



CONS 127

Observing the Earth From Space

Bit about me

Chris Colton, MSc.

Lecturer

Faculty of Forestry

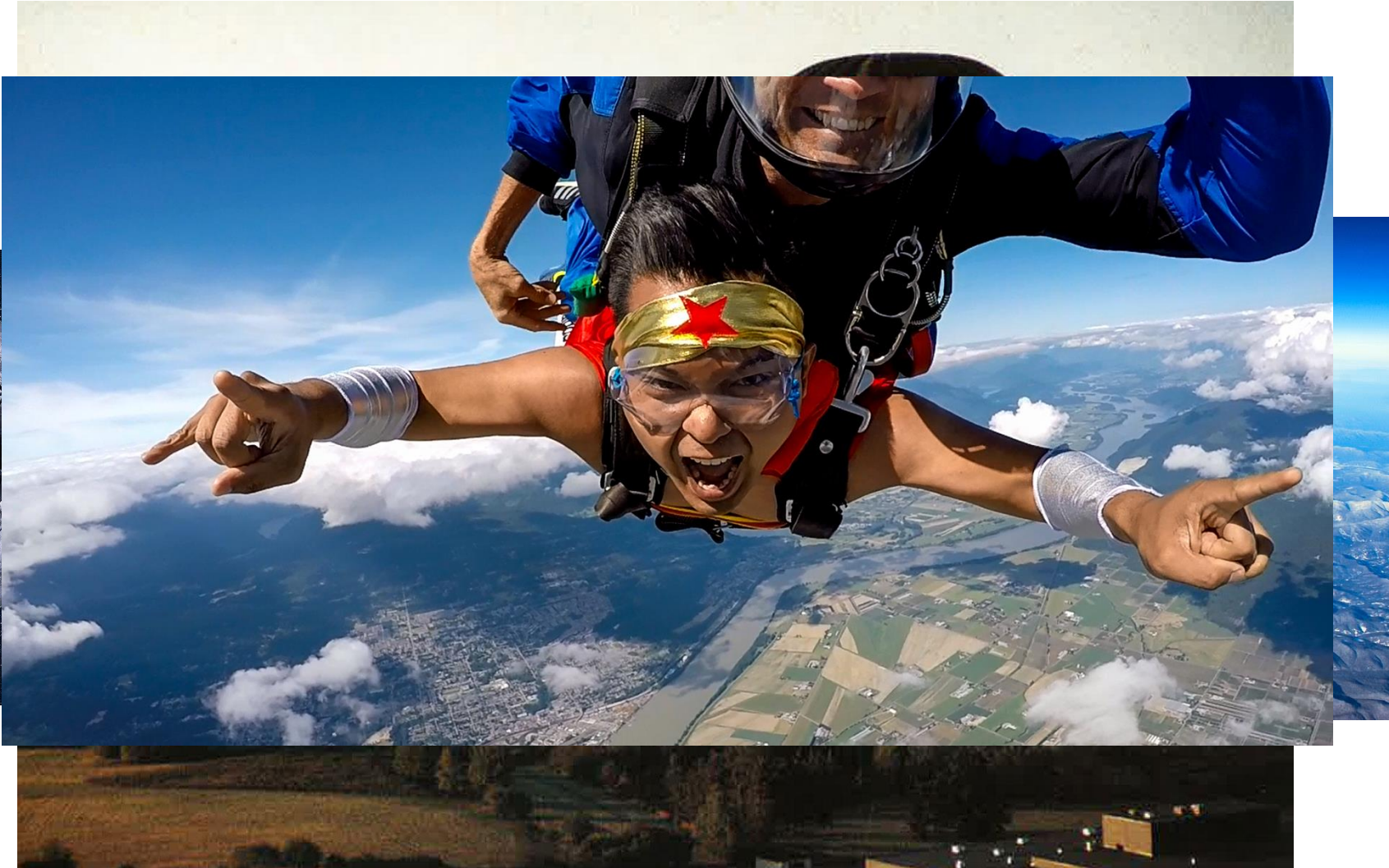
chris.colton@ubc.ca

Room 2229, Forest Science
Centre

2424 Main Mall



What do you think when you hear the term



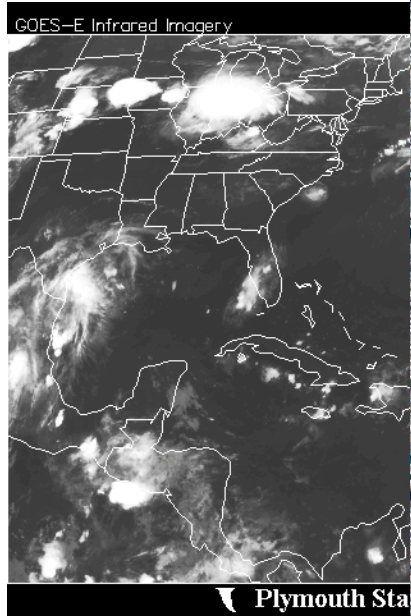
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Earth Observation ?



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Learning Objectives

Completing this course you will be able to:

- Describe how Earth Observation technologies can be used to understand how the Earth Environment and climate is changing.
- Understand the basis of geo-positioning technologies such as GPS and location services.
- Understand how light interacts with Earth surface materials allowing us to sense colour, and surface attributes.
- Explain the role of emerging technologies, like remote sensing, geotagging, and web-based technologies, such as Google Earth, for natural resource management applications.
- Synthesize and critique the impact location-based services, global positioning systems, remote sensing, virtual globes and web based mapping on how we perceive the Earth's environment.
- Demonstrate basic knowledge of the various geospatial technologies and how we use them, alone or together for the management of our natural resources.



Where am I?

- How do I know where I am on the Earth?
- How is the Earth portrayed in maps and from satellites?
- How do I work out how far I have travelled?
- How do we measure distance in, and from, space?
- What is my location in my car, in a plane, on a ship?
- How does my phone know where I am?
- What is the history and basis of satellite positioning?
- Where is space?



What can I see?

- How does light travel through Space and what can our eyes see?
- What other wavelengths are there for Earth Observation?
- What's the smallest object we can see from space?
- What other energy can we use to sense the Earth's environment?
- What does Canada look like from Space?
- What does the Biosphere, Oceans and Cryosphere look like from space globally?



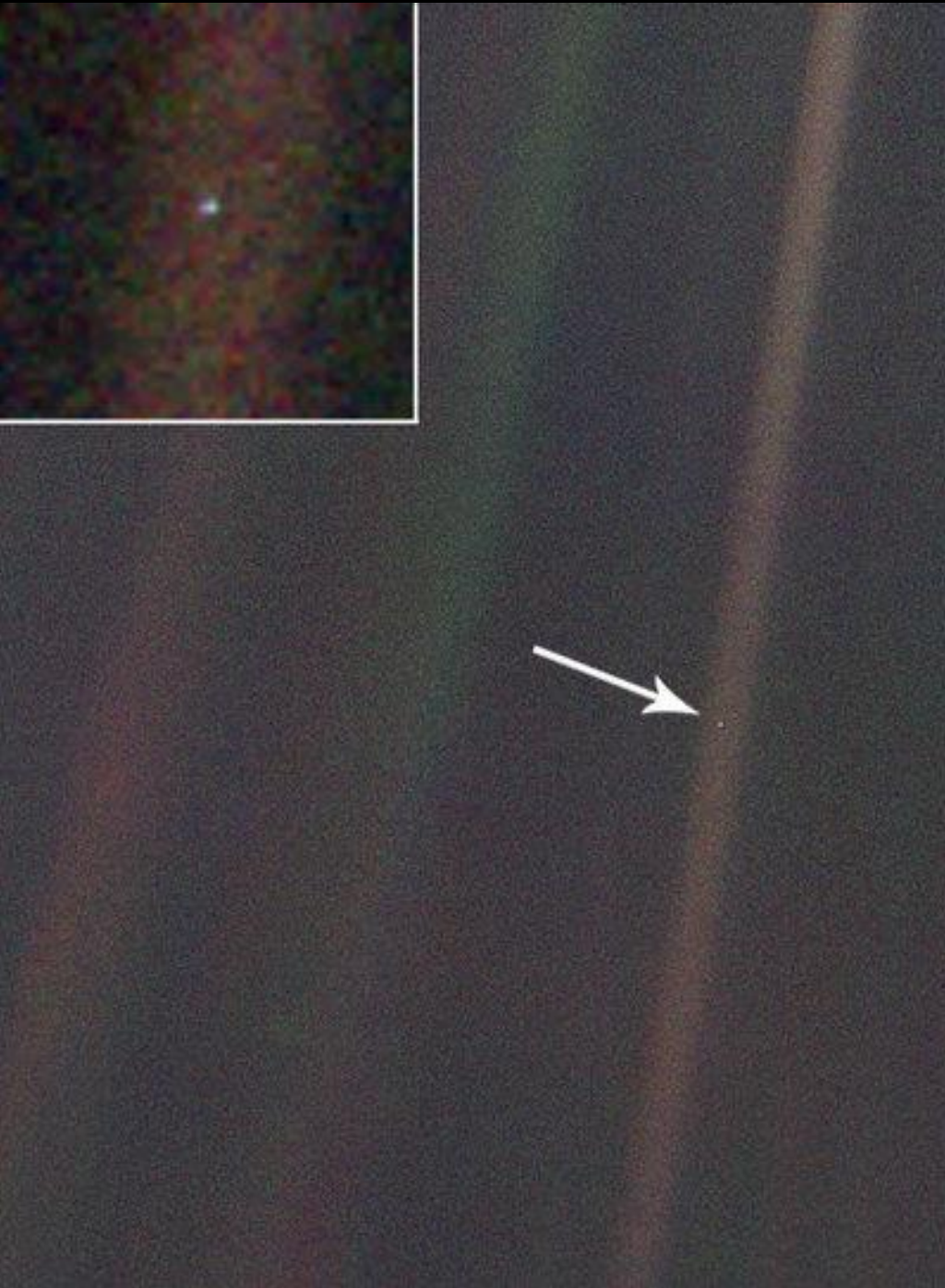
How is the Environment Changing?

- How can we observe different types of change on the Earth from space?
 - Cyclic, Abrupt, and Gradual change
- How does land change and land use look from space?
- What do the Oceans look like, and how are they changing?
- How do cities look from space?
- How can we monitor wildlife from space?
- What are the new frontiers of earth observation data?
- How can we use drones and drone imagery in earth observation?
- How can we use earth observation data to understand and quantify the human footprint?





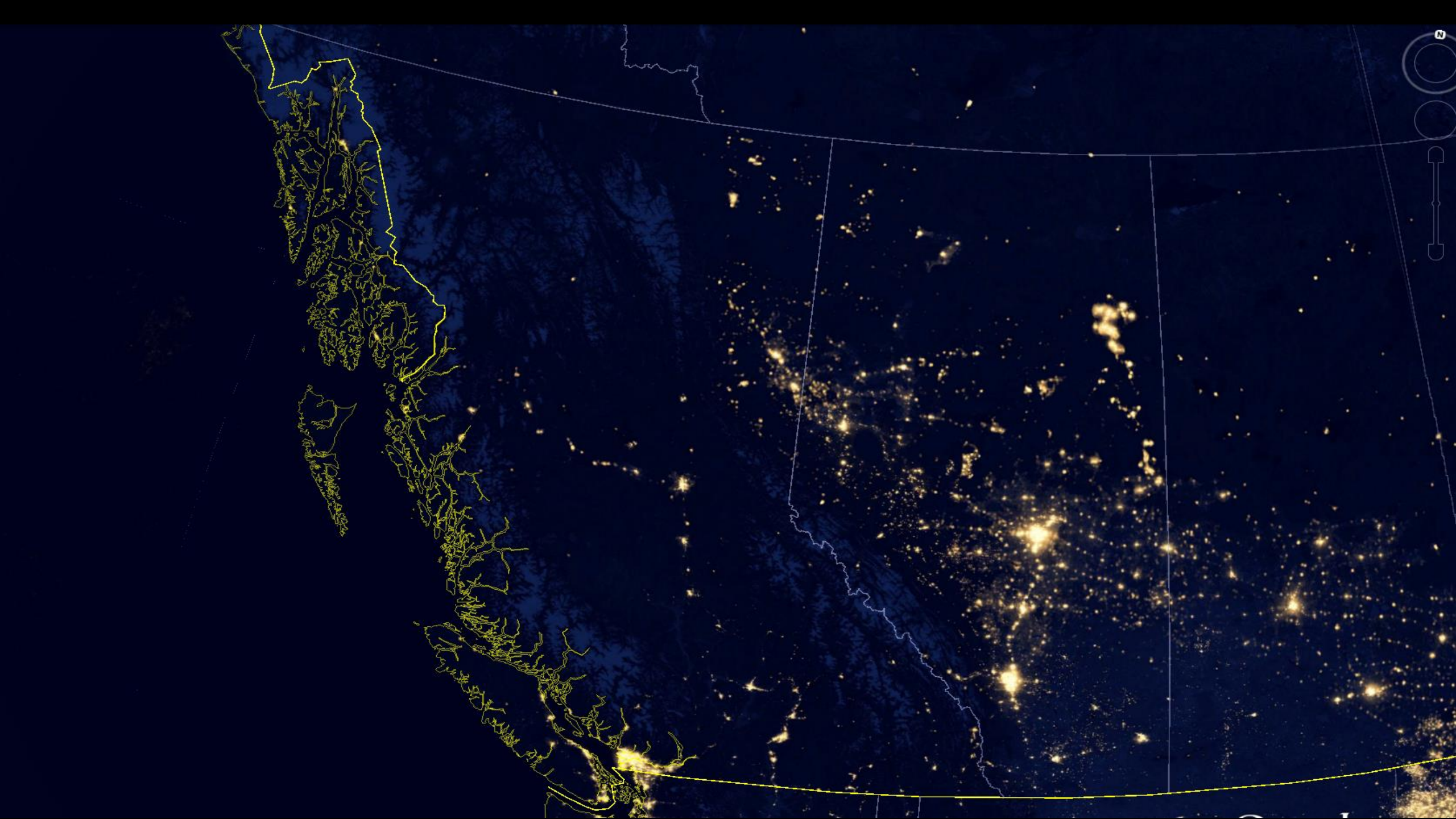
- Called “the most influential environmental photograph ever taken”
- It was taken on December 24th 1968 from Apollo 8 mission from a moon orbit



Taken in 1990 by NASA's Voyager 1 spacecraft, the "pale blue dot" photo shows what our planet looks like from 4 billion miles away.

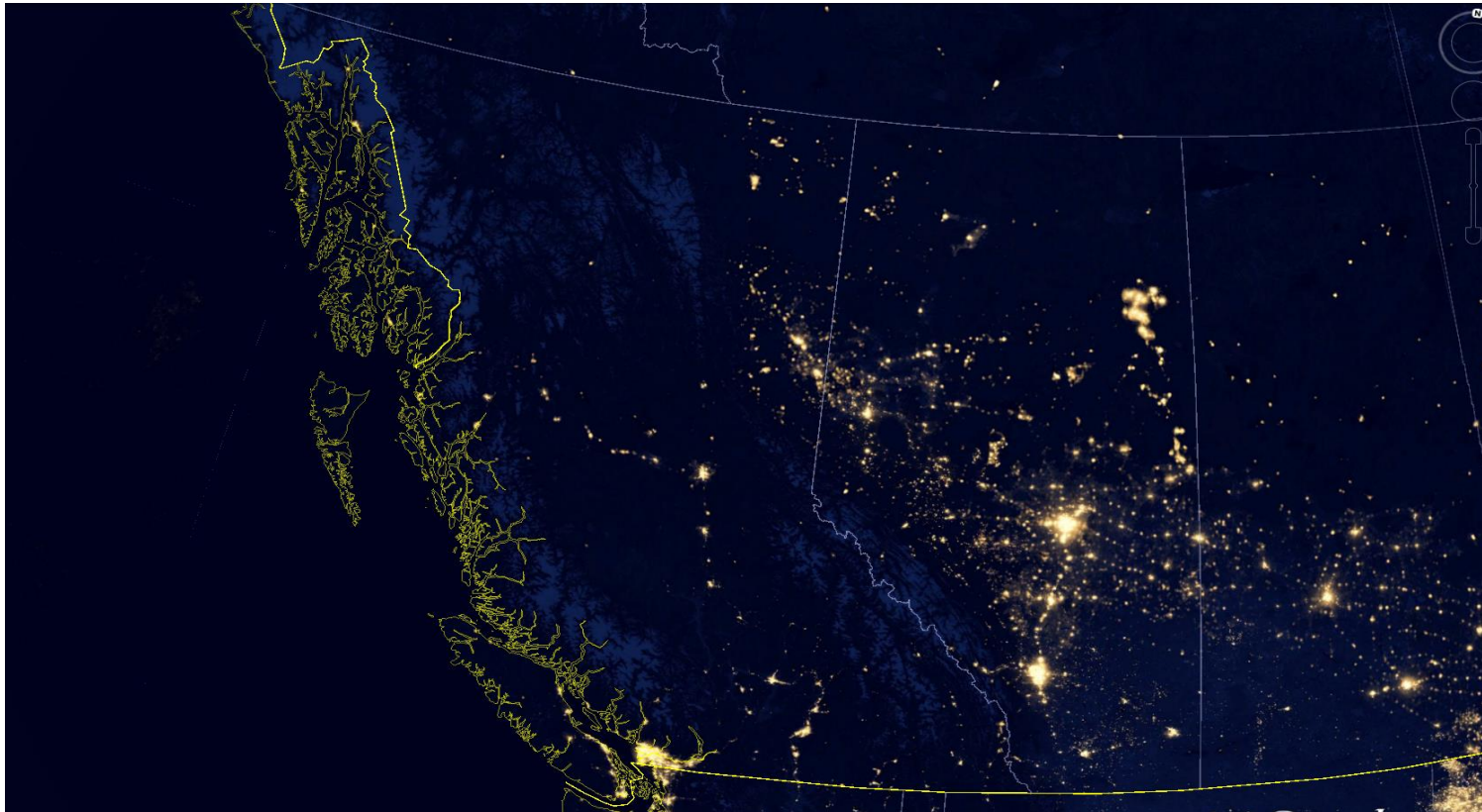
The pale streak over Earth is an artifact of sunlight scattering in the camera's optics.

It inspired the quote "the pale blue dot"



What patterns can we recognize on this image ?

- Can we name some cities ?
- Is it all urban environments ?



Tips and Tricks for Success in this Course



High School Teacher: I'm going to make this class difficult to prepare you for college.

College Professor: *plays slideshow full of memes*

Succeeding in this Course

- Ask questions on the appropriate discussion boards!
 - This is the #1 way to ensure you are understanding lecture content
 - Leanna and I will be constantly monitoring and replying
- Do the assignments
 - Ask/post questions for your TA
- Do the blog posts
 - Participation marks
- Do the practice questions we provide for the mid term and final



That's it for Introduction!

- Any questions?
- Post them on the general course questions discussion board!

