La notte non è più quella di una volta

Come la luce artificiale danneggia gli organismi viventi

Aosta, 23 novembre 2023

Région Autonome Vallée d'Aoste
Regione Autonoma Valle d'Aosta

Museo Regionale di Scienze Naturali Efisio Noussan | Castello di Saint-Pierre

ARPA Valle d'Aosta

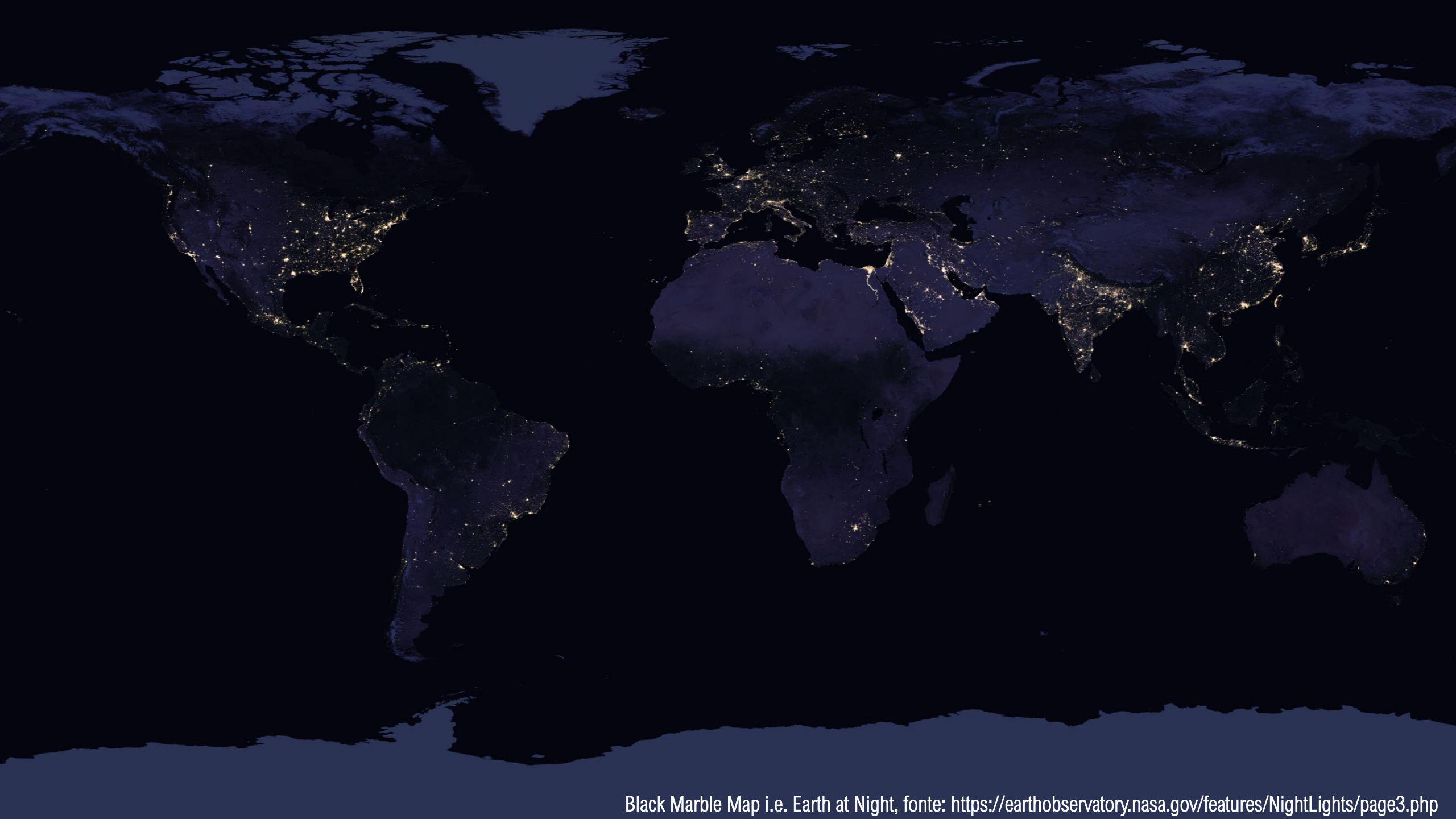
VIVA Valle d'Aosta unica per natura

Osservatorio Astronomico della Regione Autonoma Valle d'Aosta Planetario di Lignan
Observatoire Astronomique de la Région Autonome Vallée d'Aoste Planétarium de Lignan

Cosa vuoi che sia.

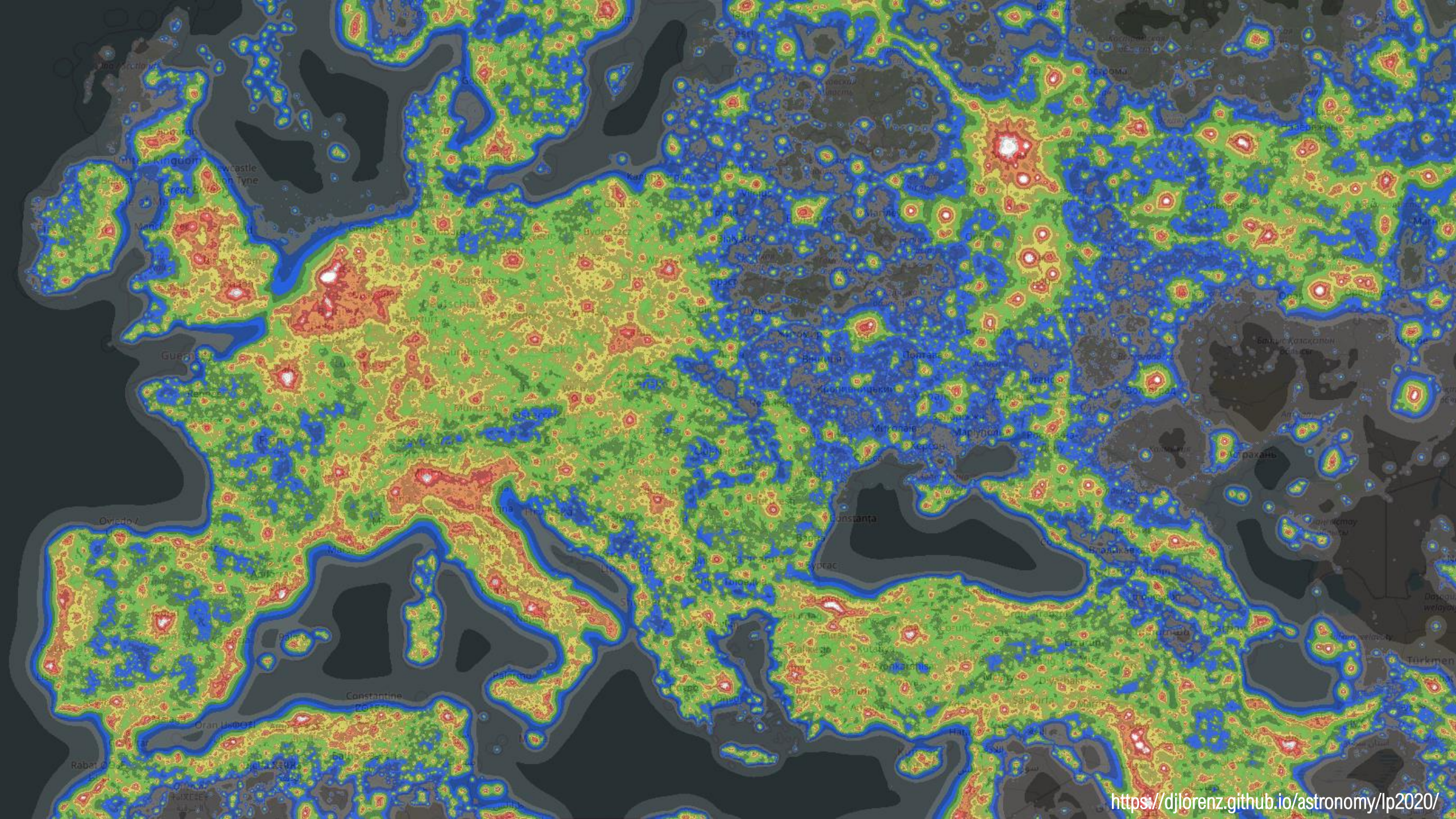
Un inquinamento
di serie B…

…o forse no?



Black Marble Map i.e. Earth at Night, fonte: https://earthobservatory.nasa.gov/features/NightLights/page3.php

Black Marble Map i.e. Earth at Night, fonte: https://earthobservatory.nasa.gov/features/NightLights/page3.php


https://djlorenz.github.io/astronomy/lp2020/

https://skyglowproject.com/#light-pollution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50 mi
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Clermont-Ferrand
Villeurbanne
Saint-Etienne
Chambéry
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Valence
Mont Mézenc
Avignon
Nîmes
Montpellier
Arles
Aix-en-Provence
Cannes
Nice
MONACO
Aosta
Biella
Varese
Como
Bergamo
Brescia
Novara
Milano
Monza
Vercelli
Pavia
Cremona
Piacenza
Asti
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Cuneo
Savona
Genova
Parma
Reggio Emilia
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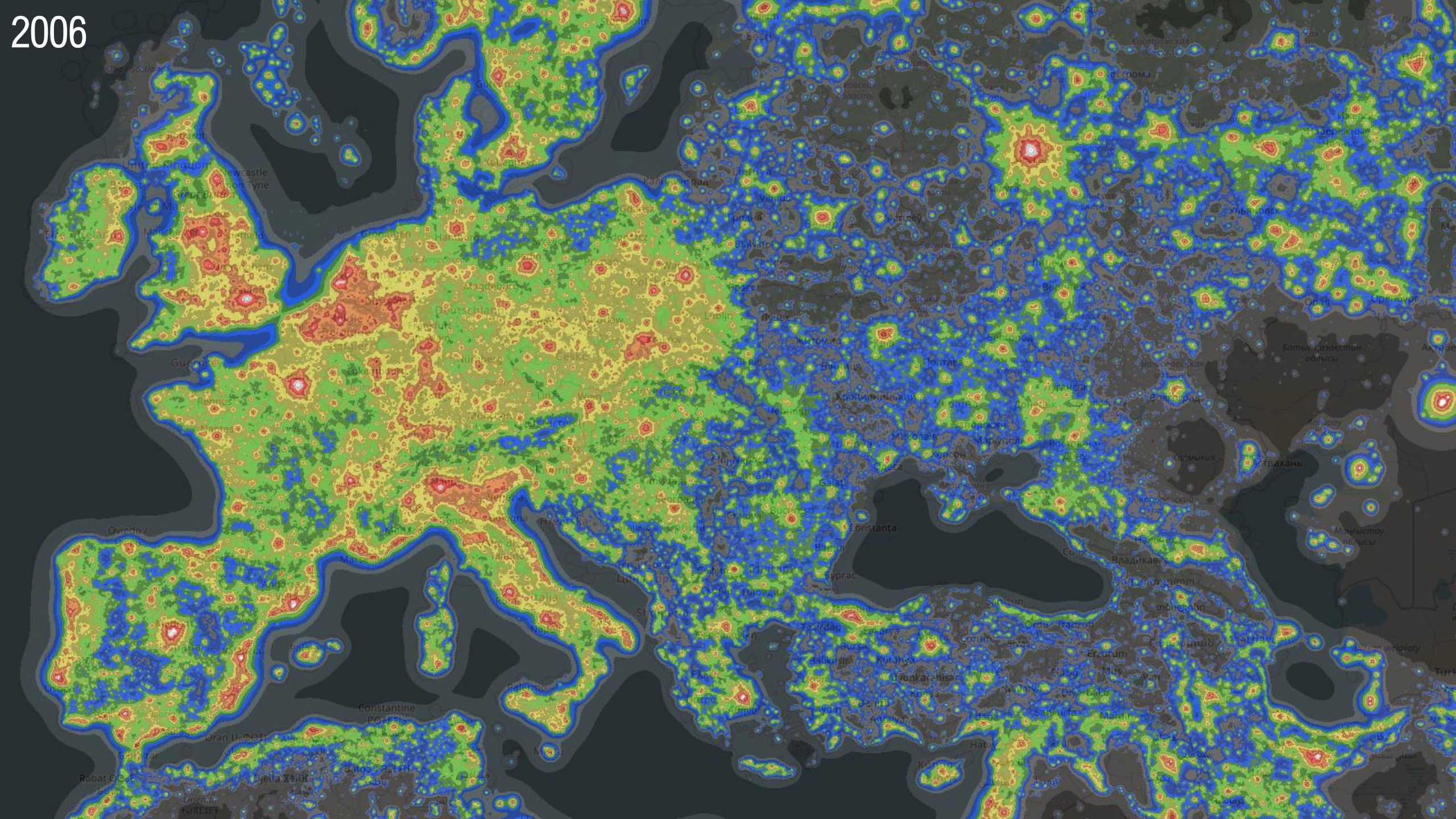
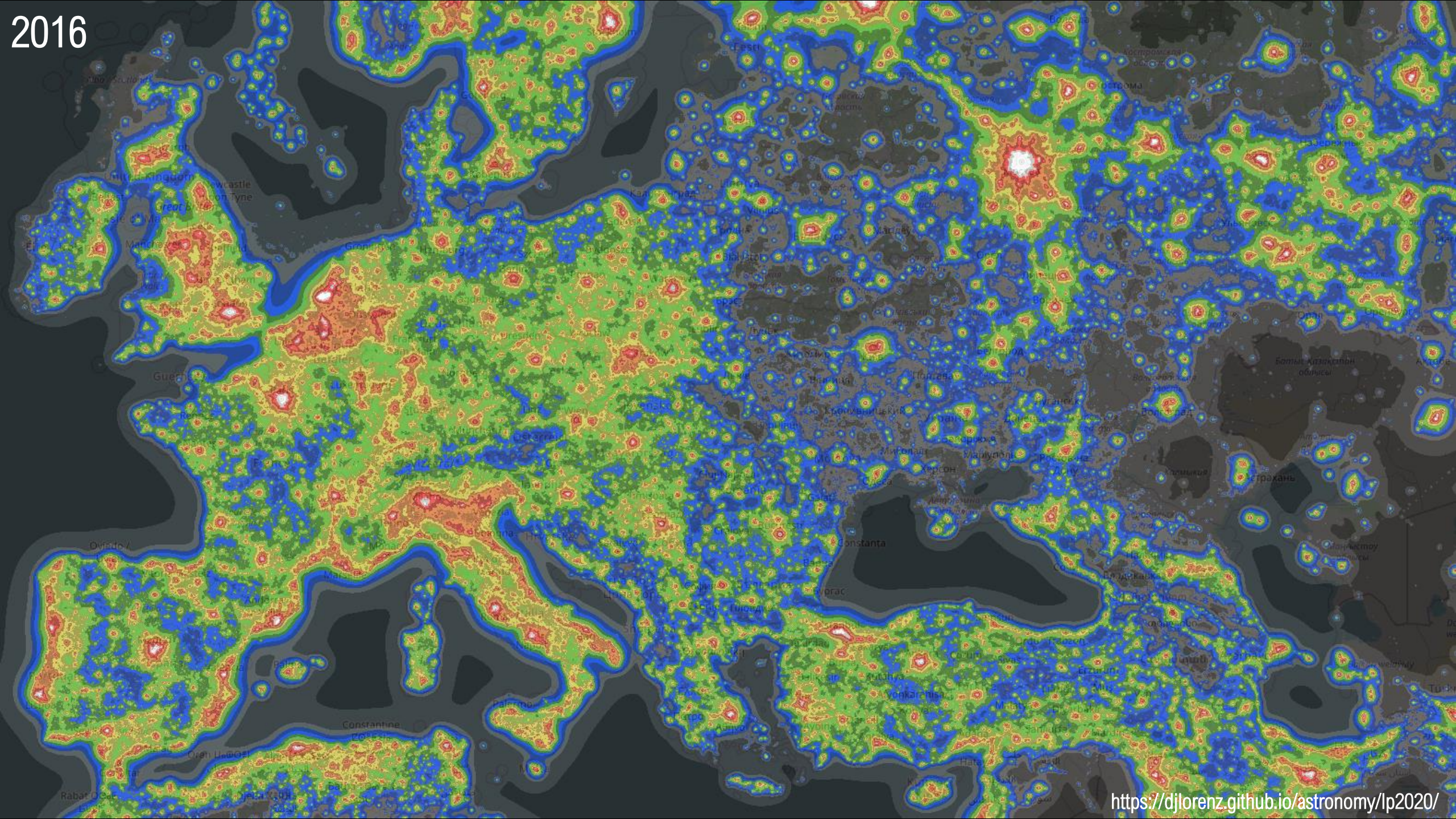

2006


2016
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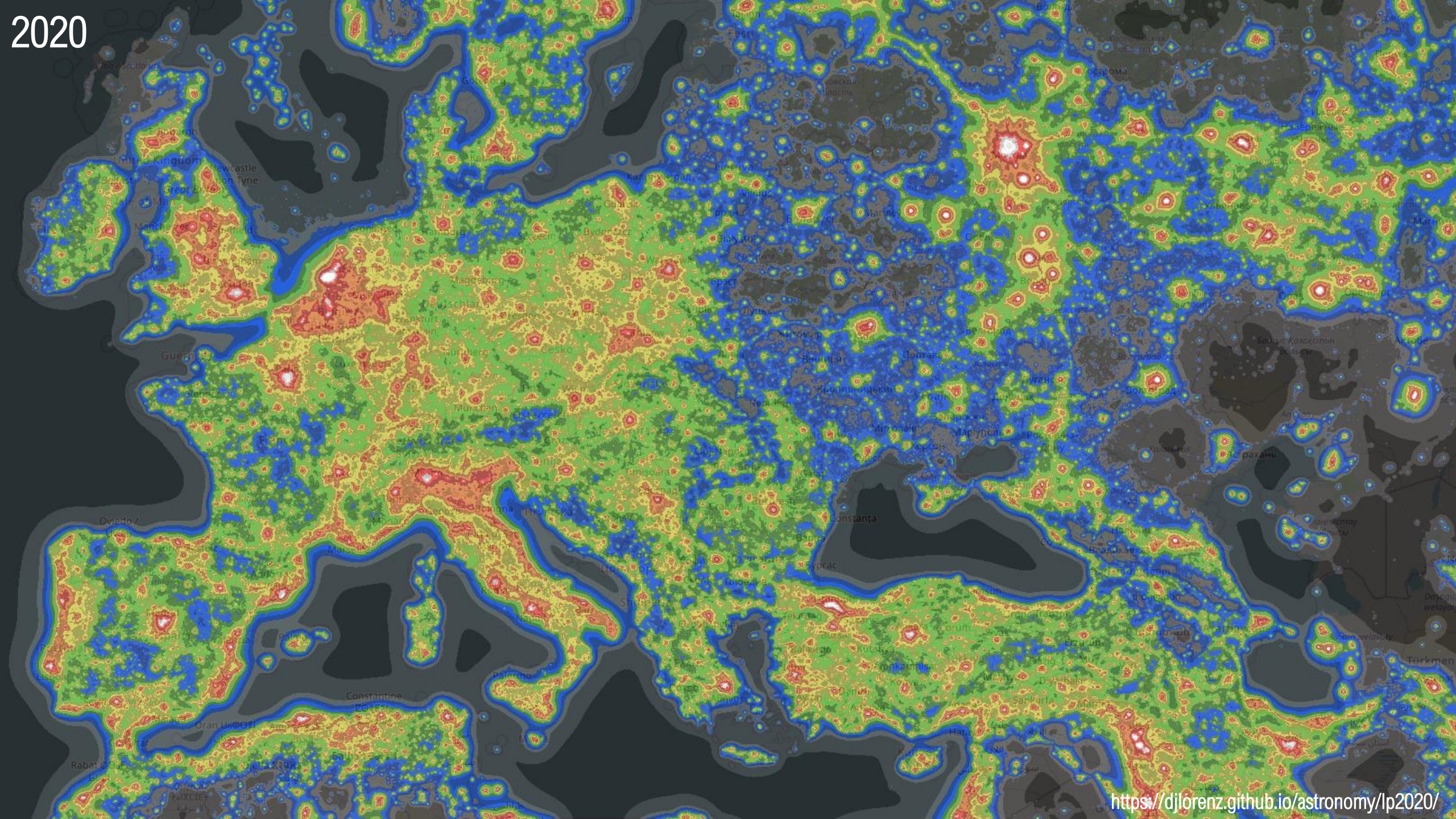
2020
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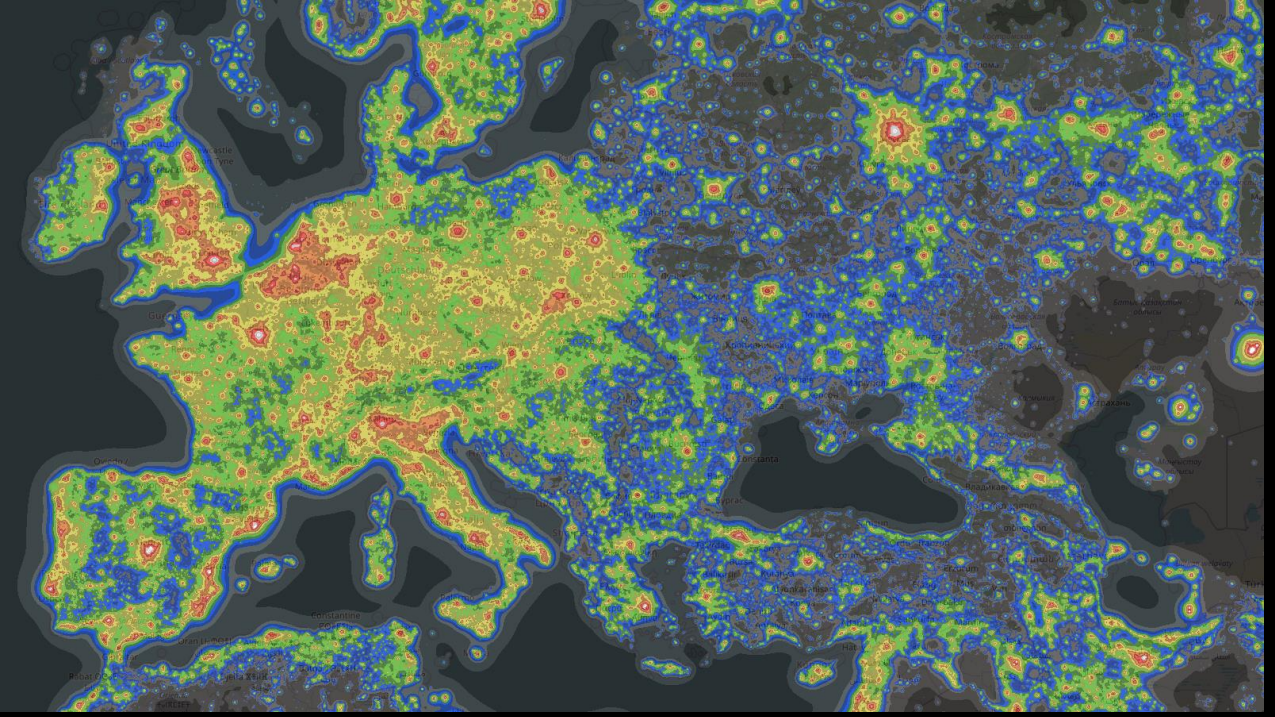
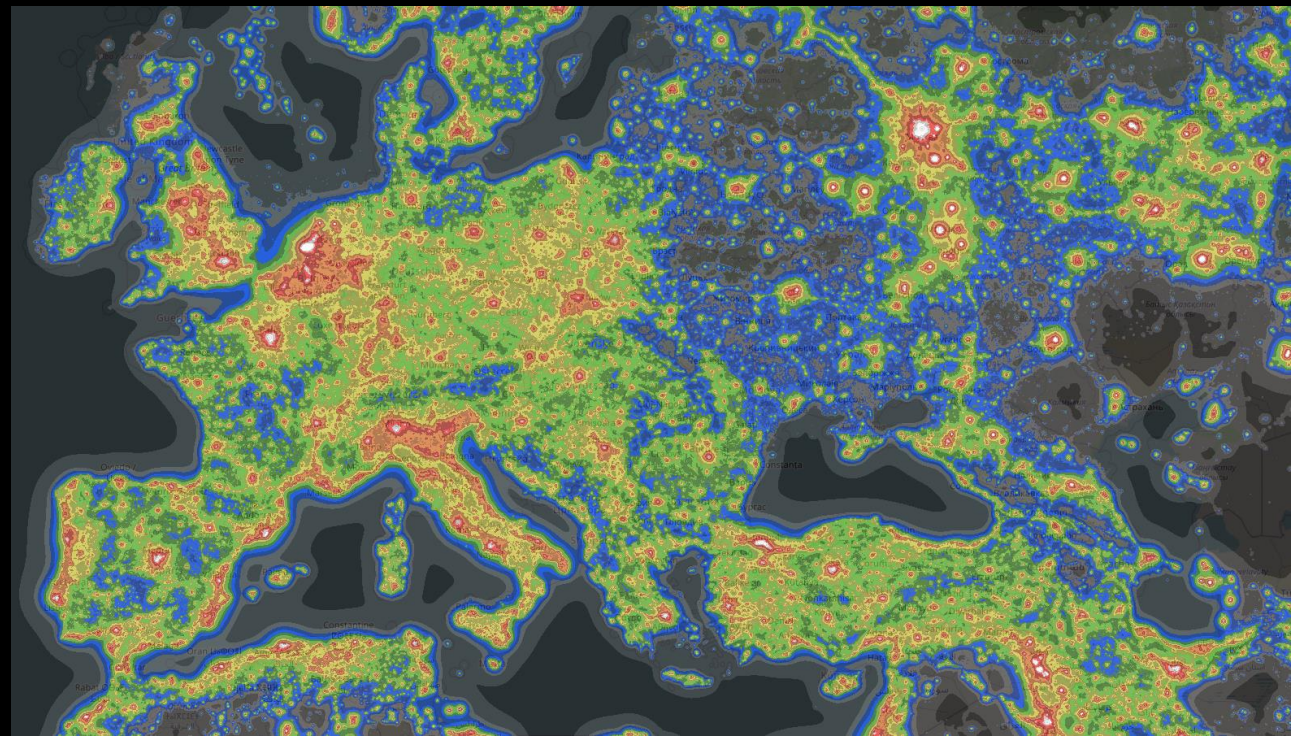


2006

2020



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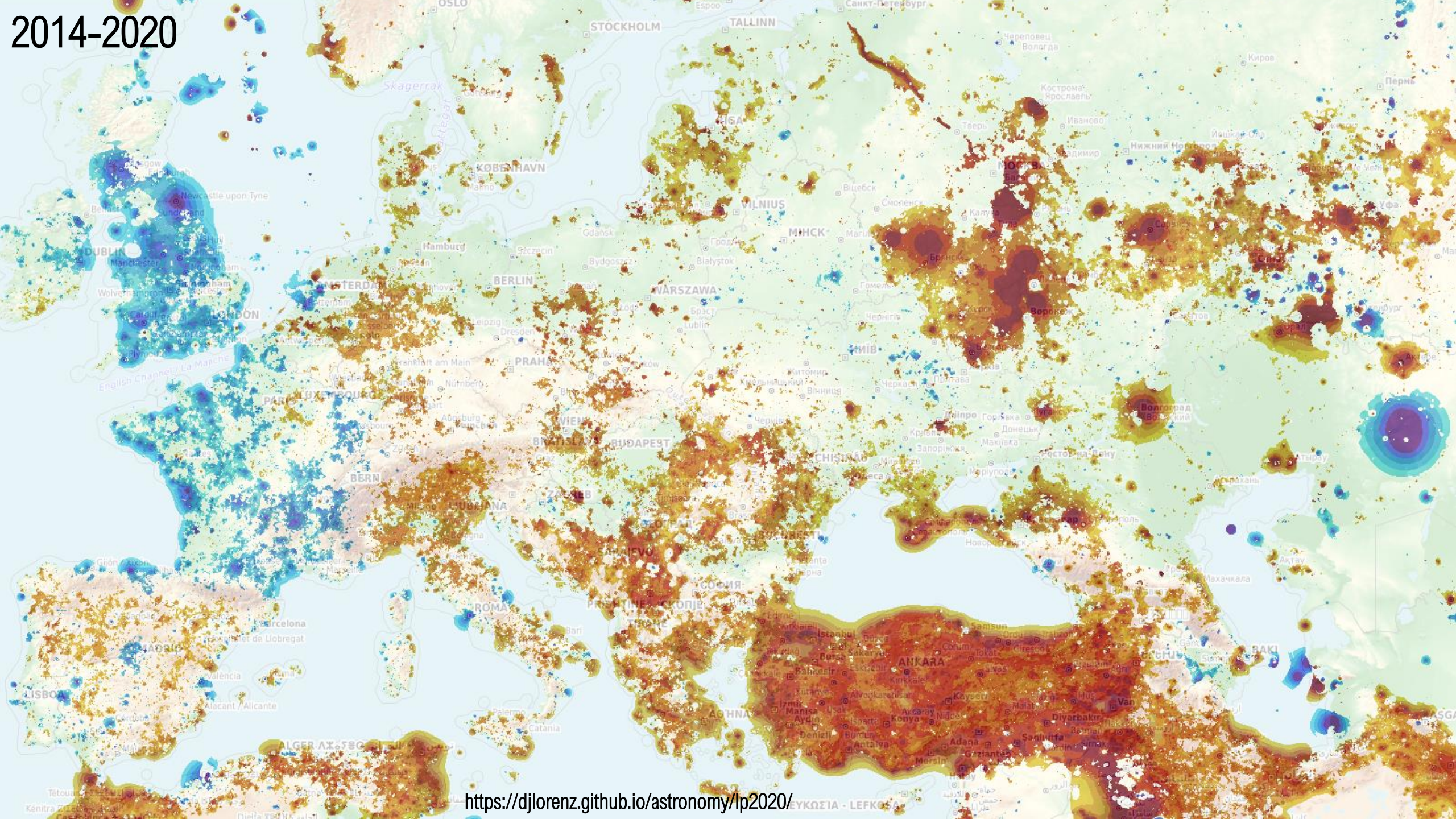
2014-2020
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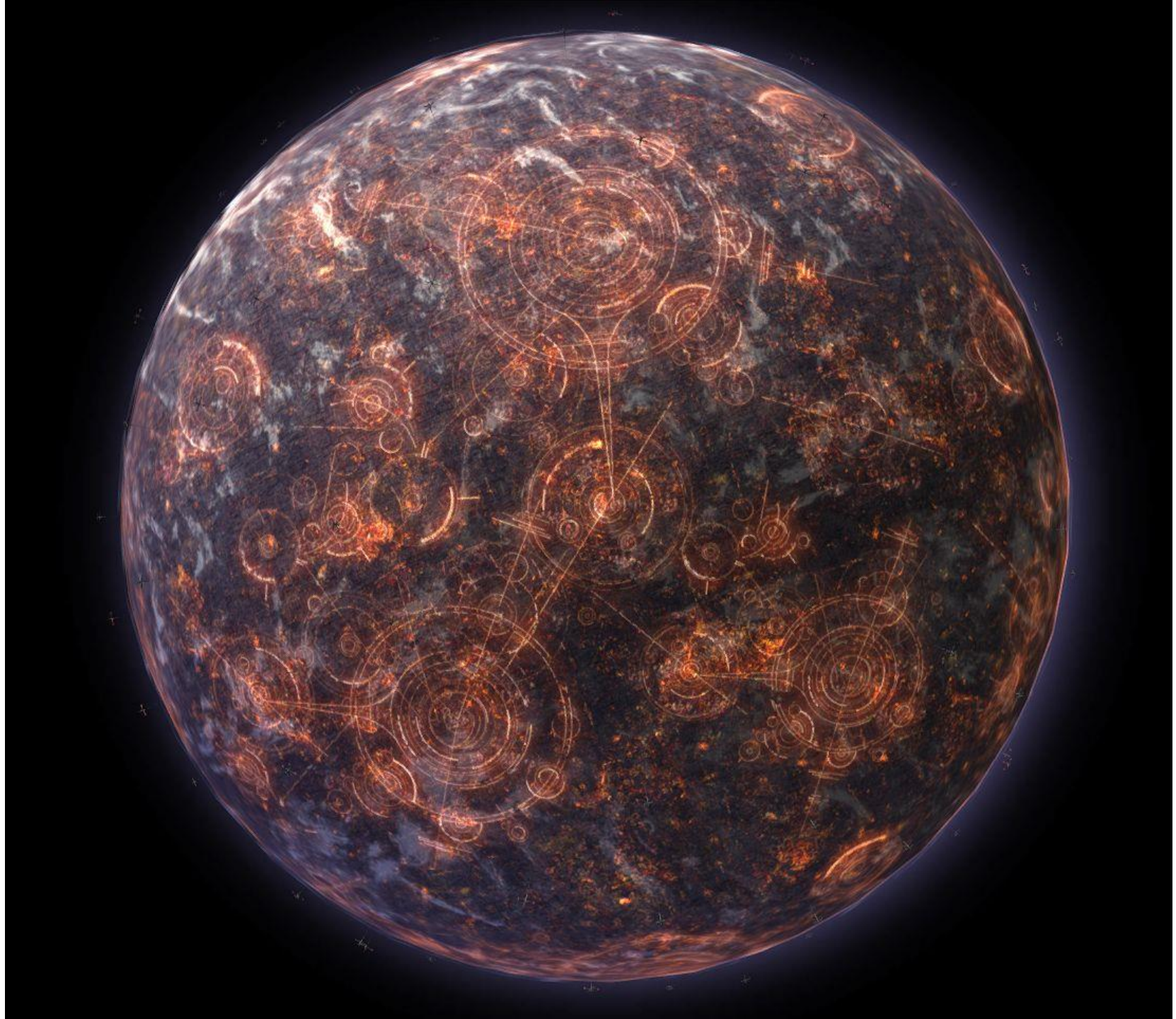


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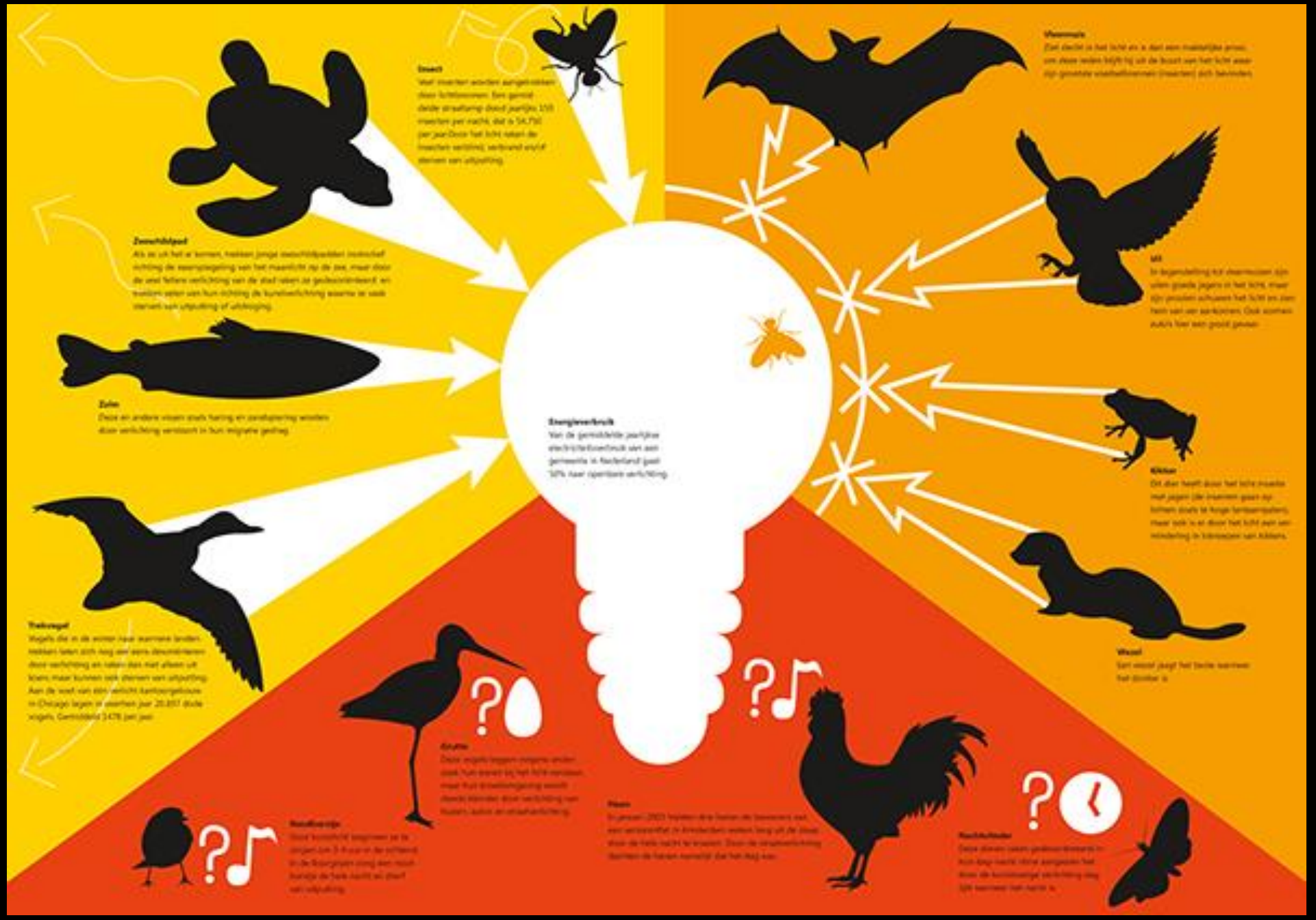
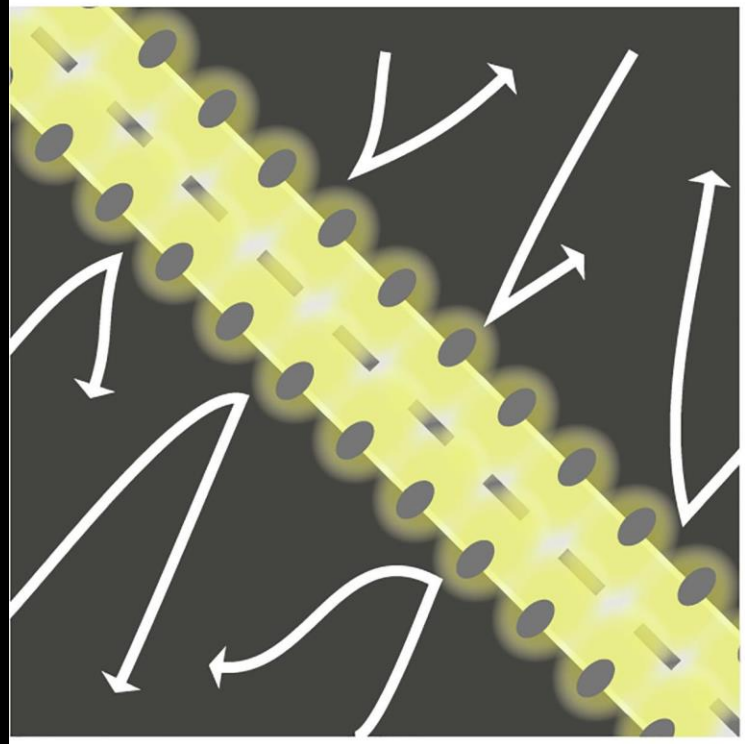
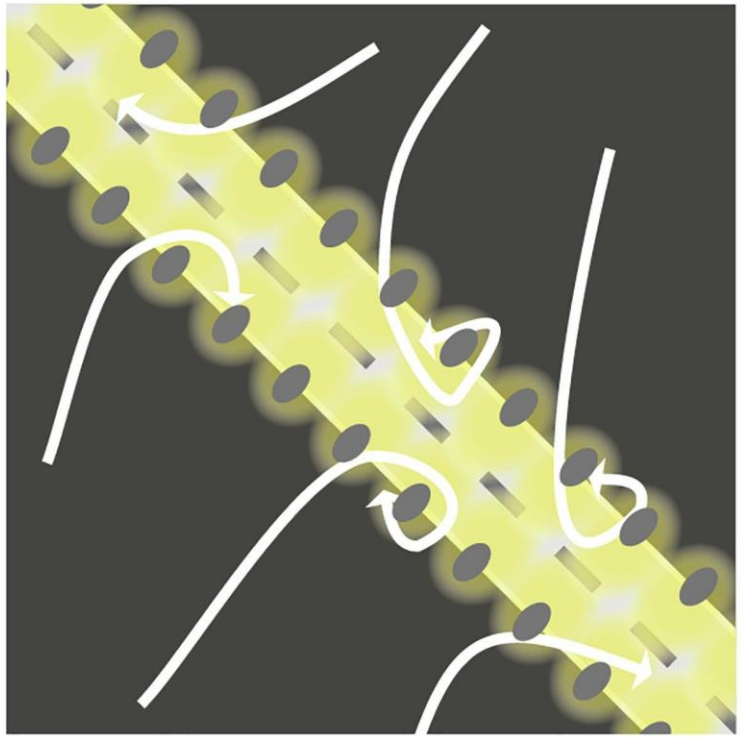


Avoiding barrier effect



Terrestrial mammals (e.g. Bliss-Ketchum *et al.*, 2016), Bats (e.g. Bhardwaj *et al.*, 2020), Amphibians (e.g. Van Grunsven *et al.*, 2017)

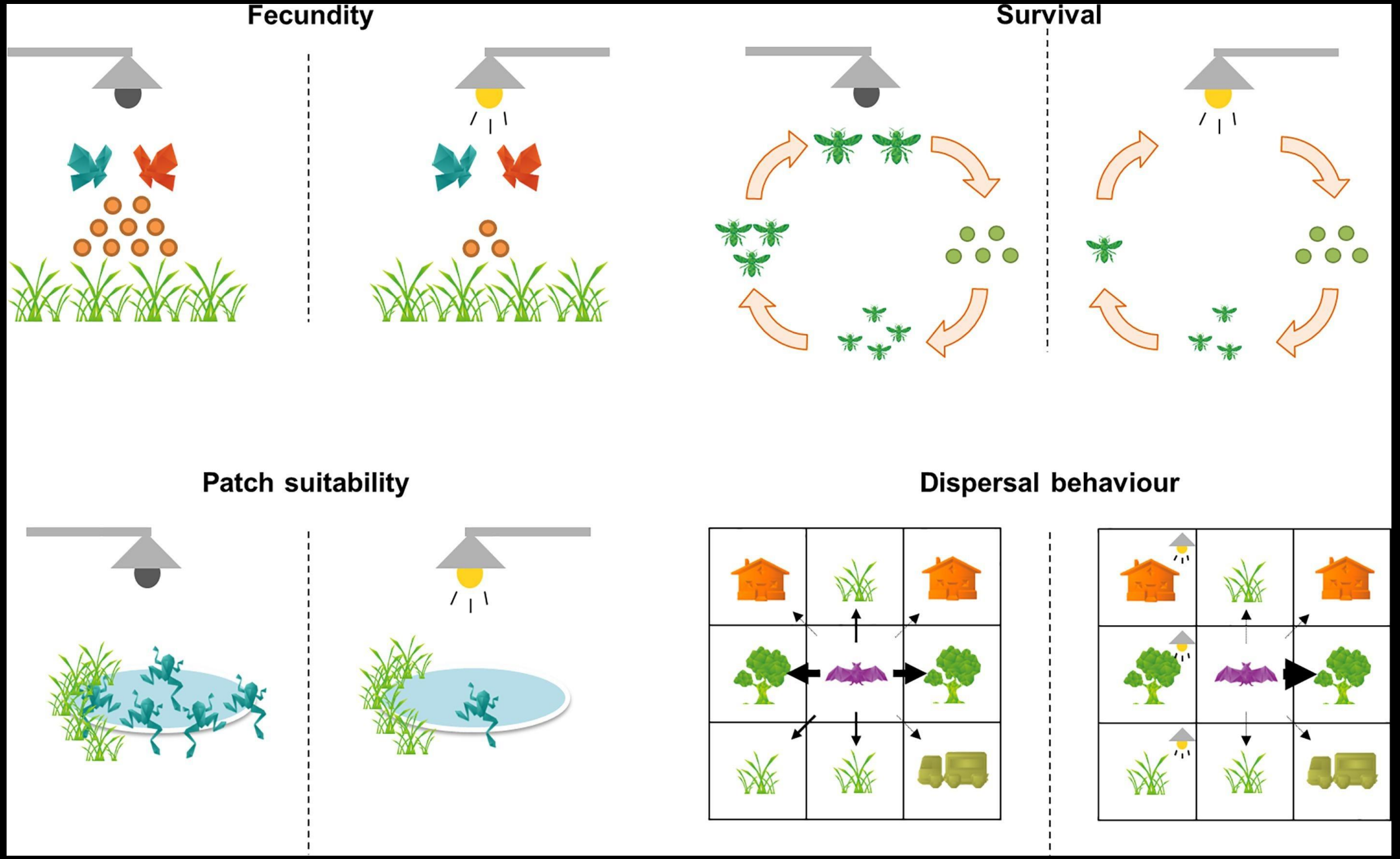
Sink/Crash barrier effect



Insects (e.g. Degen *et al.*, 2016 ; theorized by Eisenbeis, 2006), Possibly Birds (e.g. Longcore *et al.*, 2013)

Sordello et al. (2022) A plea for a worldwide development of dark infrastructure for biodiversity – Practical examples and ways to go forward.

https://doi.org/10.1016/j.landurbplan.2021.104332

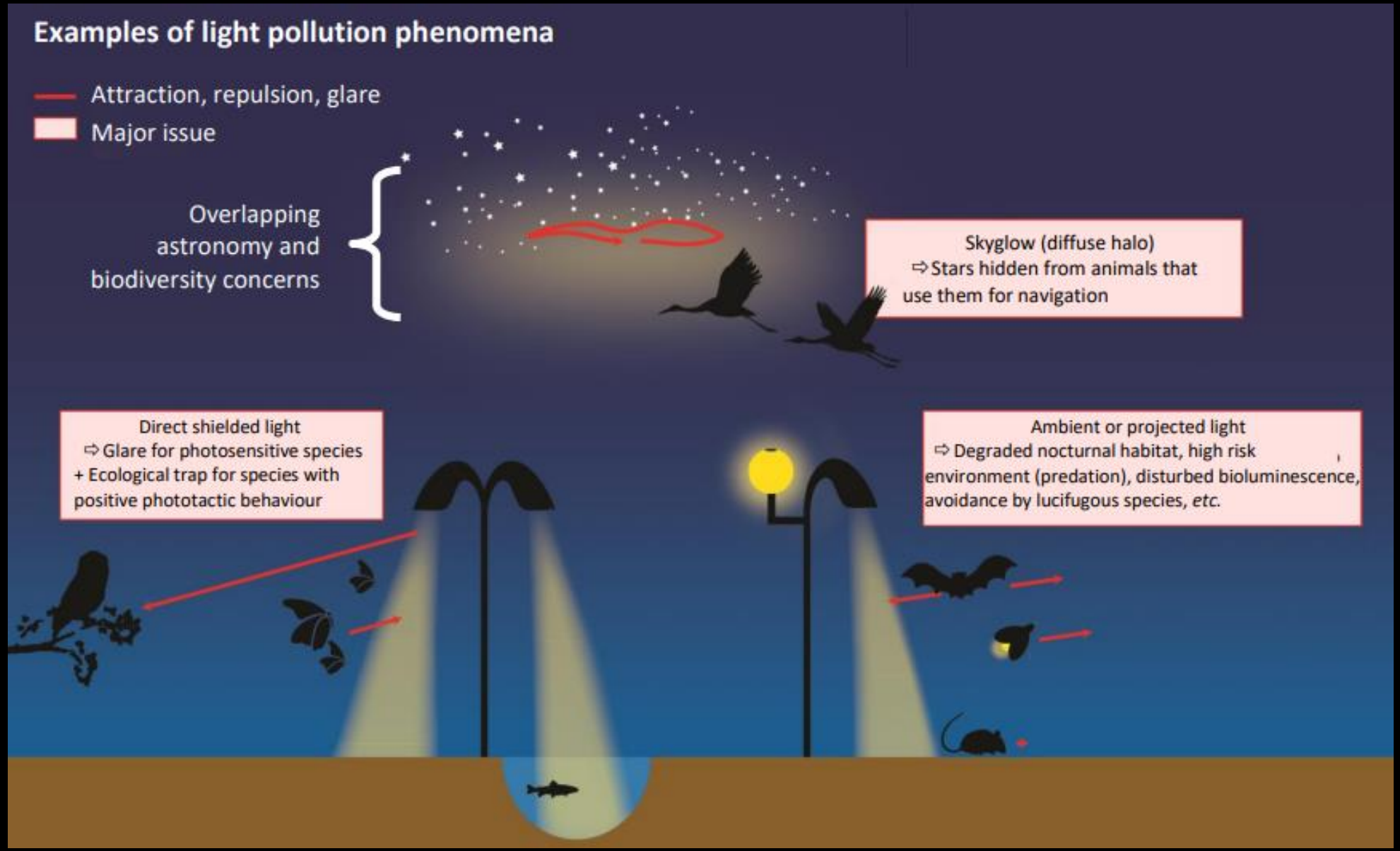


Sordello et al. (2022) A plea for a worldwide development of dark infrastructure for biodiversity – Practical examples and ways to go forward.

https://doi.org/10.1016/j.landurbplan.2021.104332

Romain Sordello, Fabien Paquier and Aurélien Daloz – September 2021, *Dark Infrastructure: an ecological network for night-time wildlife*

https://www.trameverteetbleue.fr/sites/default/files/references_bibliographiques/dark_infrastructure_an_ecological_network_september_2021.pdf



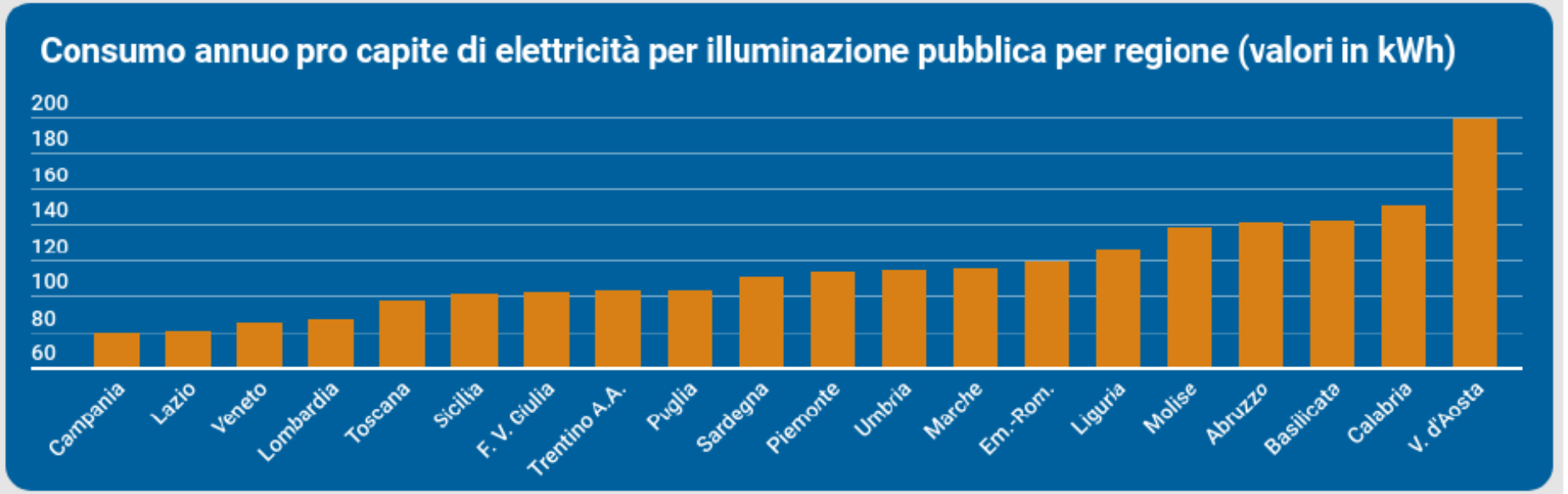
Romain Sordello, Fabien Paquier and Aurélien Daloz – September 2021, *Dark Infrastructure: an ecological network for night-time wildlife*

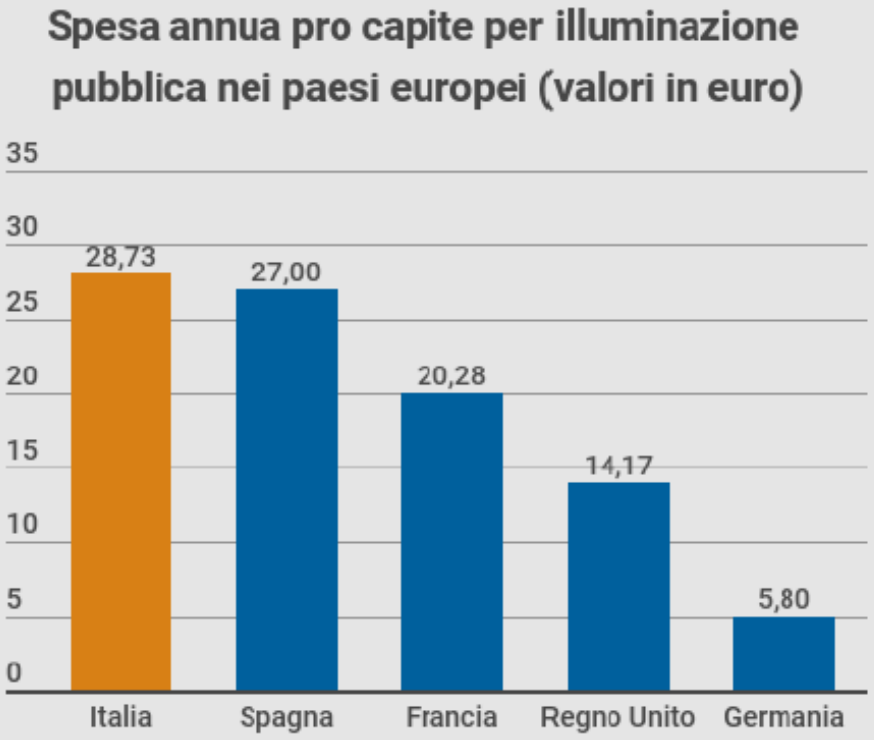
https://www.trameverteetbleue.fr/sites/default/files/references_bibliographiques/dark_infrastructure_an_ecological_network_september_2021.pdf

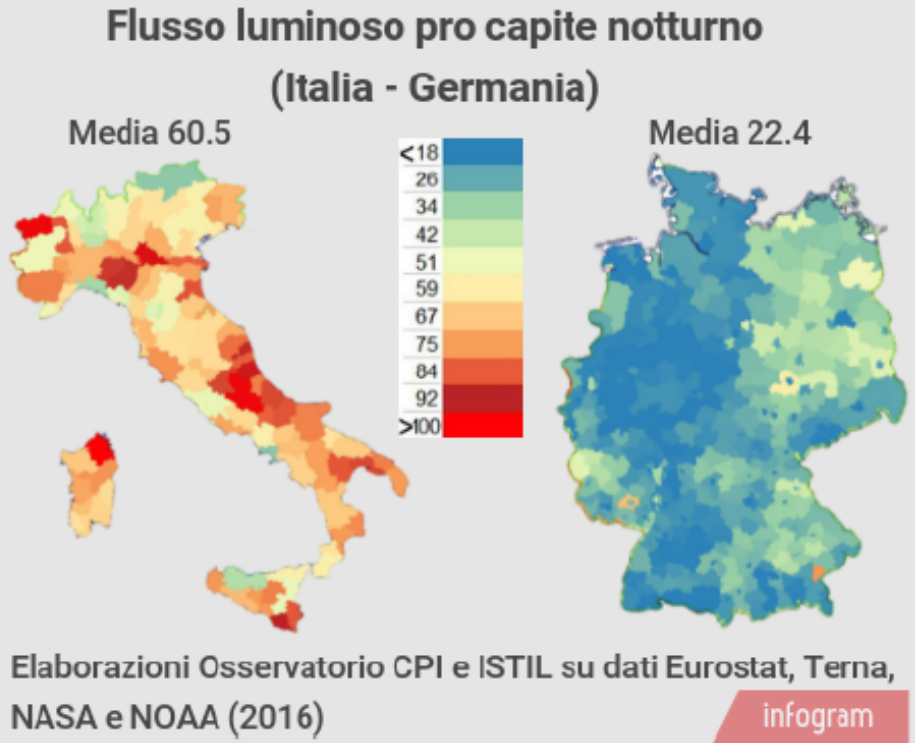
“O forse no.”

Dead birds collected in one year after colliding with lit windows in Toronto

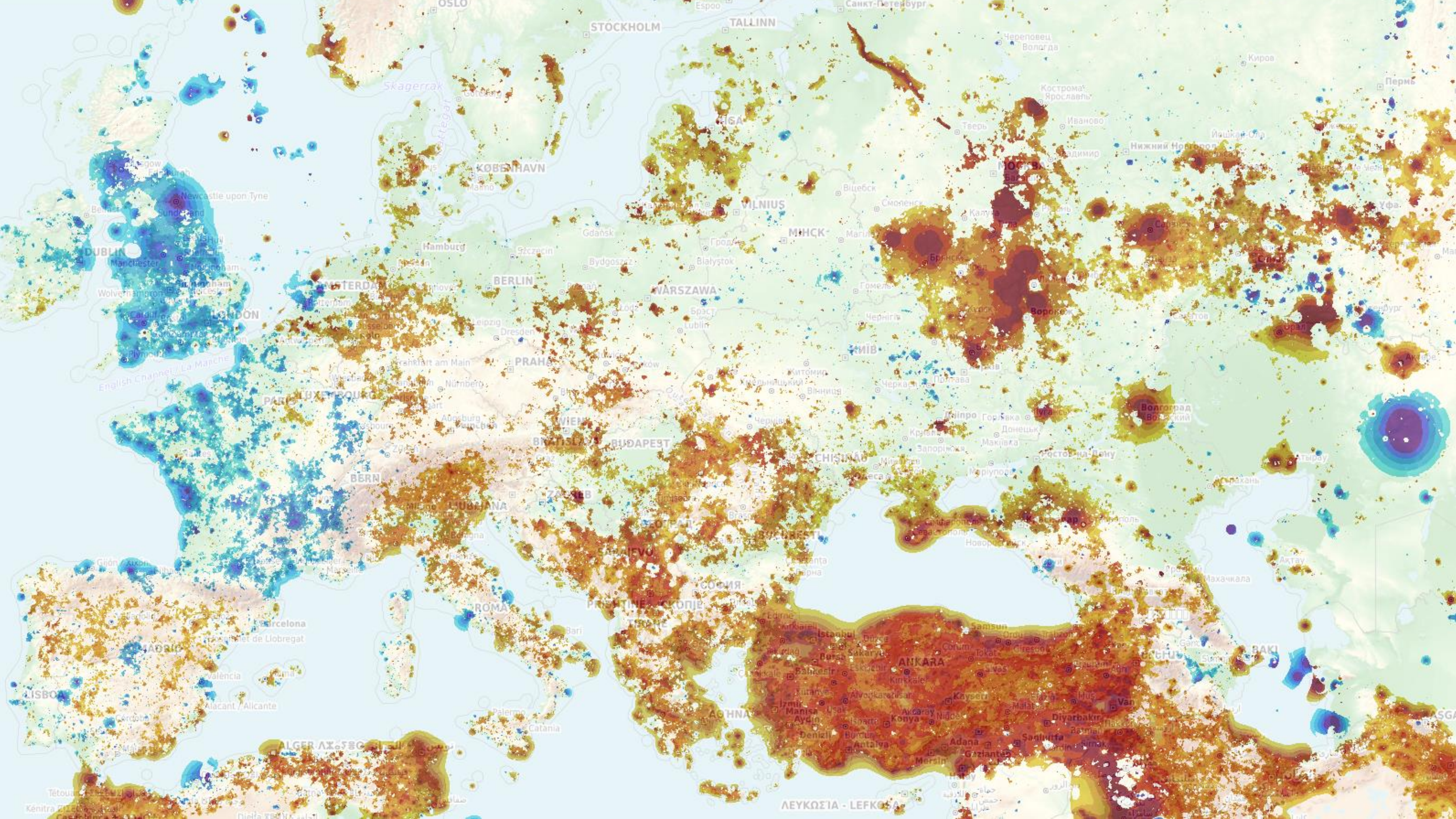
https://britastro.org/dark-skies/images/Fall%202002%20Nat%20Geographic.jpg







Fonte:
Cottarelli C. et al. (a cura di), *Illuminazione pubblica. Spendiamo troppo*, Osservatorio dei conti pubblici italiani, 21 maggio 2018



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Dresden
Leipzig
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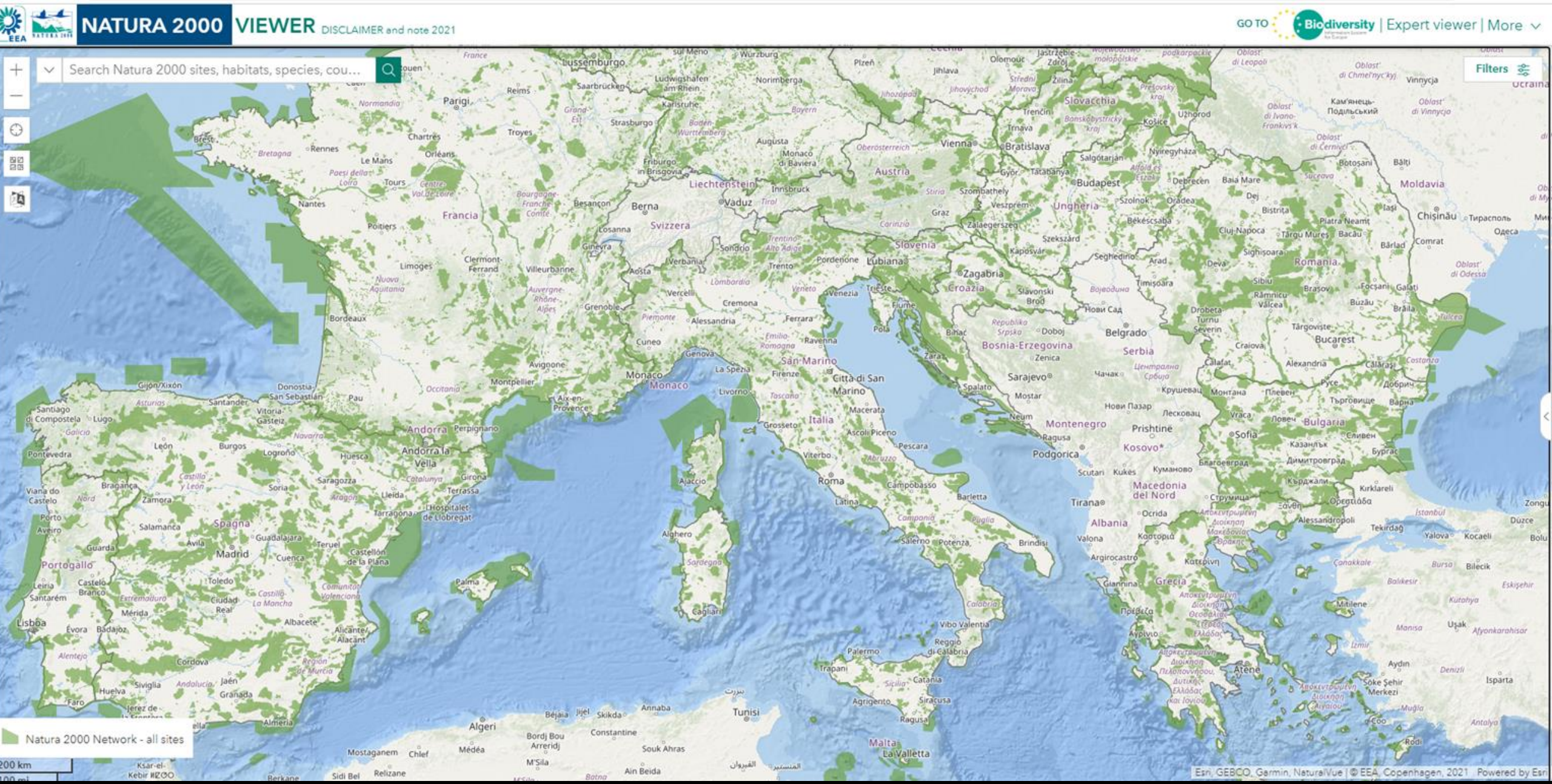
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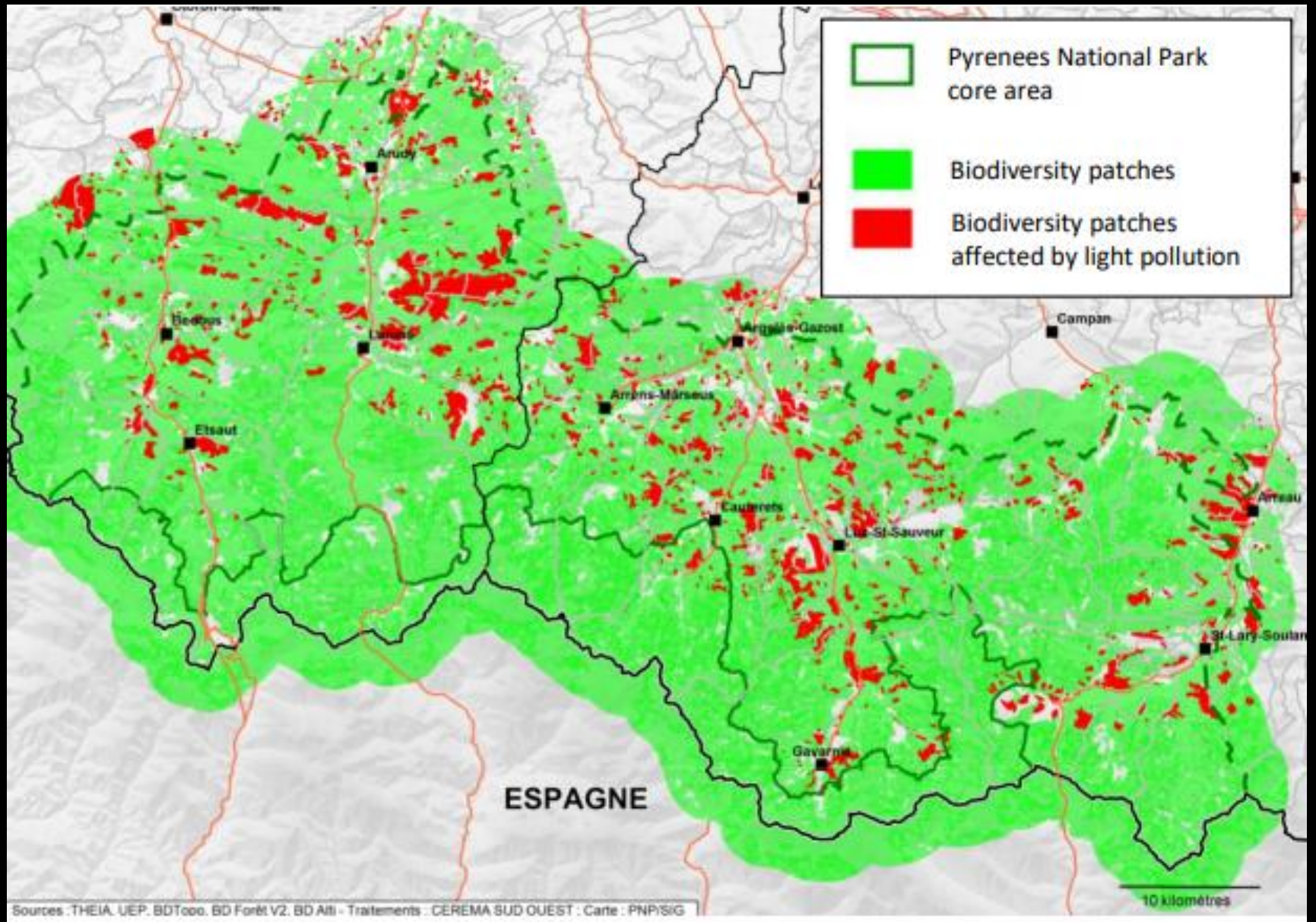


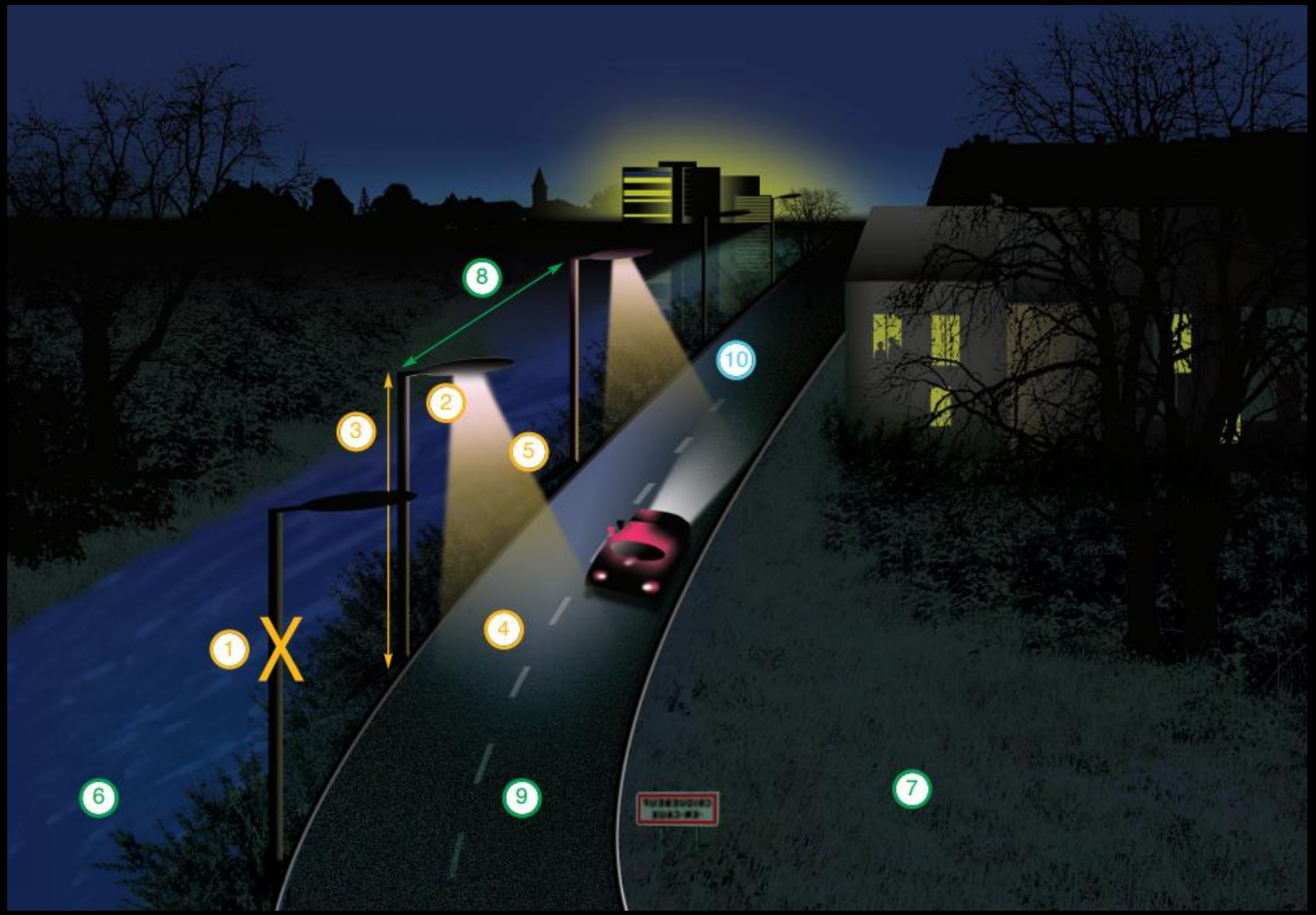
Figure 7: Biodiversity patches affected and unaffected by light pollution. Source: PNP.

Romain Sordello, Fabien Paquier and Aurélien Daloz – September 2021, *Dark Infrastructure: an ecological network for night-time wildlife*

https://www.trameverteetbleue.fr/sites/default/files/references_bibliographiques/dark_infrastructure_an_ecological_network_september_2021.pdf

Ritessere una trama nera:

1) Illuminare solo **ciò** che serve
2) Illuminare solo **quando** serve
3) Utilizzare **lampade efficienti** e con la **giusta intensità** (appropriata e non eccessiva)
4) Scegliere **luci calde**
5) **Schermare** le luci



Romain Sordello, Fabien Paquier and Aurélien Daloz – September 2021, *Dark Infrastructure: an ecological network for night-time wildlife*

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Les nouvelles **plages horaires** de l'arrêté 2018

Nouveauté

PARKINGS*

▼

Allumage :
au coucher
du soleil

—

Extinction :
2 h après
la fin de l'activité

—

Allumage :
7 h du matin ou 1 h avant
le début de l'activité

Nouveauté

PATRIMOINE

▼

Allumage :
au coucher du soleil

—

Extinction :
1 h du matin

—

Exception pour les parcs et jardins :
extinction 1 h après
la fermeture.

Les éléments de l'arrêté de 2013 restent en vigueur dans l'arrêté 2018

*Parkings : parcs de stationnements non couverts ou semi-couverts

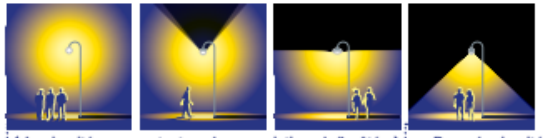
La mesure est

PRO-GRES-SIVE !

L'objectif n'est pas de changer l'ensemble des luminaires au 1er janvier 2020, mais bien de prendre en compte ces nouvelles réglementations en cas de renouvellement du parc de luminaires.

Les nouveautés **techniques**

1. IL EST DÉSORMAIS INTERDIT OU FORTEMENT DÉCONSEILLÉ DANS CERTAINS CAS D'ENVOYER DE LA LUMIÈRE VERS LE CIEL. Dans cette même logique, l'arrêté inscrit la notion de lumière intrusive. La lumière urbaine ne doit pas gêner les habitations privées.



← Luminosité ne respectant pas les prescriptions de l'arrêté → Bonne luminosité

Exemple un lampadaire en agglomération devra désormais éclairer vers le bas. S'il y a d'autres lampadaires à côté, l'ensemble de la lumière produite par ces luminaires ne devra pas dépasser une certaine densité surfacique de flux lumineux en agglomération. La réglementation impose une densité surfacique de 35 lumens par mètre carré, équivalent à une intensité lumineuse permettant de circuler dans la rue de nuit sans difficulté.

2. L'ARRÊTÉ FIXE ÉGALEMENT DES SEUILS DE TEMPÉRATURES DE COULEUR À RESPECTER : ils ne devront pas dépasser 3000 K (kelvin) sauf dans certaines zones protégées (parcs naturels, réserves, sites d'astronomie) où les contraintes sont plus élevées. La température de couleur dans les parcs naturels régionaux et les parcs naturels marins ne devra pas excéder 2 700 K en agglomération et 2 400 K hors agglomération. Pour les chantiers sur des sites d'astronomie, le seuil ne devra pas dépasser 3000 K.

Repère

La couleur de lumière est indiquée en Kelvin (K). Plus le nombre de degrés en Kelvin est bas, plus la couleur de lumière est chaude. Par exemple :

- 2700 K correspond à de la lumière blanche très chaude (environnements domestiques) ;
- 3000 K correspond à de la lumière blanche chaude (bureaux) ;
- 4500 K correspond à la lumière froide, comparable à la lumière du jour.

Flash	Lampes fluorescentes	Lever ou coucher de soleil	Ampoule domestique	Bougie
5000 K à 5500 K	4000 K à 5000 K	3000 K à 4000 K	2500 K à 3500 K	1000 K à 2000 K

Les **plages horaires** de l'arrêté 2013 toujours en vigueur

Éclairages (intérieurs ou extérieurs) des **BÂTIMENTS NON RÉSIDENTIELS** **
Allumage : 7 h du matin ou 1 h avant le début de l'activité
Extinction : 1 h après la fin de l'occupation des locaux

Extinction des **FAÇADES** des bâtiments à 1 heure du matin au plus tard

Allumage des éclairages des **VITRINES DE MAGASINS** à partir de 7 h ou 1 h avant le début de l'activité.
Extinction à 1 h du matin ou 1 h après la fin de l'occupation des locaux

** Bâtiments non résidentiels : bâtiments accueillant des activités diverses non résidentielles, éclairant vers l'extérieur. Sont également concernées les illuminations de ces bâtiments.

Glossary

Chronotone: boundary between day and night, just as the "ecotone" is the boundary area between two ecosystems in space. It is possible that the biological activity of certain nocturnal species may peak during these transition periods.
Colour temperature (in K): indicates the proportion of blue and red in the light spectrum. The warmer the light (high proportion of red), the lower the colour temperature and vice versa. It is expressed in Kelvin (K).
Dark Infrastructure: a series of interconnected biodiversity patches and ecological corridors for different environments identified as being sufficiently dark for nocturnal biodiversity.
Ecological network: an area particularly favourable for biodiversity and for wildlife movements across a given territory, consisting of habitat patches (cores) of high biodiversity value and ecological corridors connecting them.
Green and Blue Infrastructure / *Trame verte et bleue*: a public policy designed to mitigate the fragmentation of natural habitats. It aims to ensure that better account be taken of biodiversity in land-use planning through ecological networks.
Illuminance (in lux): luminous flux relative to a surface area, usually the surface receiving the light.
Luminous flux (in Lumen – lm): amount of light emitted by a light source in all directions in one second (i.e. the sum of the luminous intensities).
Melatonin: primarily known as the central hormone regulating chronobiological rhythms. The secretion of melatonin increases shortly after nightfall. It participates in controlling circadian rhythms and in regulating the day-night cycle.
Phototaxis: phenomenon through which animals and plants control their movement (attraction or repulsion) as a function of light in their environment.
Spectral composition of light: proportion of different wavelengths in emitted light. A light source with wavelengths spread across the entire spectrum visible to the human eye will produce white light, while conversely coloured light will be produced if the wavelengths are close or if certain wavelengths are absent.

Authors

Summary of the following publication:
Sordello R., Paquier F. and Daloz A. 2021. Trame noire, méthodologie d'élaboration et outils pour sa mise en œuvre. Office français de la biodiversité. Collection Comprendre pour agir. *112 pages*
https://bit.ly/2Quy7nv

English translation: Sally Ferguson, Jane Rollet for COMBAVA GIE

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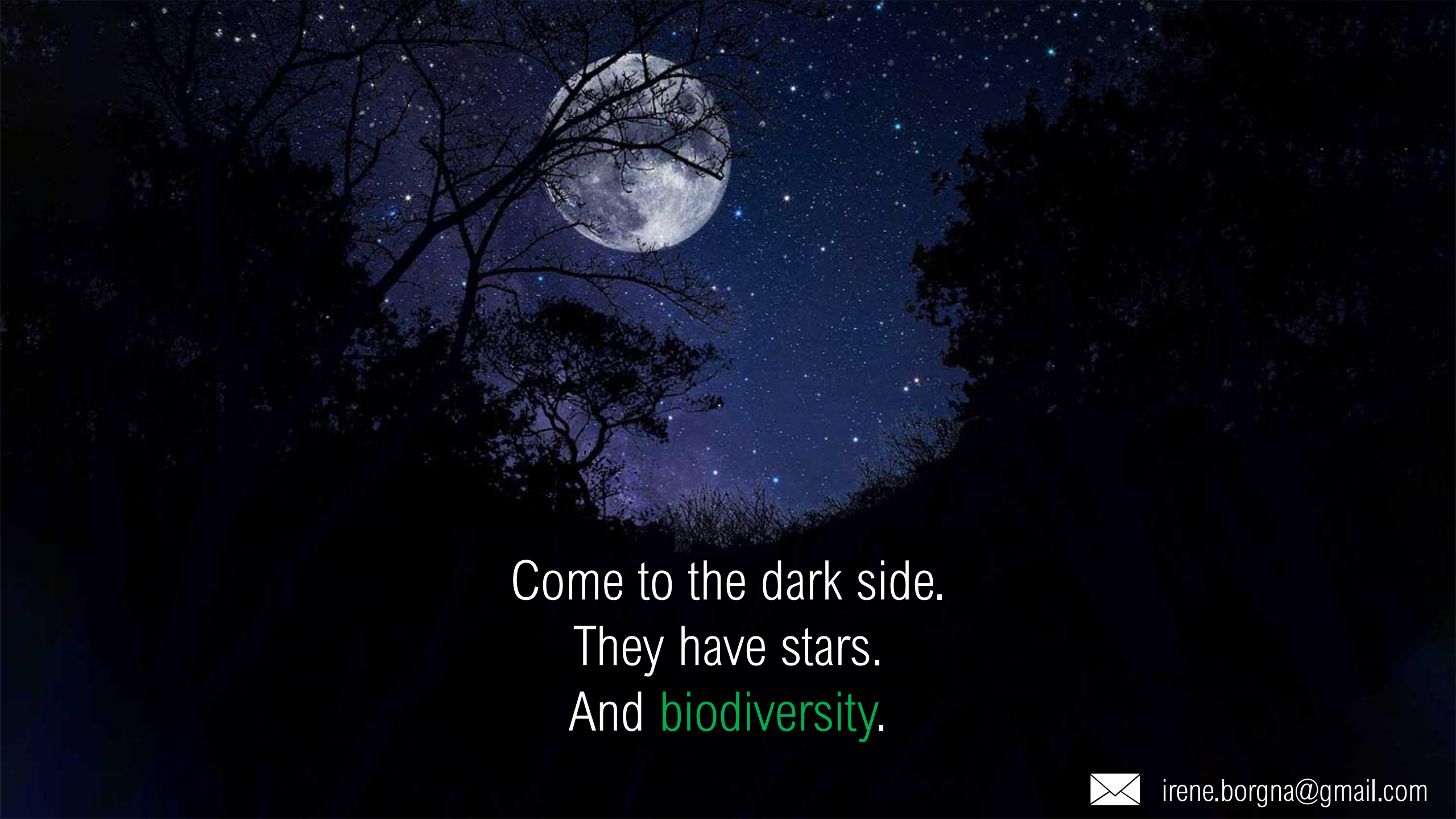

Come to the dark side.
They have stars.
And biodiversity.

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