

WHAT IS ULTRA-VIOLET RADIATION?

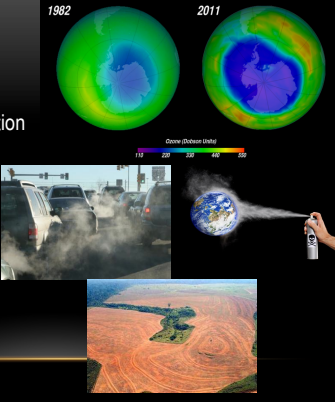
• Electromagnetic radiation emissions
• Beyond Violet – 3 different types
• UVA 100 – 280 nm Wavelength
• UVB 280 – 315 nm Wavelength
• UVC 315 - 400 nm Wavelength

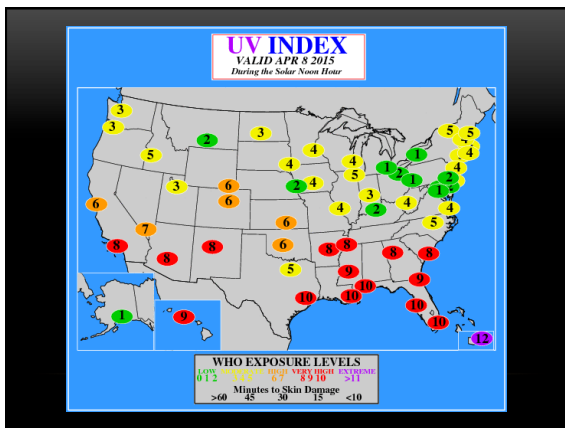
UV-B RADIATION

- $\approx 7\%$ of UV-B reaches the earth's surface (Madronich et al. 1998)
- Amounts are variable
 - Latitude
 - Elevation
 - Time of day
- 1000x more damaging than UV-A radiation (Difley 1991)

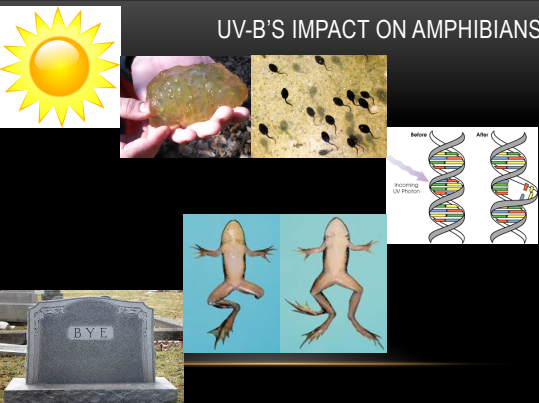
CAUSES (MONTZKA AND REIMANN 2010)

- Constant presence
- Increasing ozone depletion
 - Deforestation
 - Chlorofluorocarbons
 - Aerosols
 - Refrigerants
 - Air Pollution





UV-B'S IMPACT ON AMPHIBIANS




UV-B'S IMPACT

- Decreased hatching success (Fitz et al. 1998)
- Increased Abnormalities
- Delayed development (Belden et al. 2000)
- Delayed metamorphosis
- Smaller overall size
- Enhances effect of other factors (Blaustein et al. 1998)
 - pH
 - Contaminants
 - Pathogens
- Damage to DNA (Blaustein and Belden 2003)


UV-B'S IMPACT

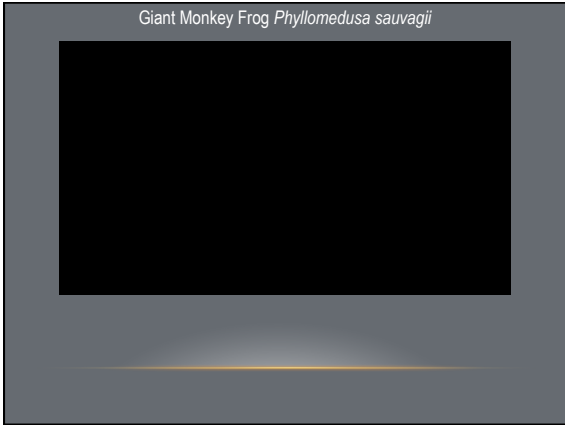
- Effects all stages of amphibian life cycle (Blaustein 2003)
- Eggs
 - No shell
 - Shallow depth
- Larvae
 - Shallow Depth
 - Retinal Damage
- Adults
 - Skin Damage
 - Retinal Damage
- DNA throughout all life stages (Blaustein and Belden 2003)
 - Forms cyclobutane pyrimidine dimers
 - Inhibit proper translation and transcription



NORTHERN LEOPARD FROG (RANA PIPIENS)

- Experiment by Atchley et al. 2002
- UV Exposure 100 – 85 – 75 – 65 – 50 – 25%
- Glass or acrylamide to filter the UVB
- 100% exposure caused 50% Mortality rate of frogs during larval development
- 63.5% exposure caused 50% limb malformation rate
- 97% individuals were affected by unaltered sunlight
- 0% affected by 25% sunlight treatments





FINAL THOUGHTS

- Amphibians are attempting to combat UV-B rays
 - Perch height
 - Egg placement
 - Swimming Depths
- UV-B rays are ever present
- Until all frogs acquire sunscreen UV-B Radiation will continue harm and kill amphibians

REFERENCES

Photos

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Data

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