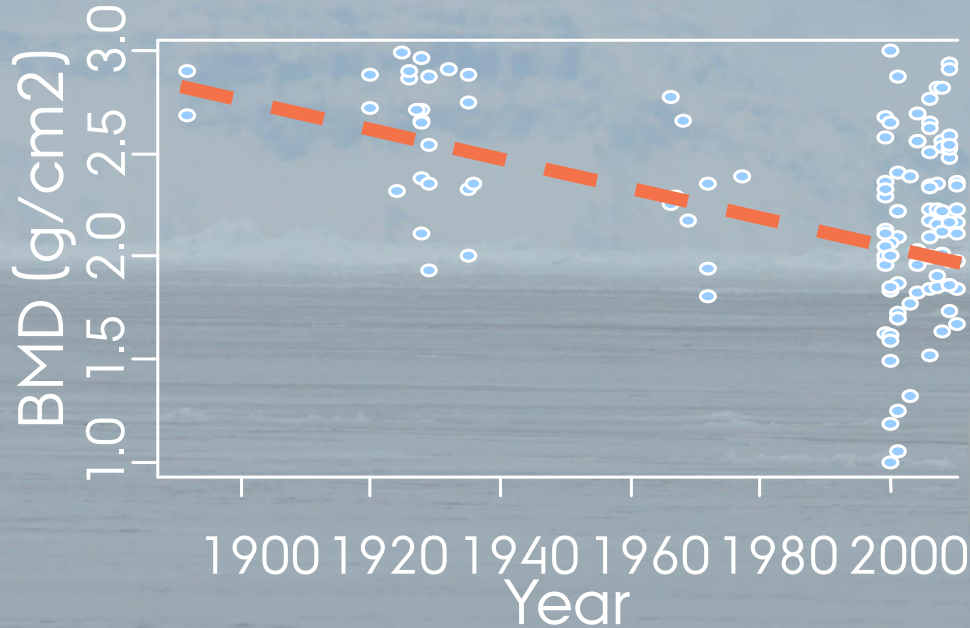
SI (N15) ratio PB/RS



# POLAR BEAR FOOD VARIATION OVER TIME

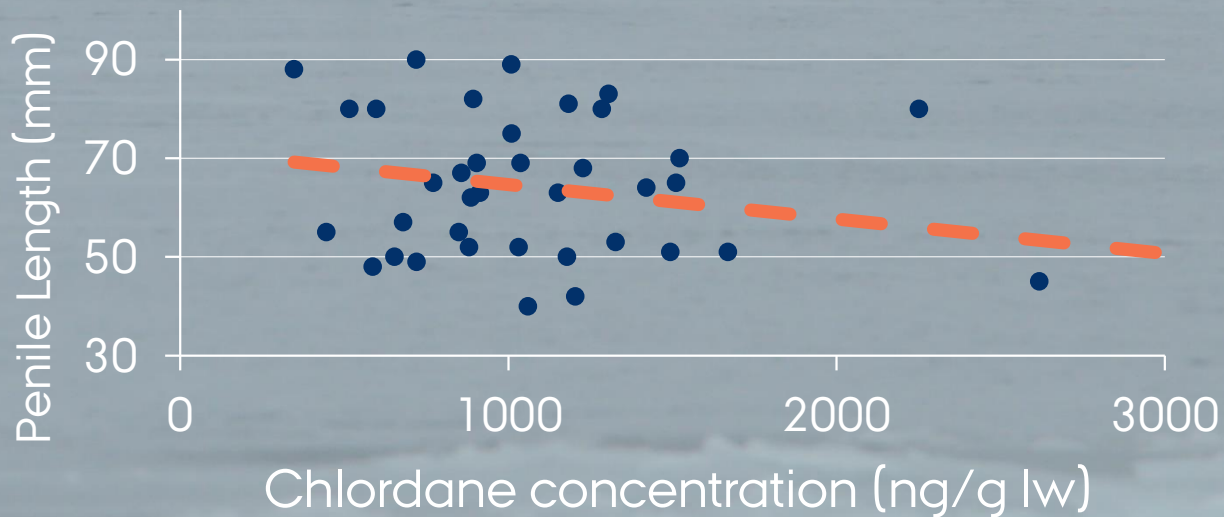


# WHISTLE BLOWING: EFFECTS



OSTEOPOROSIS?

REDUCED SIZE OF  
SEXUAL ORGANS?

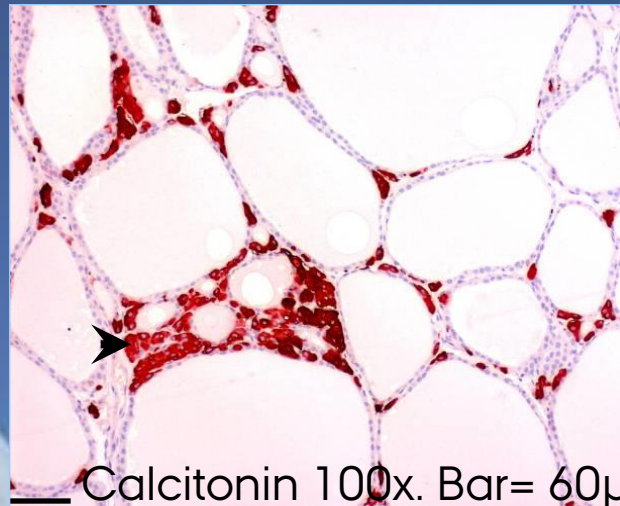


# WHISTLE BLOWING: EFFECTS

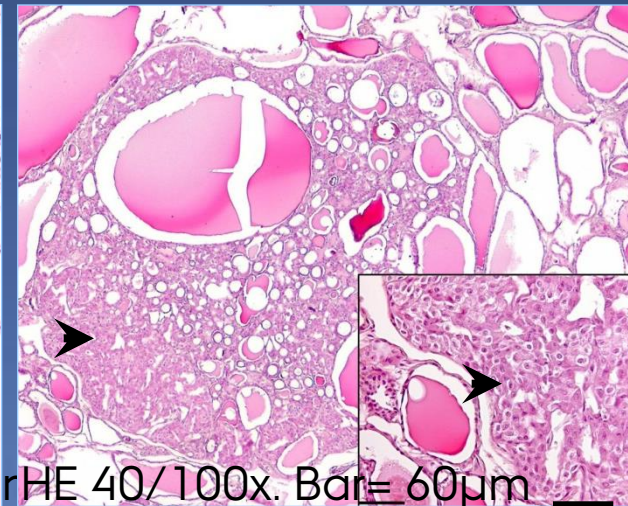
C-cell proliferation



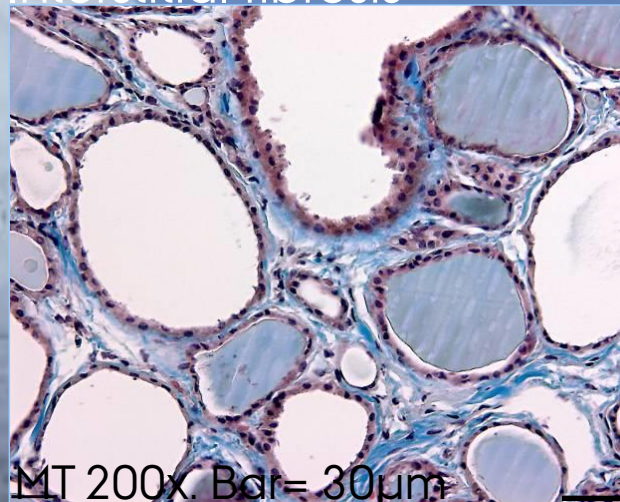
Calcitonin



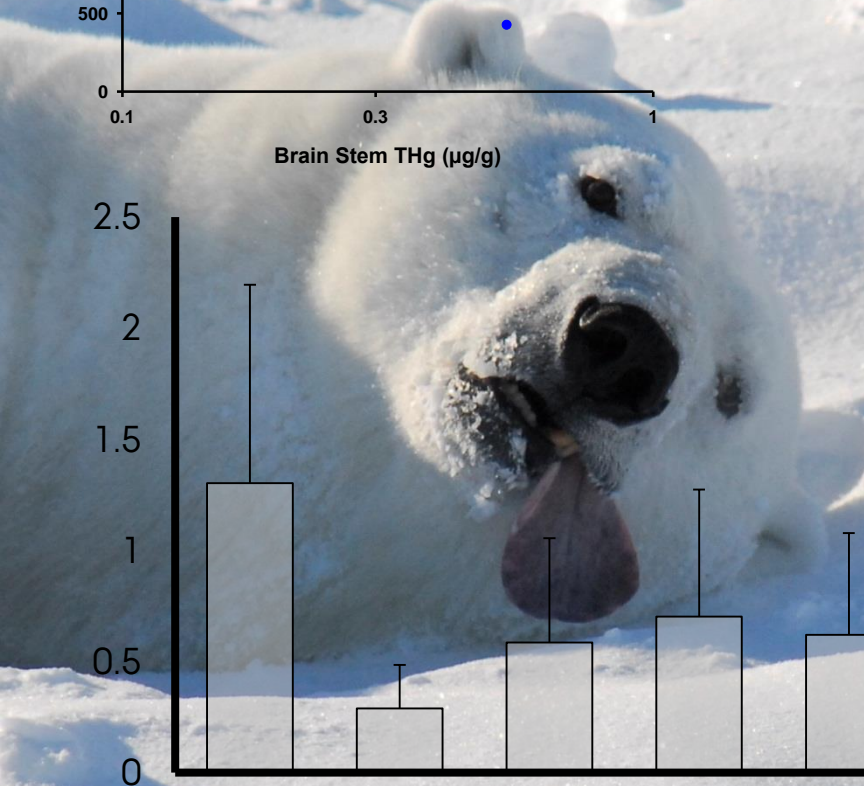
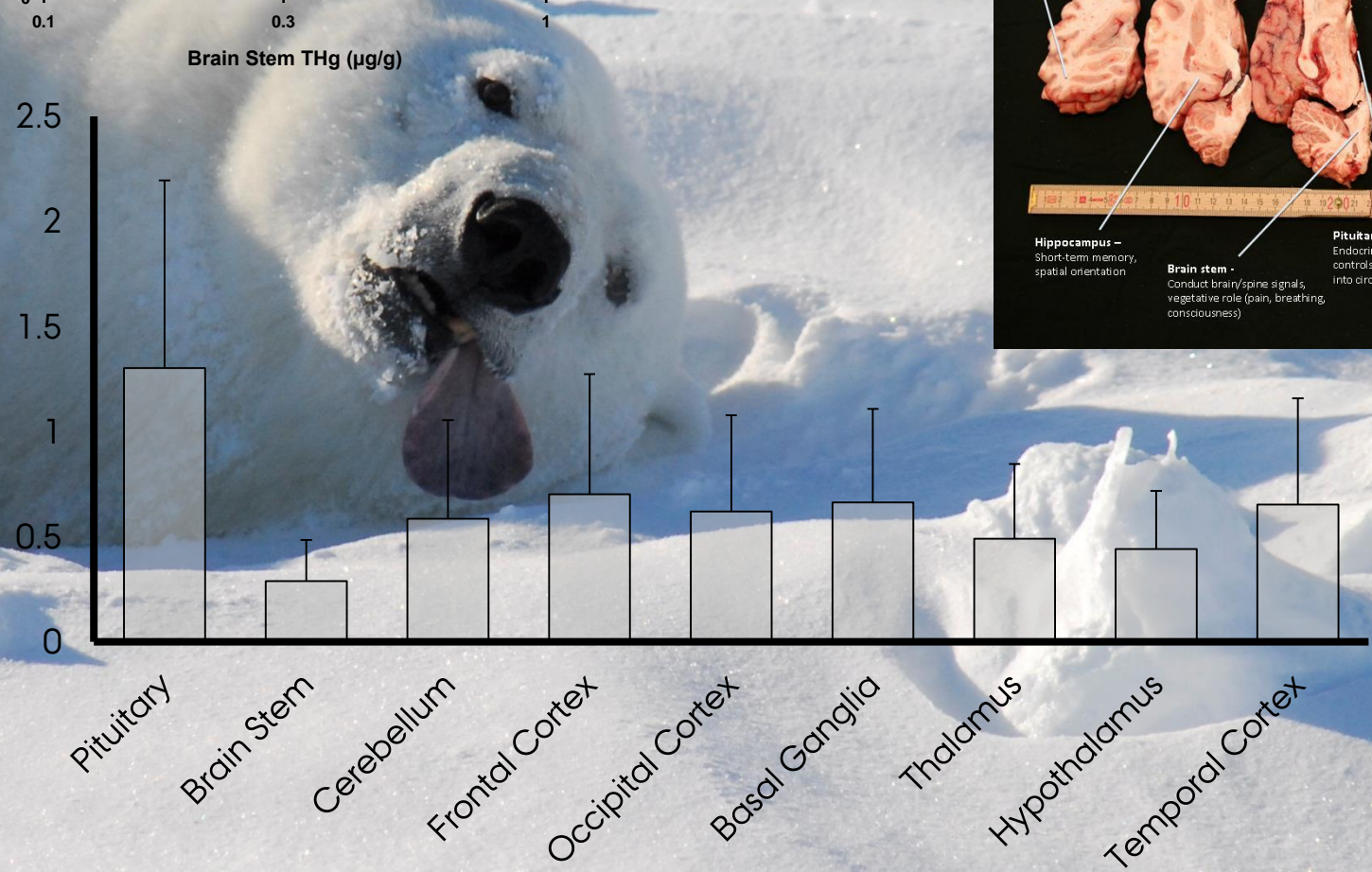
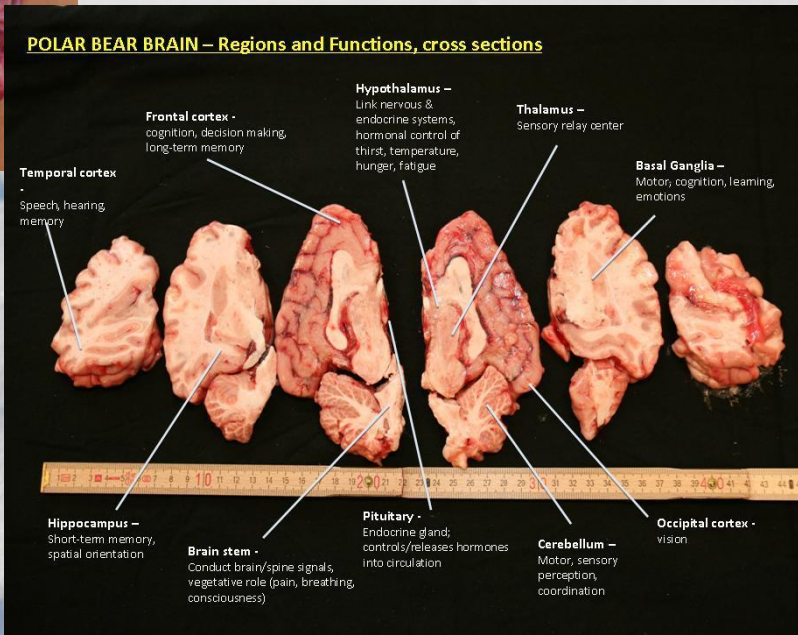
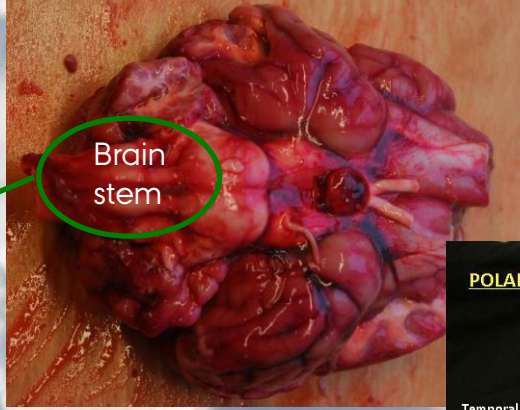
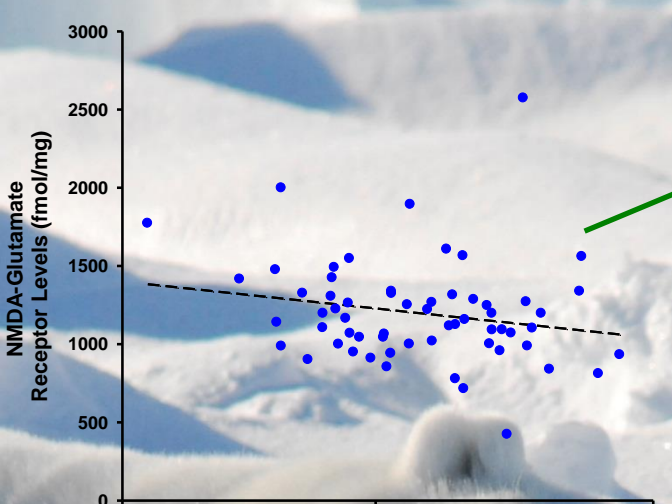
Nodular hyperplasia



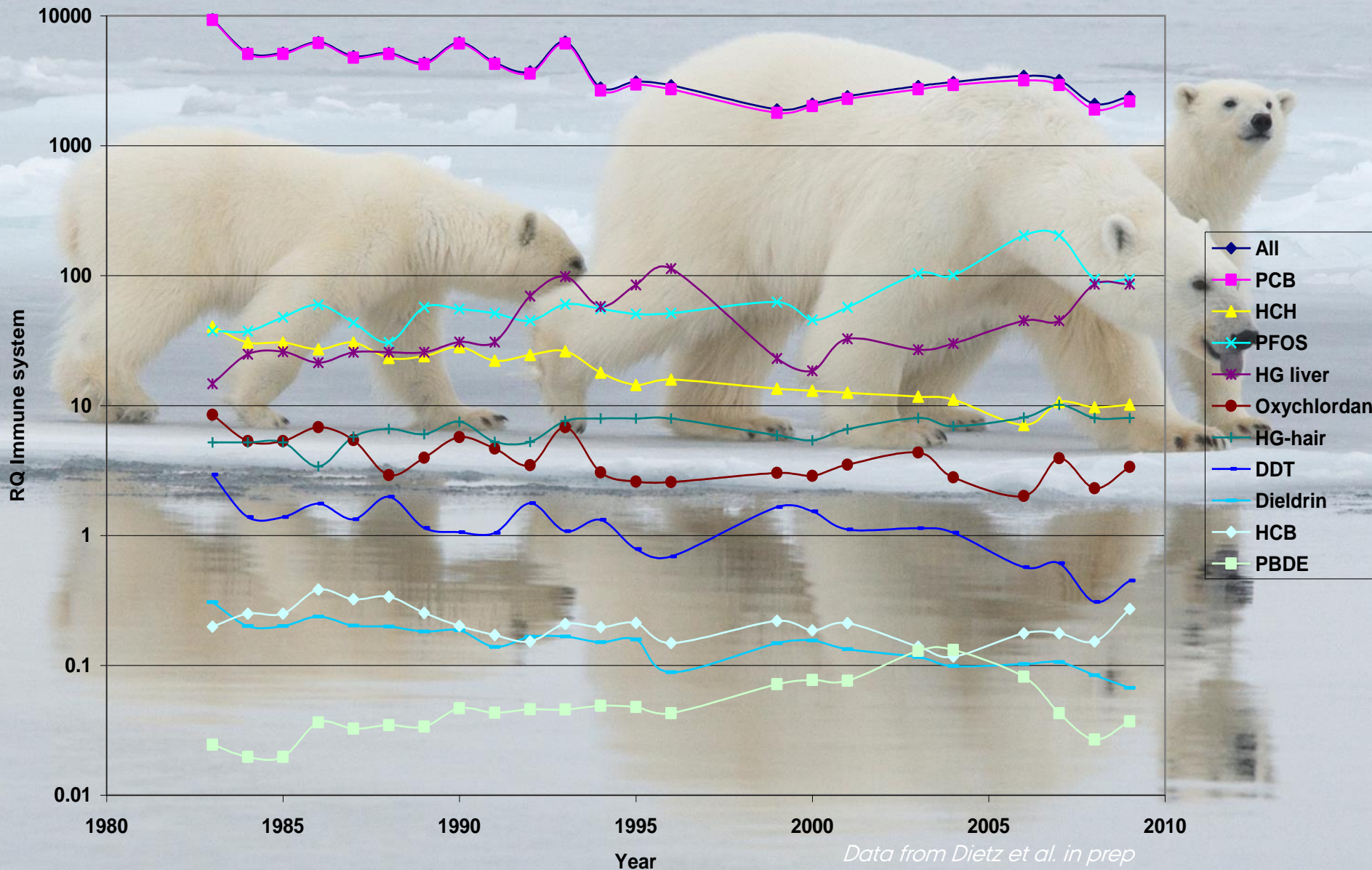
Interstitial fibrosis



# ETHICS IN SCIENCE

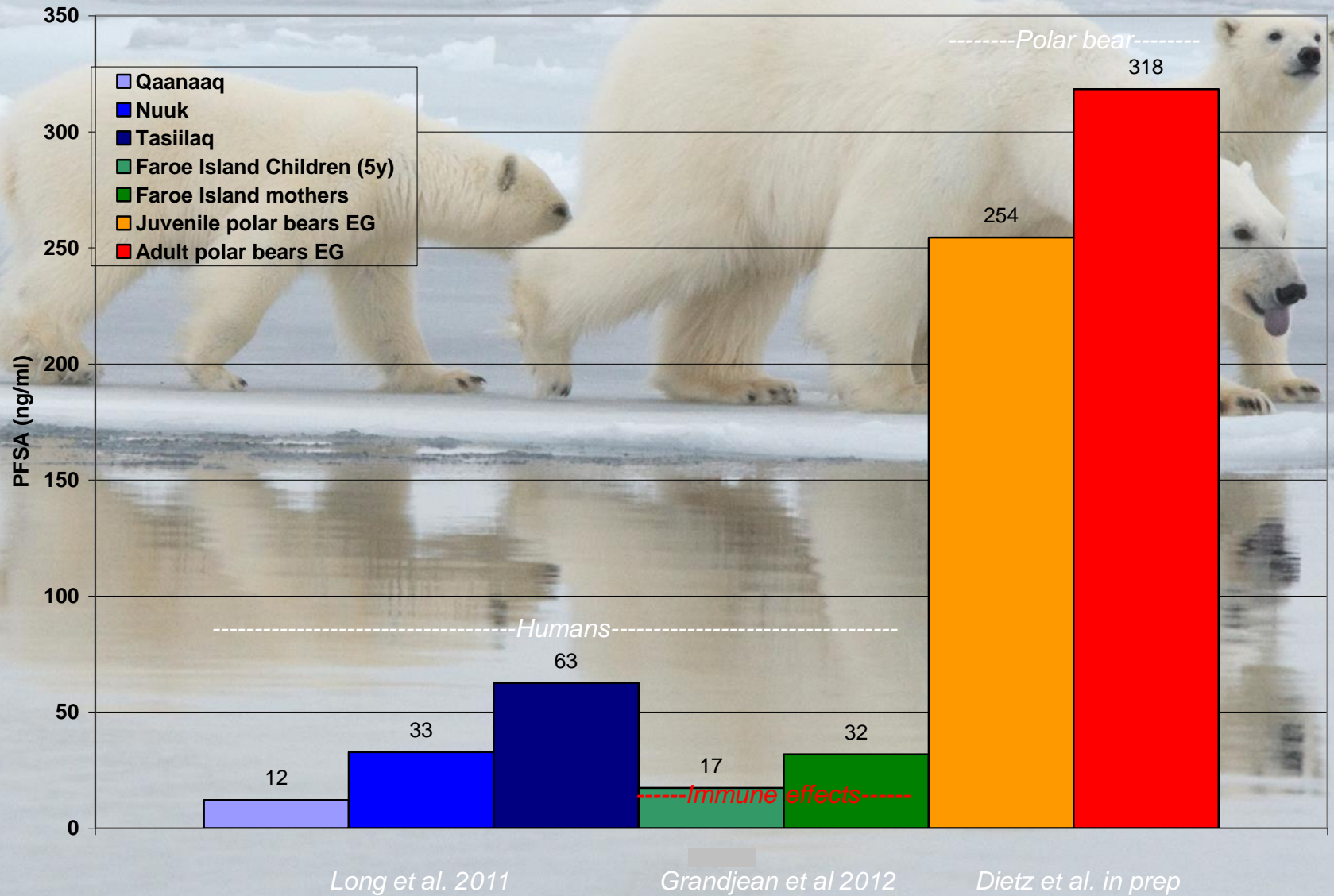


# RISK QUOTIENTS FOR EFFECT ON THE IMMUNE SYSTEM IN JUVENILE EAST GREENLAND POLAR BEARS



Risk Quotients (RQ=BR/CBR) based on conservative data for critical oral dose of rats

# PERSPECTIVES IN COMBINING DATA FROM HUMANS AND WILDLIFE





# DOSE RESPONSE ASSAYS ON LYMPHOCYTES

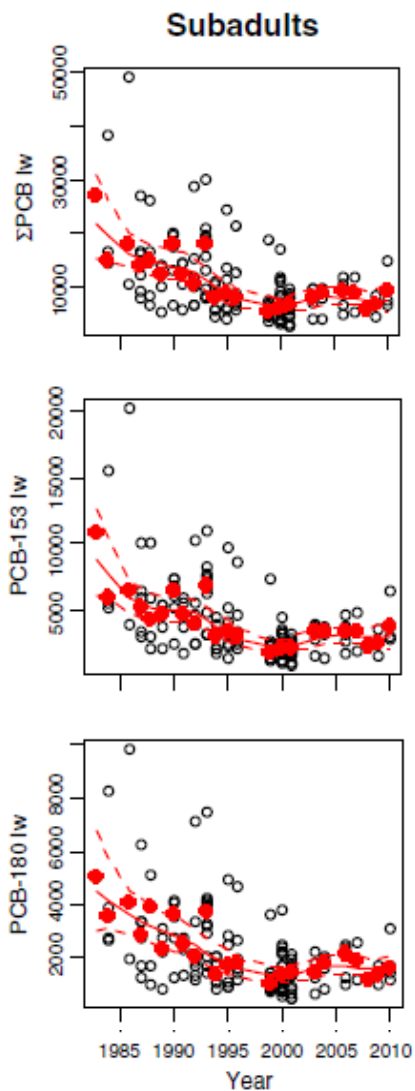
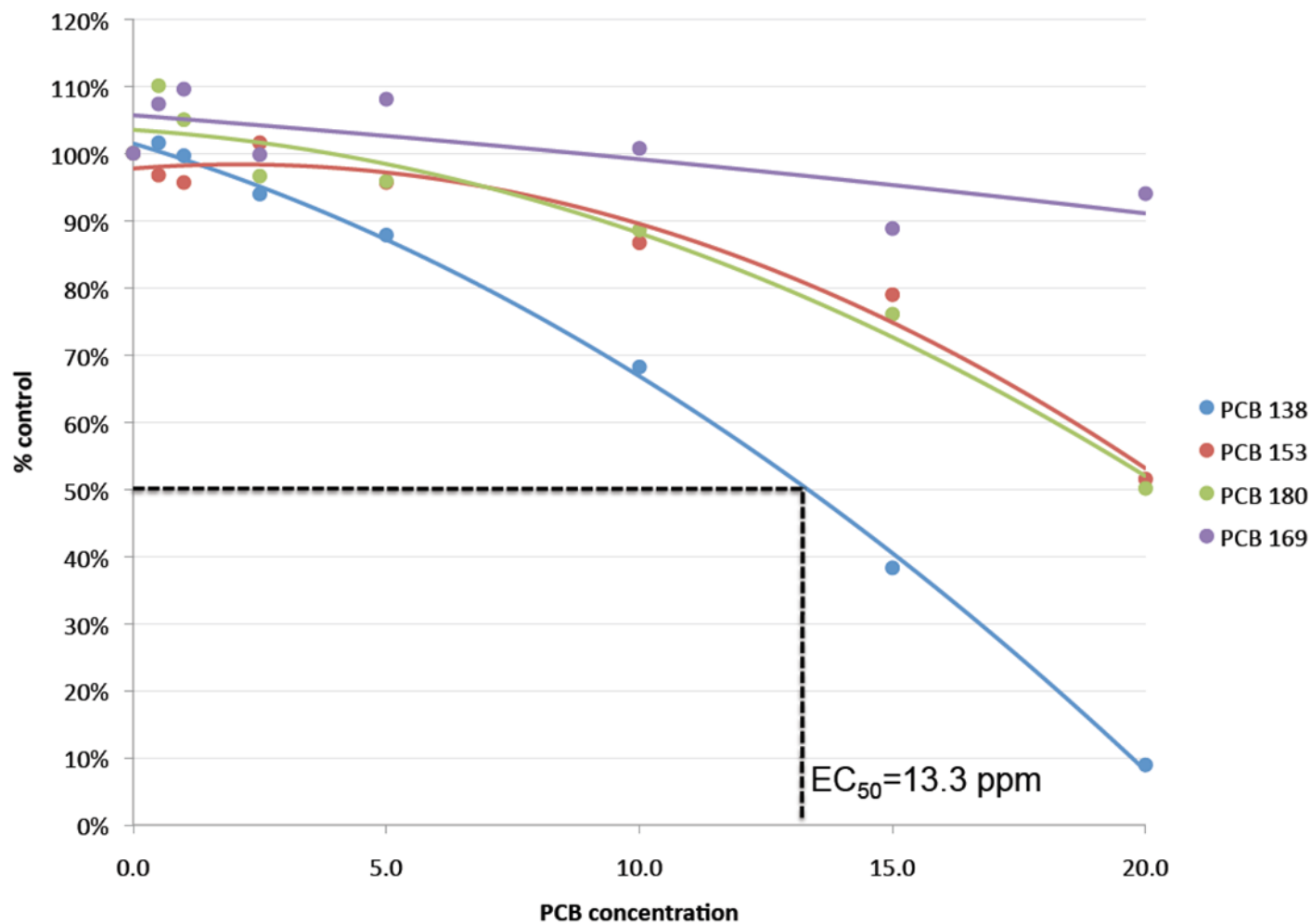
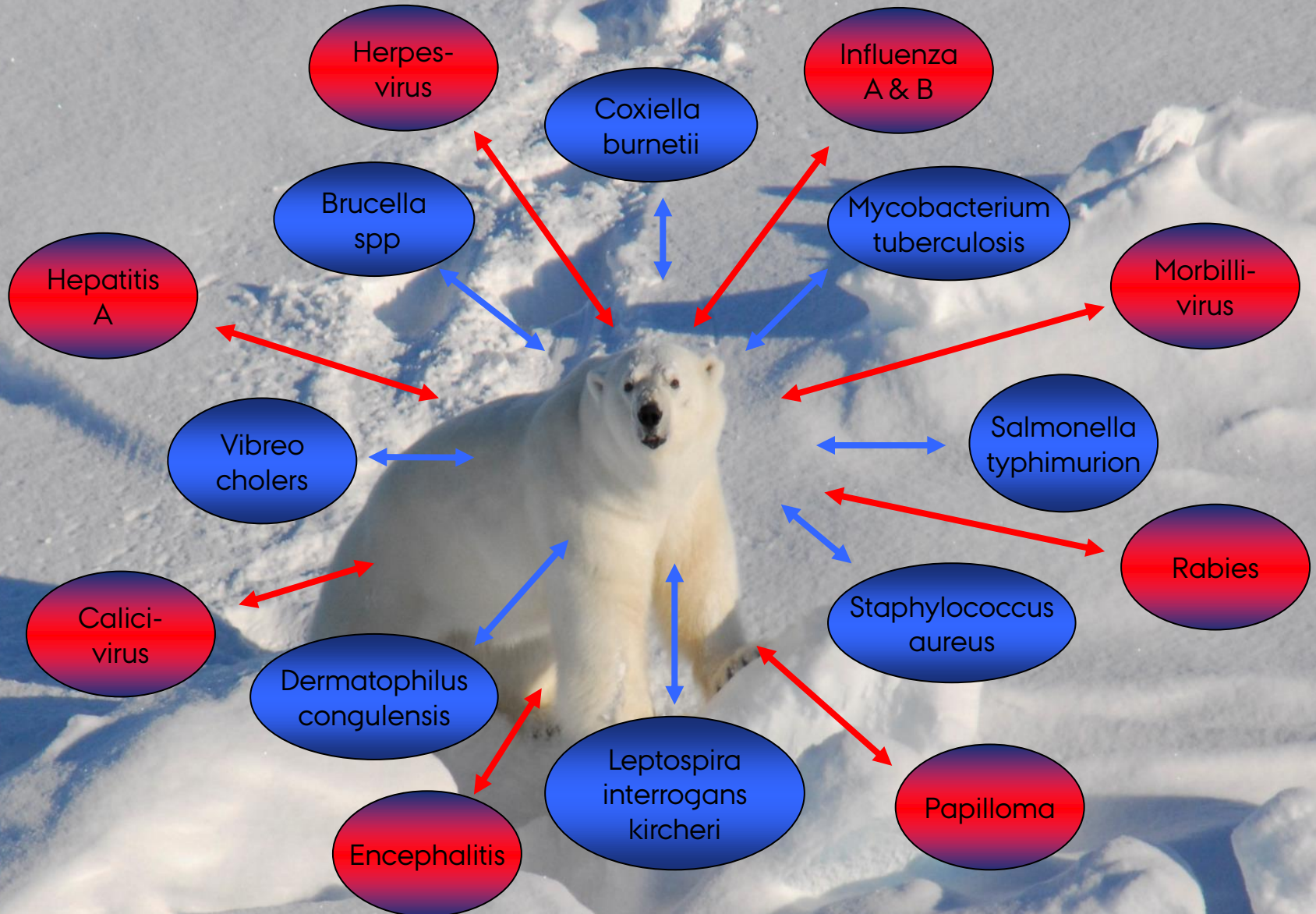


Figure 10

### T lymphocyte proliferation Concentration Response Curves



# PERSPECTIVES IN COMBINING DATA FROM HUMANS AND WILDLIFE



# CHALLENGES IN COMBINING DATA FROM HUMANS AND WILDLIFE

## HH AND WILDLIFE AMAP EFFECT ASSESSMENT:

- Comparative effect assessment
- Pharmacokinetic modelling
- Dose response approach on immunosuppression
- Zoonotic diseases

- Endocrine system
- Cardio-vascular diseases
- Diabetes
- Cancer
- Osteoporosis
- Other diseases