Donald W. Reynolds Center for the Visual Arts
E.L. Wiegand Gallery

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ORBITAL REFLECTOR

DARK SKIES LESSON

GRADE: 9-12

STANDARDS:

ART: VA:Cn10.1.IIa. Utilize inquiry methods of observation, research, and experimentation to explore unfamiliar subjects through art-making.

SCIENCE: HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

OBJECTIVE:

Students will be able to research and observe digital representations of light pollution in order to create art that illustrates the impact of light pollution on earth.

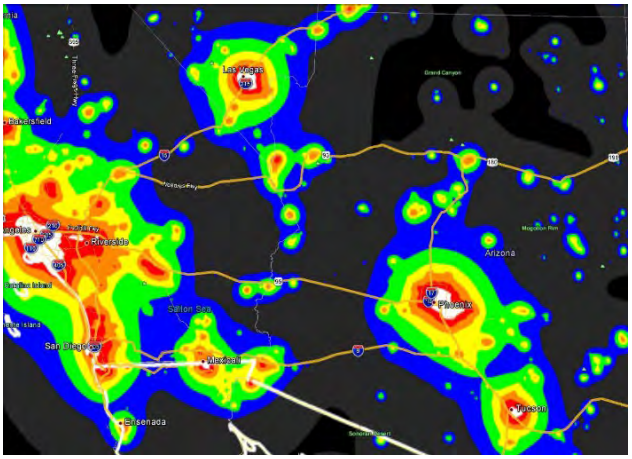
VOCABULARY:

Light Pollution: Brightening of the night sky caused by street lights and other man-made sources, which has a disruptive effect on natural cycles and inhibits the observation of stars and planets.

Dark Sky: Denoting or located in a place where the darkness of the night sky is relatively free of interference from artificial light.

Abstract: Art that does not attempt to represent external reality, but seeks to achieve its effect using shapes, forms, colors, and textures.

TIME: 3 Class Periods



MATERIALS:

- Student Journal or Notebooks
- Access to computers and internet
- Various art making supplies

LESSON:

ENGAGEMENT:

Show students an image of Orbital Reflector, and of the view of Orbital Reflector from the surface of the earth.

Pose the following question to students: **What do you see when you look up at the night sky? What do you really notice about outer space?**

Give students ample time to consider their answers and record them in a journal or notebook.

Have students discuss their answers as a class. Most students are not paying much attention to the night sky or maybe cannot see much because they live in a city that never gets very dark. Take the time to work through these discussions.

Share the following idea with students: Trevor Paglen created *Orbital Reflector*, in part, to draw our attention to the night sky and to think about it in new and more

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engaging ways. The night sky is not separate from us, and the things we continue to put in orbit around our planet are there, even if we're not paying attention.

Allow students to discuss this idea in depth. What are we paying attention to, and what should we be paying attention to? How can we take better care of the night sky?

EXPLORATION:

Show students the video:
SciShow: The Strange Scourge of Light Pollution
available on YouTube
(https://www.youtube.com/watch?v=_nlFcEj41Xk).

During the video, have students record 12 facts about light pollution.

After the video, ask students in small groups to define light pollution. Share their definitions with the whole class and record a working definition for everyone.

Students should be able to answer the question: What is light pollution and why does it matter?

EXPLANATION:

Show students various light pollution maps. Have them practice close looking and record some ideas about what they are seeing.

Show students various abstract artworks. Have them practice close looking and record some ideas about what they are seeing.

Ask the students, how are these images similar? What elements and principles of design (shape, line, color, etc.) do they have in common? If we removed the map elements, the city names, roads, and geopolitical boundaries, the map takes on an abstract quality. It becomes an artwork that represents an idea.

Challenge students to create an abstract artwork based on a light pollution map.

ELABORATION:

Each student will need to pick a geographic location, this could be a city, a state, a country or a continent.

Students will need to research information on light pollution in that particular location. Have students find digital maps and computational representations to gather visual information and data on their location.

They will want to take some notes on their area as well as get some color printouts or saved images of the site.

Encourage students to use the following resources:

https://www.lightpollutionmap.info

http://darksitefinder.com/maps/world.html

From this computer-generated data, students will need to create an artwork. They may work in any medium, but their artwork needs to explore and reflect the geographic location they have selected. It should tell a story about how humans are living on that part of the earth, and the presence or absence of light pollution.

They may want to paint, work in paper collage, or any medium of their choosing. Give them ample time to create, refine, and complete their artworks.

EVALUATION:

Have students present their completed artworks. In their presentation, they should discuss the presence or absence of light pollution in their area, and how that is being represented in the artwork they created.

It may be interesting to have students try to guess both the location the artwork represents, the degree of light pollution in that given area, and if they were inspired by a particular artist or artwork.

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EXTENSION:

Have students participate in the Citizen Science project "Globe at Night" to get a better understanding of how light pollution is impacting the region they live in.

https://www.globeatnight.org/

Have students complete the activity, "Engineering a World Without Light Pollution" from the Great Basin Observatory website.
http://www.greatbasinobservatory.org/lesson-plans/engineering-world-without-light-pollution

LINKS AND RESOURCES:

https://www.youtube.com/watch?v=_nIFcEj41Xk

https://www.lightpollutionmap.info

https://www.globeatnight.org/

http://www.greatbasinobservatory.org

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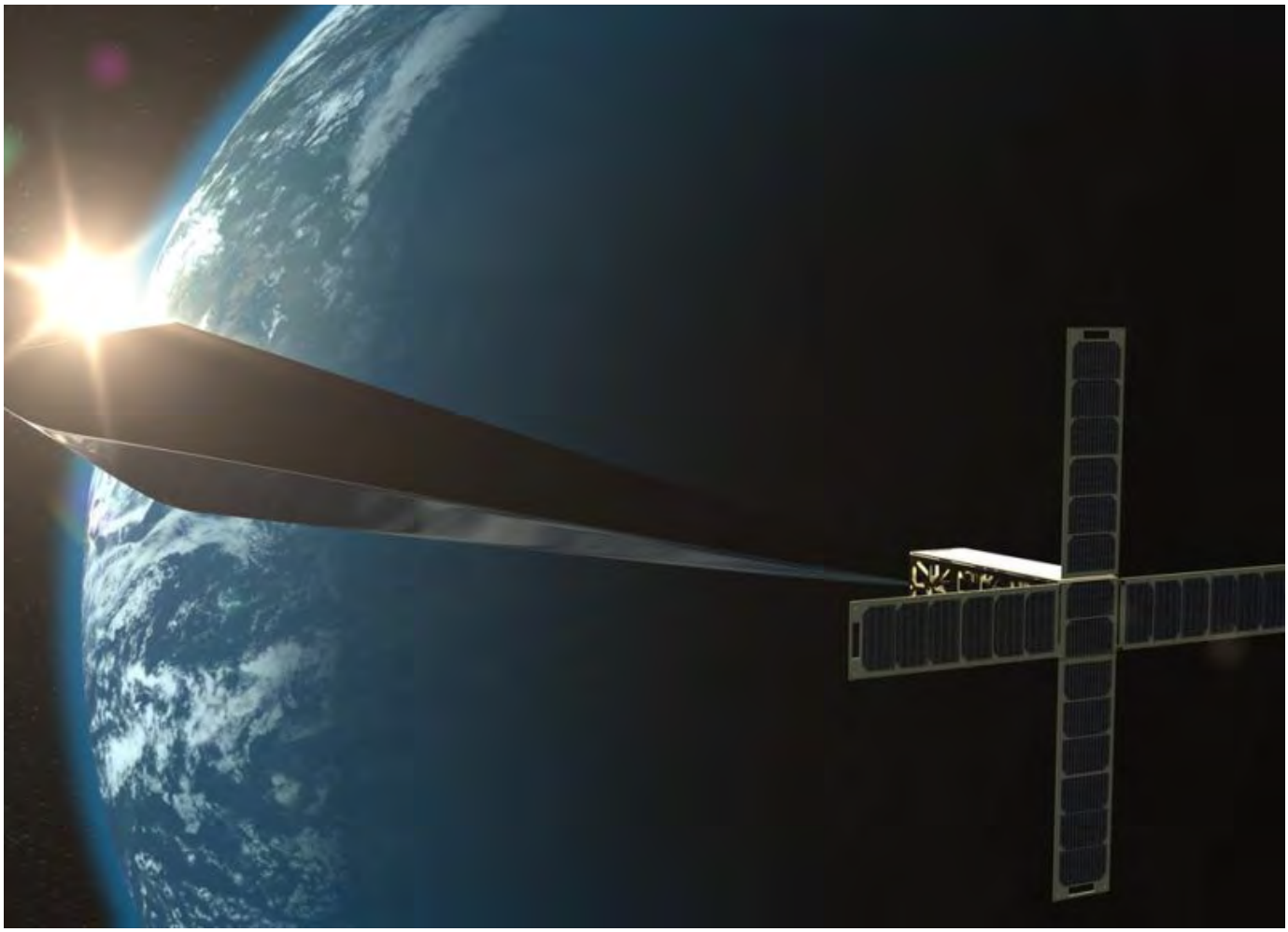

Figure 1 Orbital Reflector

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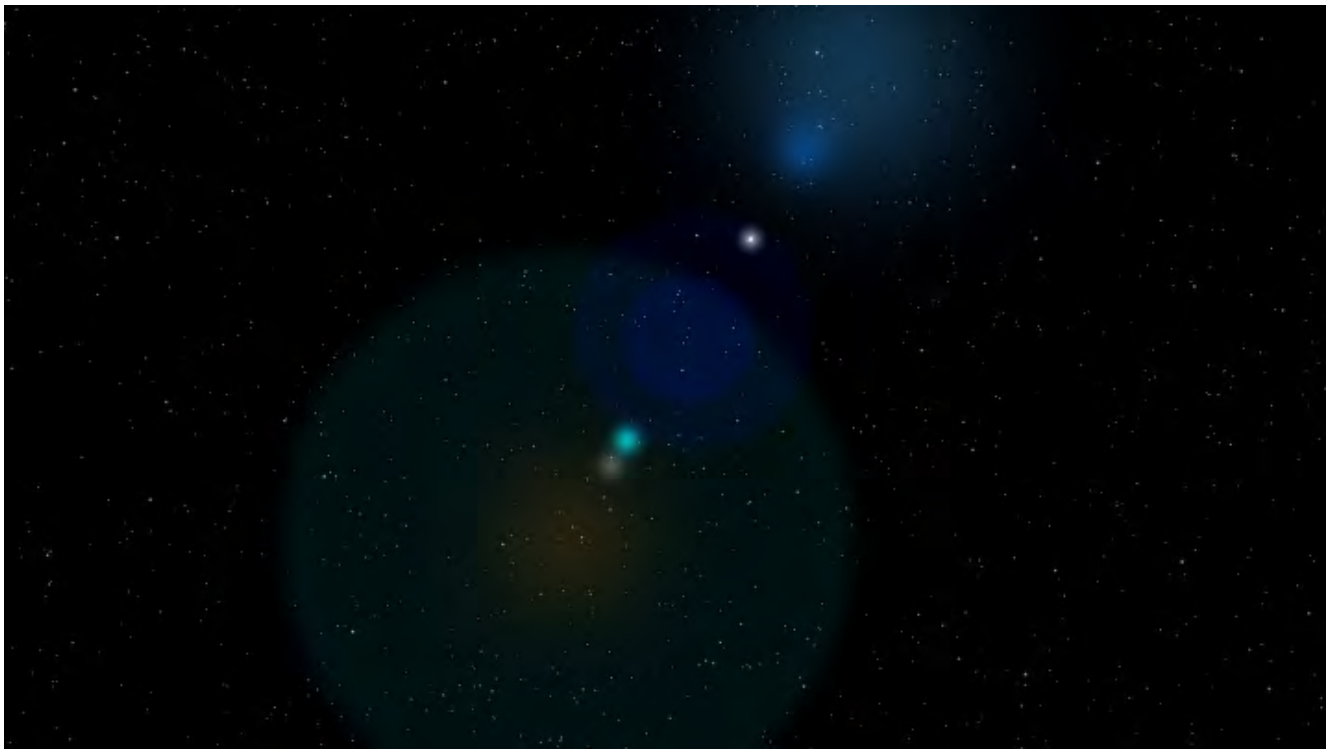

Figure 2 Orbital Reflector in Orbit

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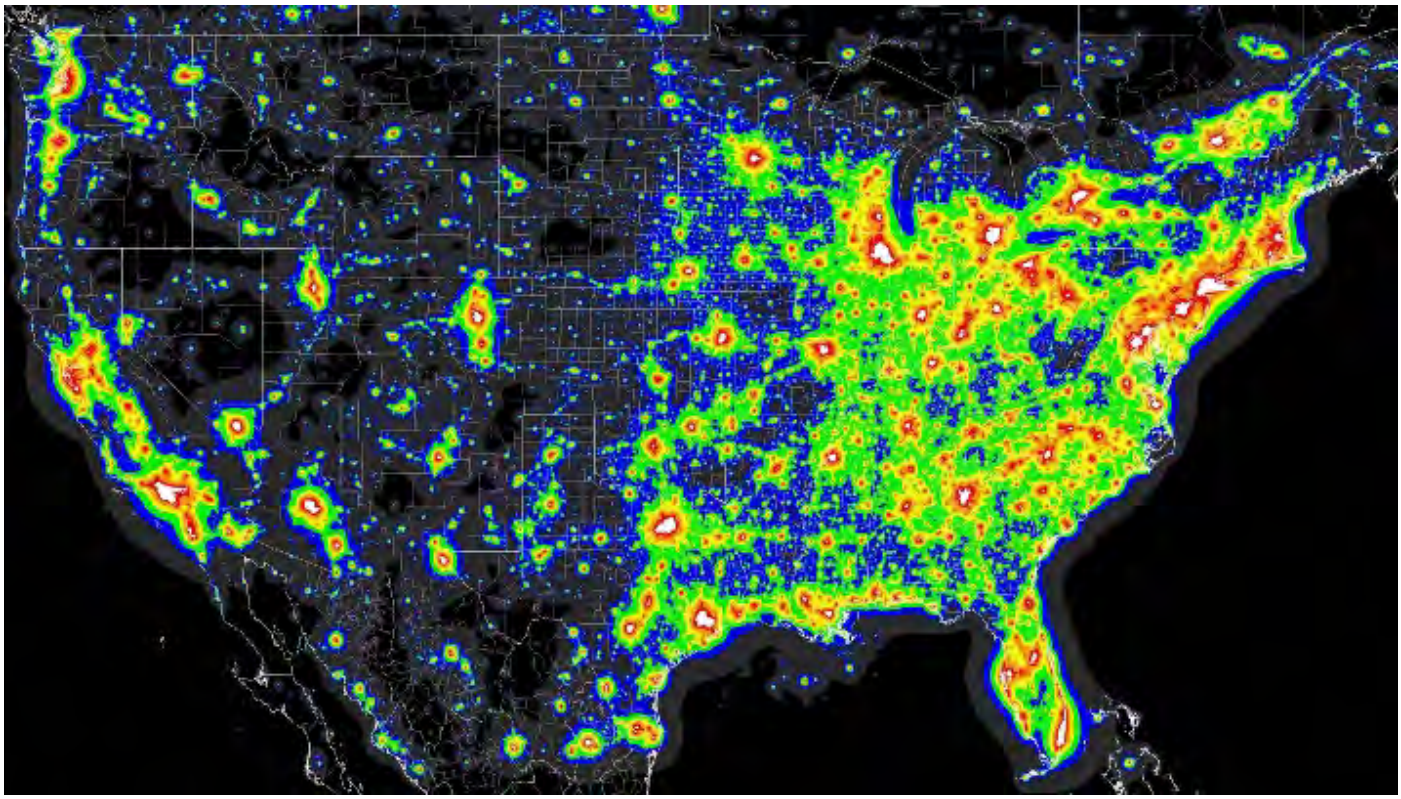

Figure 3 Light Pollution Map, US

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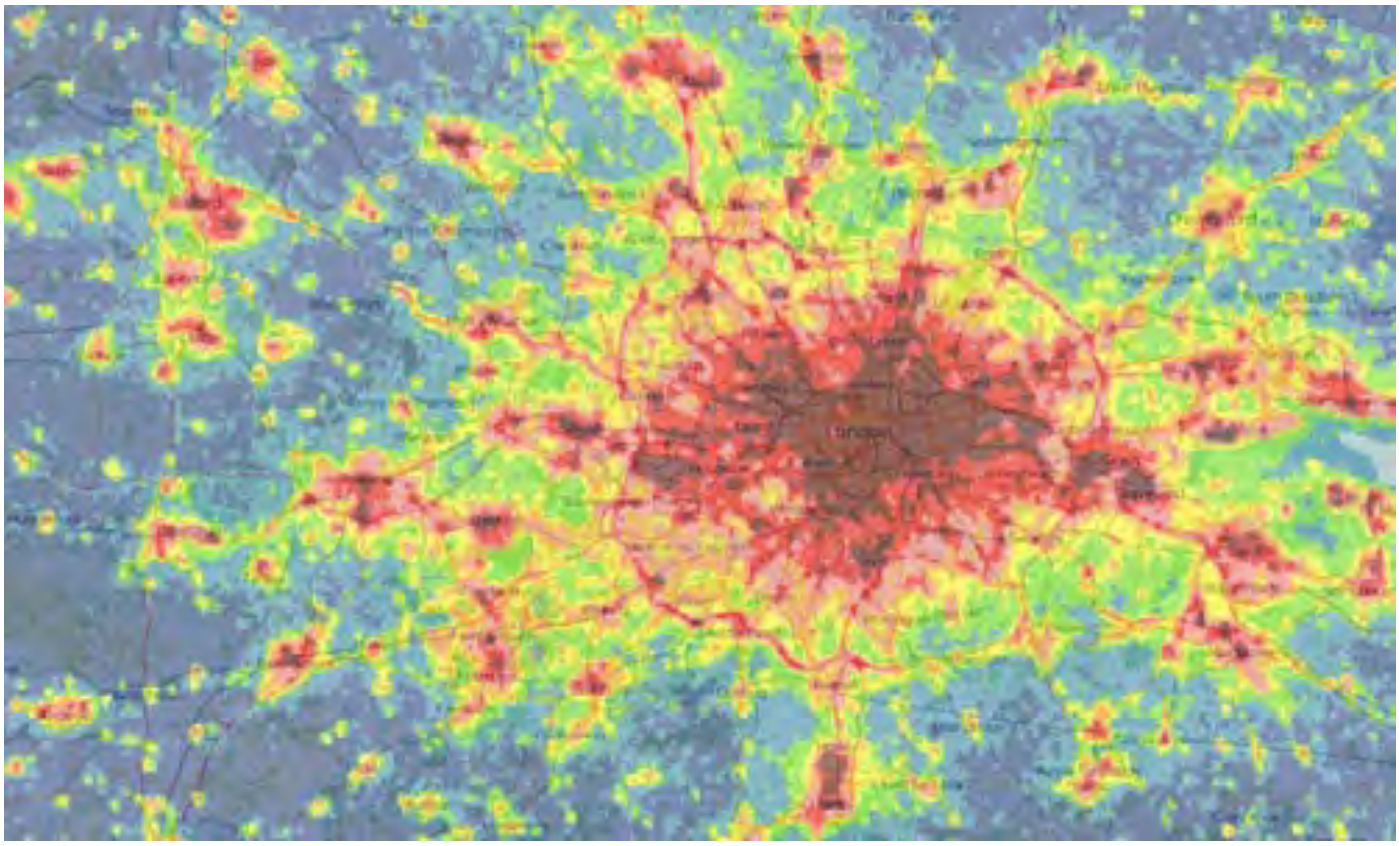

Figure 4 Light Pollution Map, State

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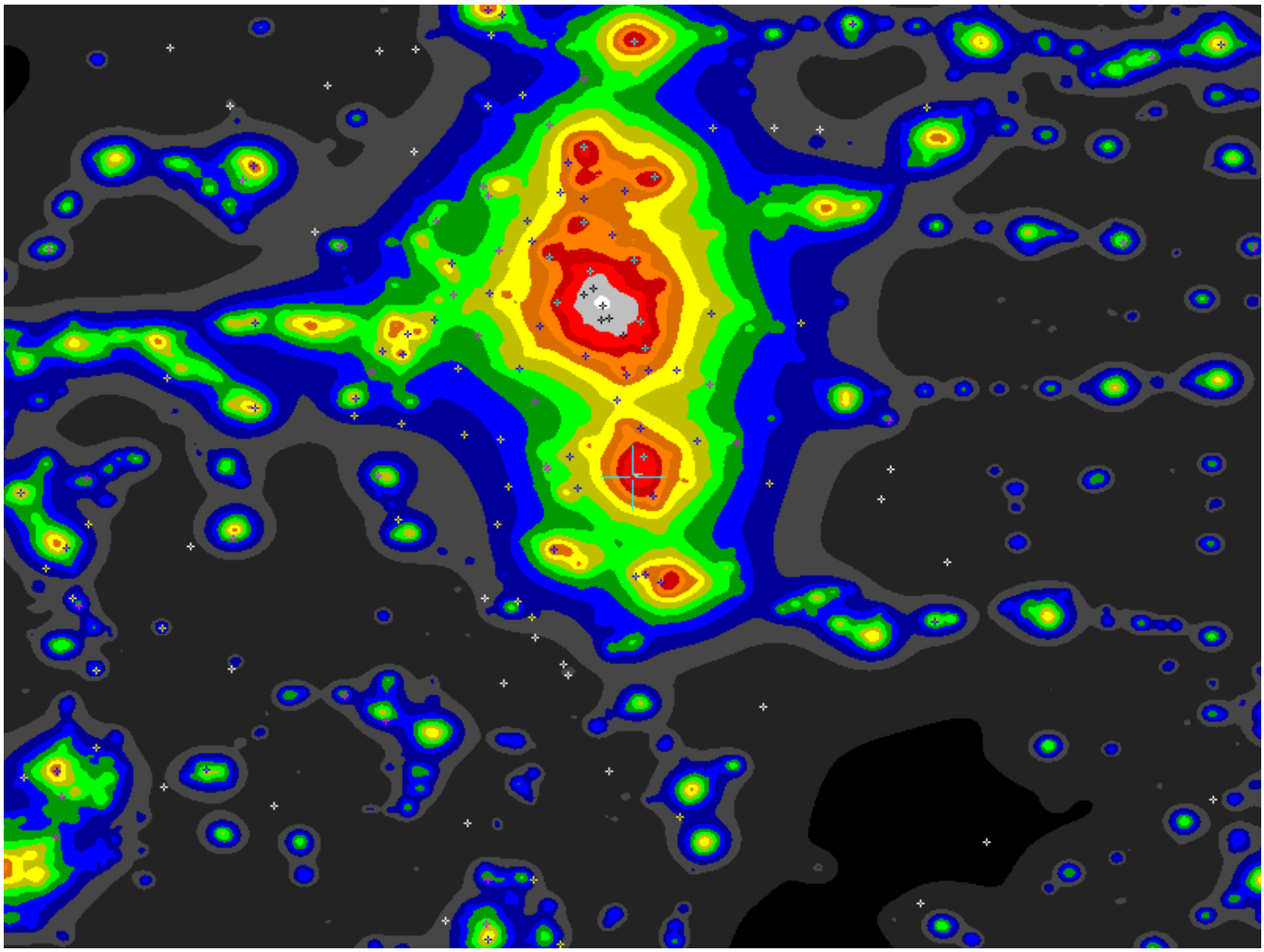

Figure 5 Light Pollution Map, City

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Figure 6 Wassily Kandinsky, Color Study, 1913

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Figure 7 Joan Mitchell, Blueberry, 1969

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