19th International Geography Olympiad

Bandung, Indonesia

8–14 August 2023

WRITTEN RESPONSE TEST

Resource Booklet

Do NOT open the Booklet before instructed to do so by a supervisor.

Do NOT write any of your answers in this Booklet.

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Section A: The Aral Sea

- Large scale water diversion projects coupled with drought and high evaporation rates have caused a regional ecological, economic, and health disaster since 1961.
- For over 50 years, rivers feeding the Aral Sea have been diverted to irrigate cotton and rice fields.
- The main body of the sea has lost more than 90 percent of its volume.
- Dust storms from remaining salt flats now contaminate the region.

Box A1: Historical information regarding the Aral Sea region
(https://eros.usgs.gov/media-gallery/earthshot/aral-sea-kazakhstan-and-uzbekistan)

Figure A1: Central Asia with the location of the Aral Sea
(https://www.nationsonline.org/oneworld/map/central-asia-map.htm)

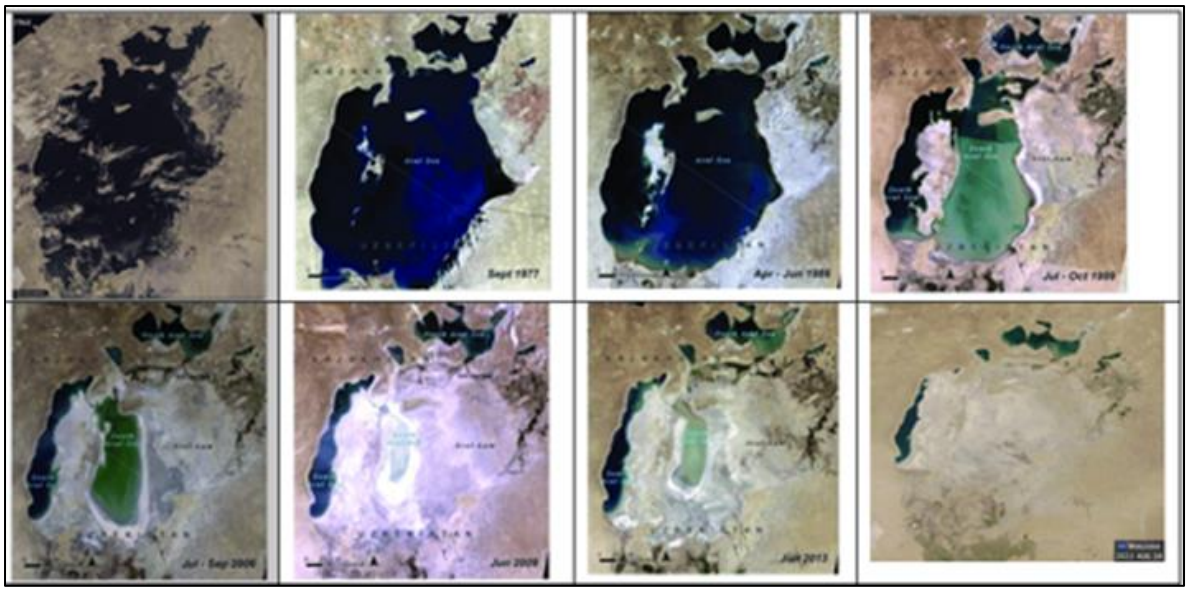


Figure A2: Landsat satellite imagery showing changes of the Aral Sea (1964-2022)
(https://i.redd.it/former-aral-sea-1964-vs-2022-v0-vyfplv5g3x0a1.jpg?s=92123657c8d8e13f3fa70da989e8b5bd29b3ea75, https://na.unep.net/geas/articleimages/Jan-14-figure-2.png)

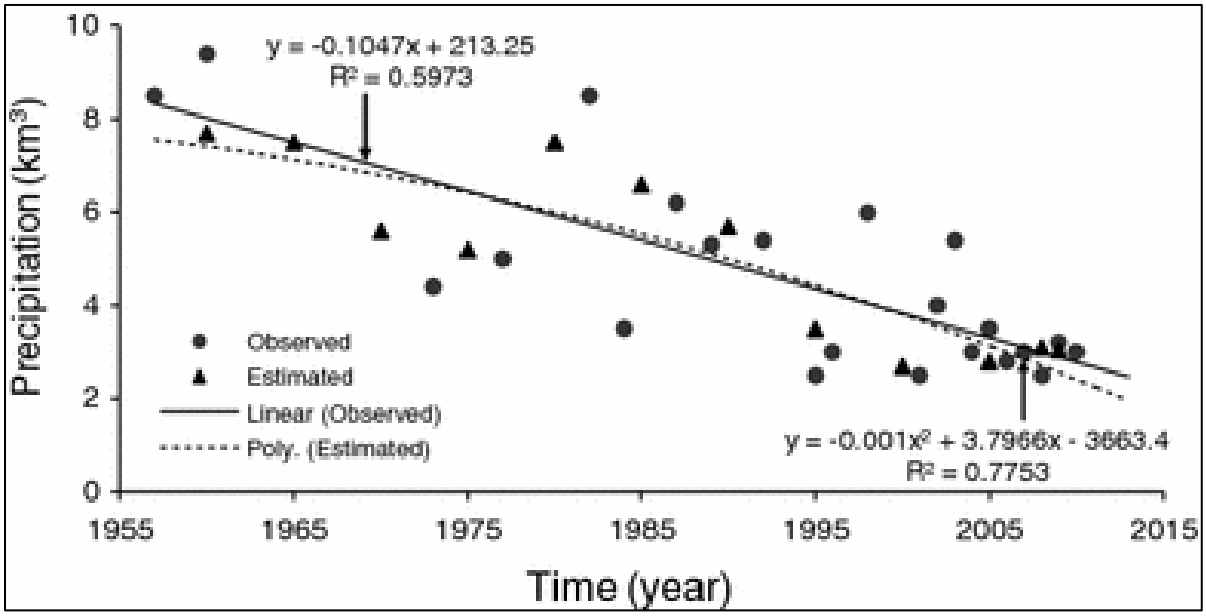


Figure A3: Changes in Precipitation of the Aral Sea 1955-2015
(https://doi.org/10.1007/s13201-012-0048-z)

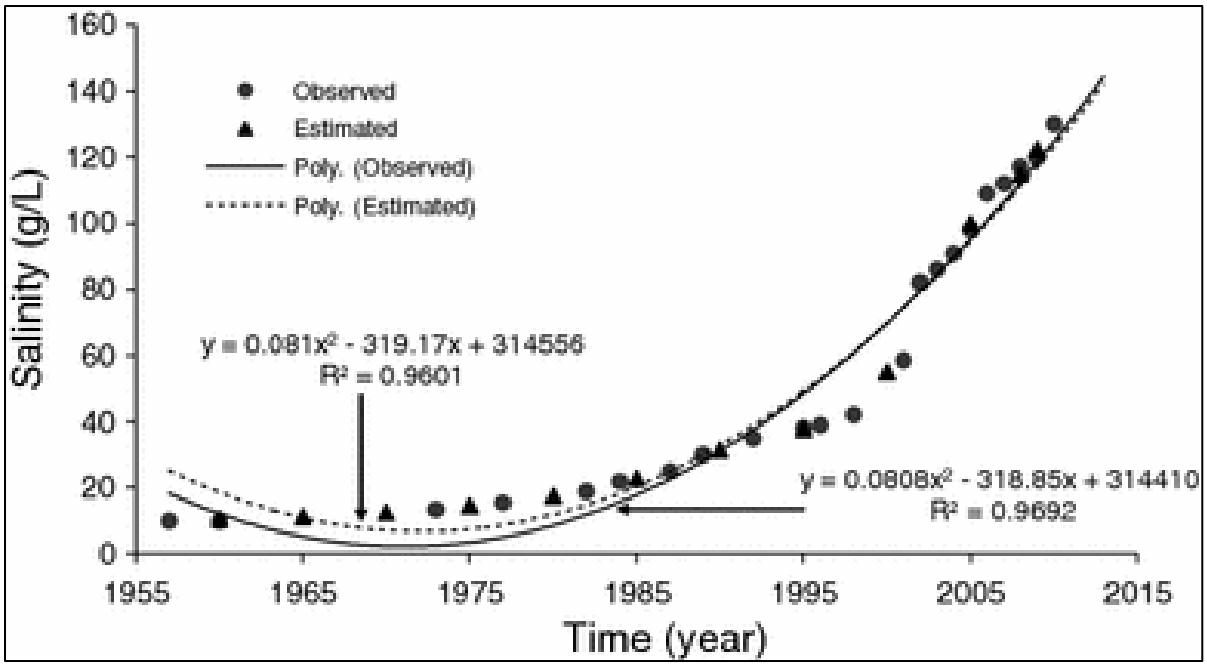


Figure A4: Changes in Salinity of the Aral Sea 1955-2015
(https://doi.org/10.1007/s13201-012-0048-z)

Section B: Maritime transport

Table B1. United Nations Conference on Trade and Development (UNCTAD) port liner shipping connectivity index (PLSCI)* in the first quarter (Q1) of 2006 and fourth quarter (Q4) of 2022 in 50 busiest container ports in the world

(https://unctadstat.unctad.org/EN/)

No	Port	Index (PLSCI)		No	Port	Index (PLSCI)	
		Q1 2006	Q4 2022			Q1 2006	Q4 2022
1	Shanghai	80.4	147.7	26	Le Havre	45.0	64.2
2	Ningbo	55.0	133.8	27	Dalian	38.6	63.9
3	Singapore	96.6	127.9	28	Kwangyang	31.9	61.9
4	Pusan	77.9	124.3	29	Piraeus	28.8	61.3
5	Qingdao	48.1	104.7	30	Bremerhaven	47.6	60.0
6	Rotterdam	76.4	94.9	31	Port Said	39.4	59.7
7	Hong Kong	100.0	92.8	32	Khalifa	n.d.	57.8
8	Port Klang	60.2	92.5	33	Gioia Tauro	28.8	57.5
9	Antwerp	74.7	90.7	34	New York/New Jersey	34.9	56.3
10	Shekou	36.3	90.7	35	Taipei	n.d.	55.9
11	Kaohsiung	59.8	85.9	36	Felixstowe	44.0	55.5
12	Xiamen	42.7	85.5	37	Jakarta	31.5	55.0
13	Yantian	46.4	84.2	38	Ambarli	14.0	54.9
14	Nansha	16.1	84.1	39	Sines	10.8	54.6
15	Hamburg	73.4	78.3	40	Mundra	15.6	54.0
16	Jebel Ali	37.4	77.6	41	Kobe	51.1	53.5
17	Laem Chabang	33.9	76.1	42	Vung Tau	n.d.	53.4
18	Colombo	33.5	73.9	43	Jeddah	36.8	53.3
19	Tanjung Pelepas	33.0	72.4	44	London Gateway	n.d.	52.8
20	Xingang	39.2	70.5	45	Nhava Sheva	33.3	52.8
21	Valencia	41.9	70.4	46	King Abdullah	n.d.	52.7
22	Tanger Med	n.d.	69.2	47	Haiphong	10.4	52.5
23	Yokohama	55.9	69.9	48	Zeebrugge	27.7	52.4
24	Algeciras	30.1	68.5	49	Savannah	31.9	52.2
25	Barcelona	37.3	66.8	50	Tokyo	43.9	51.2

**Port liner shipping connectivity index* (PLSCI) is a measure of connectivity to maritime shipping and a measure of trade facilitation in container ports and countries. A port with a higher connectivity is assigned a higher value.

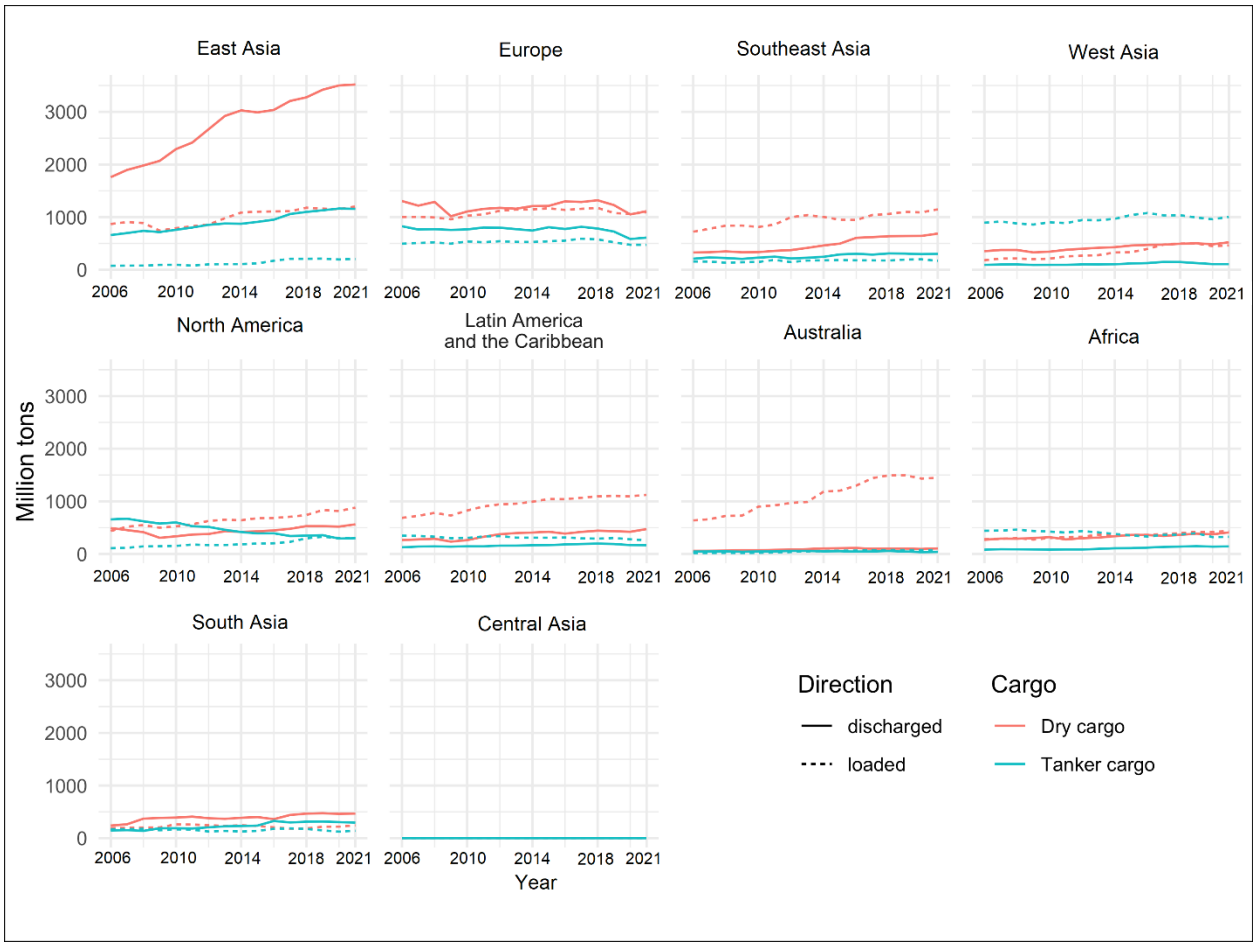


Figure B1. Maritime trade by basic type of cargo by world regions 2006-2021 (tanker cargo – oil, liquid fuels, chemicals; dry cargo – all other cargo)
(https://unctadstat.unctad.org/EN/ (elaborated))

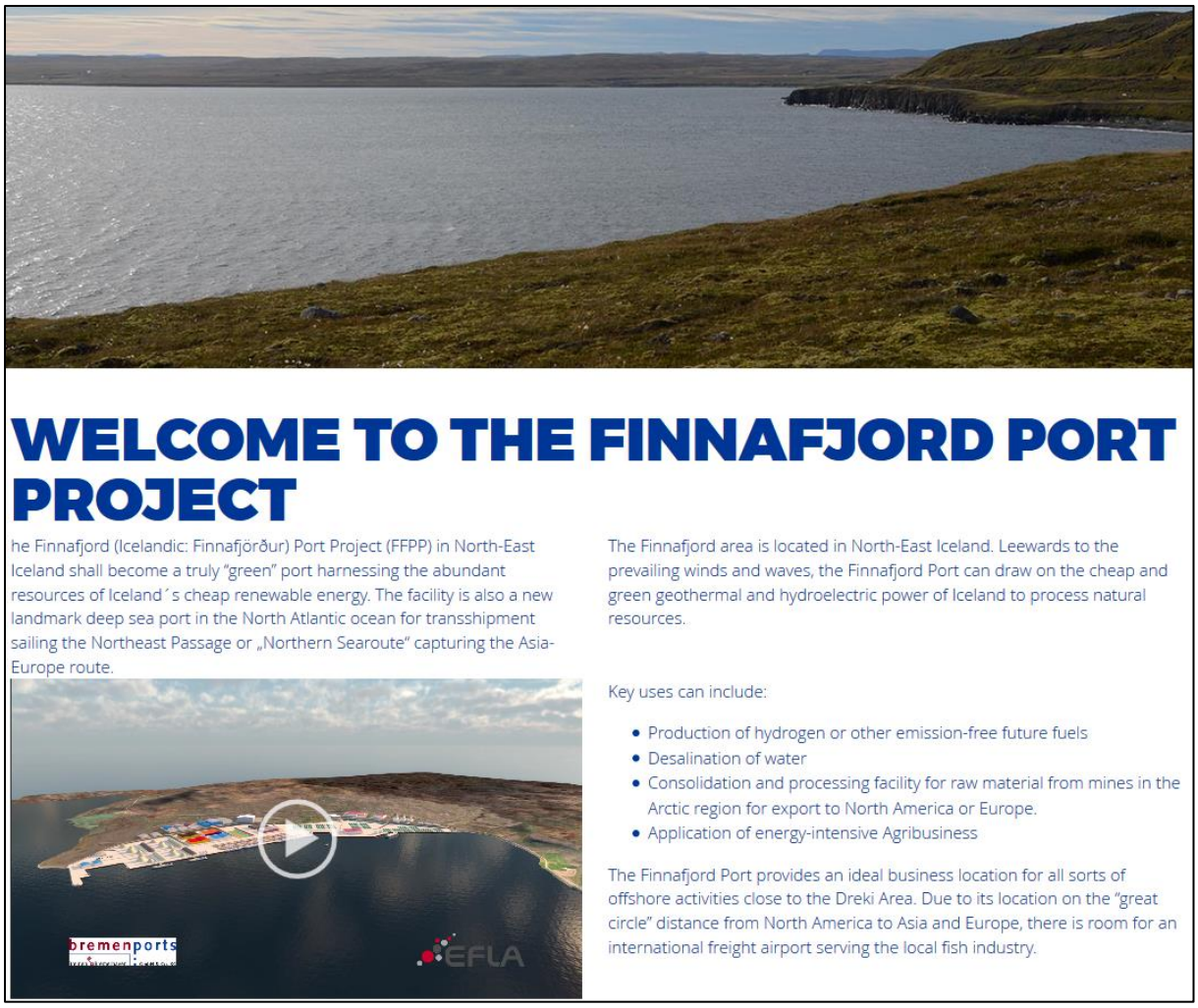
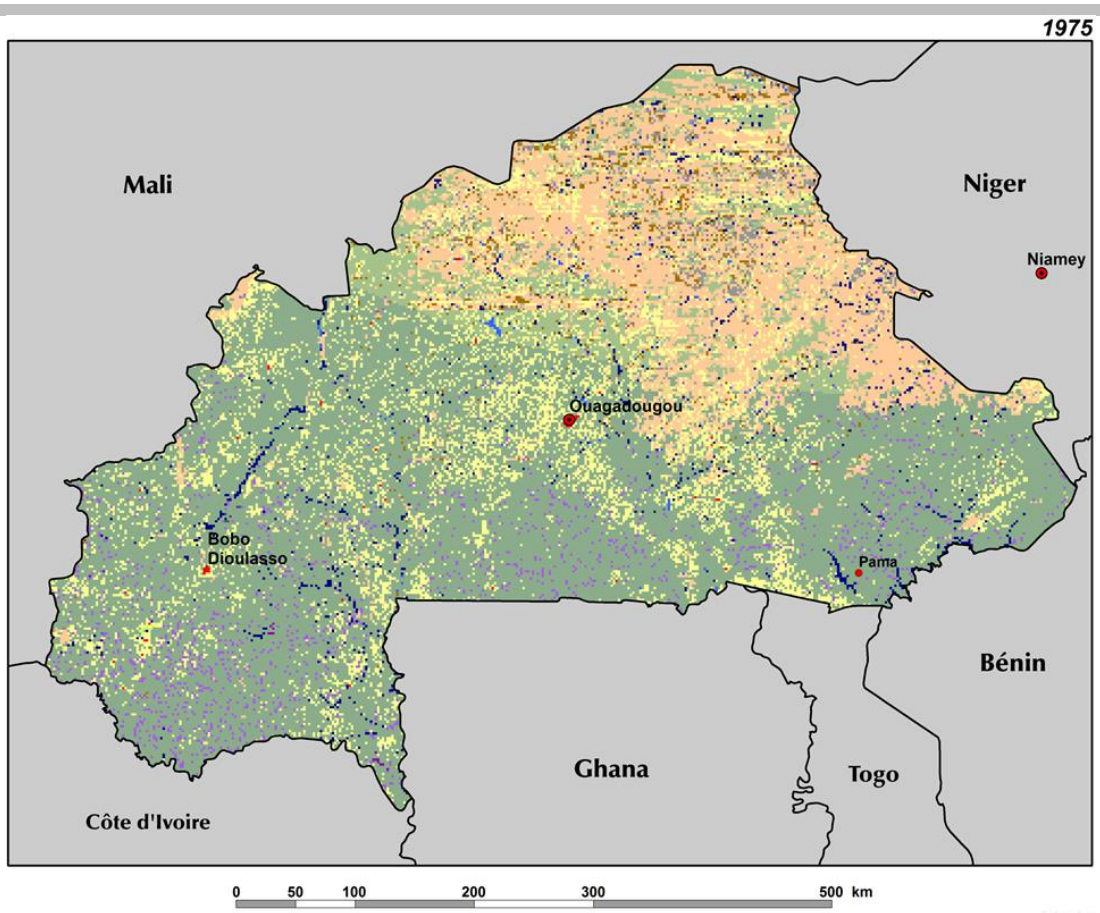
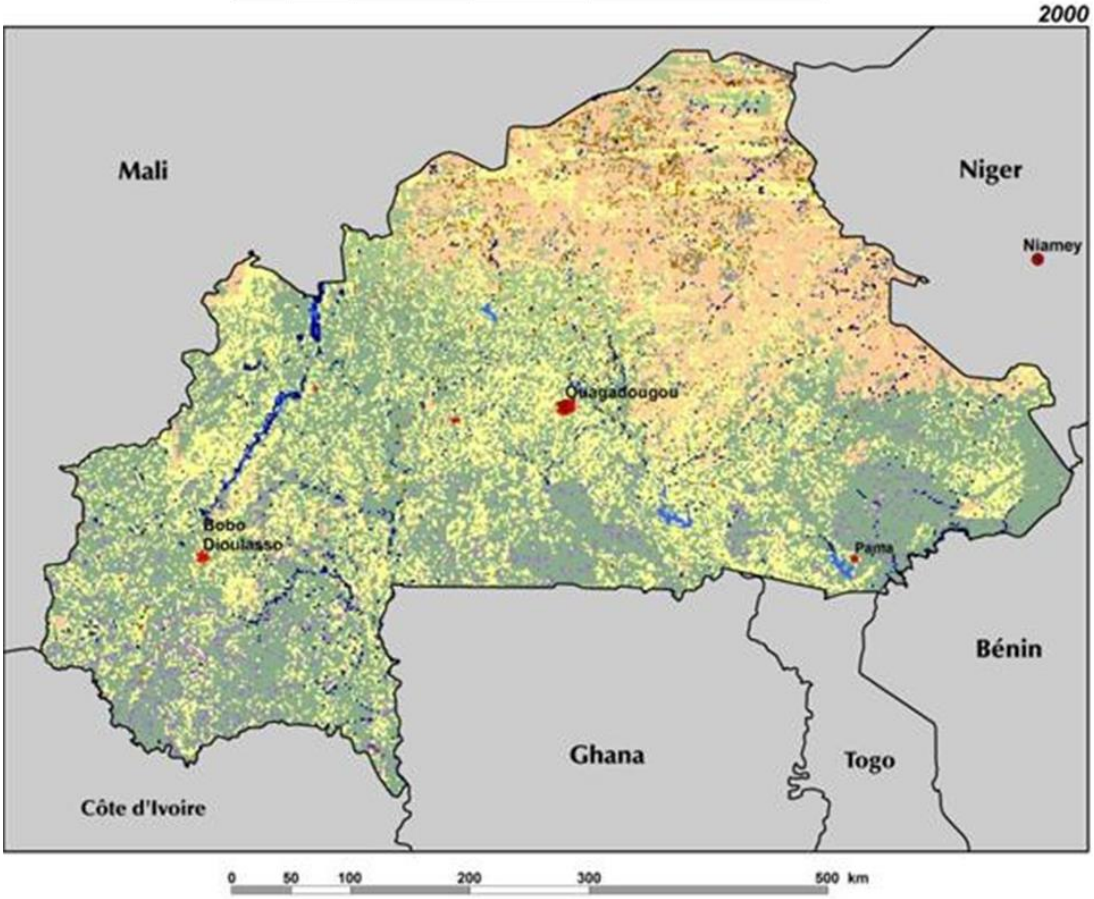


Figure B2. Finnafjord Port Project in Iceland
(https://bremen-ports.de/finnafjord/)

Section C: Land use and land cover change in Burkina Faso





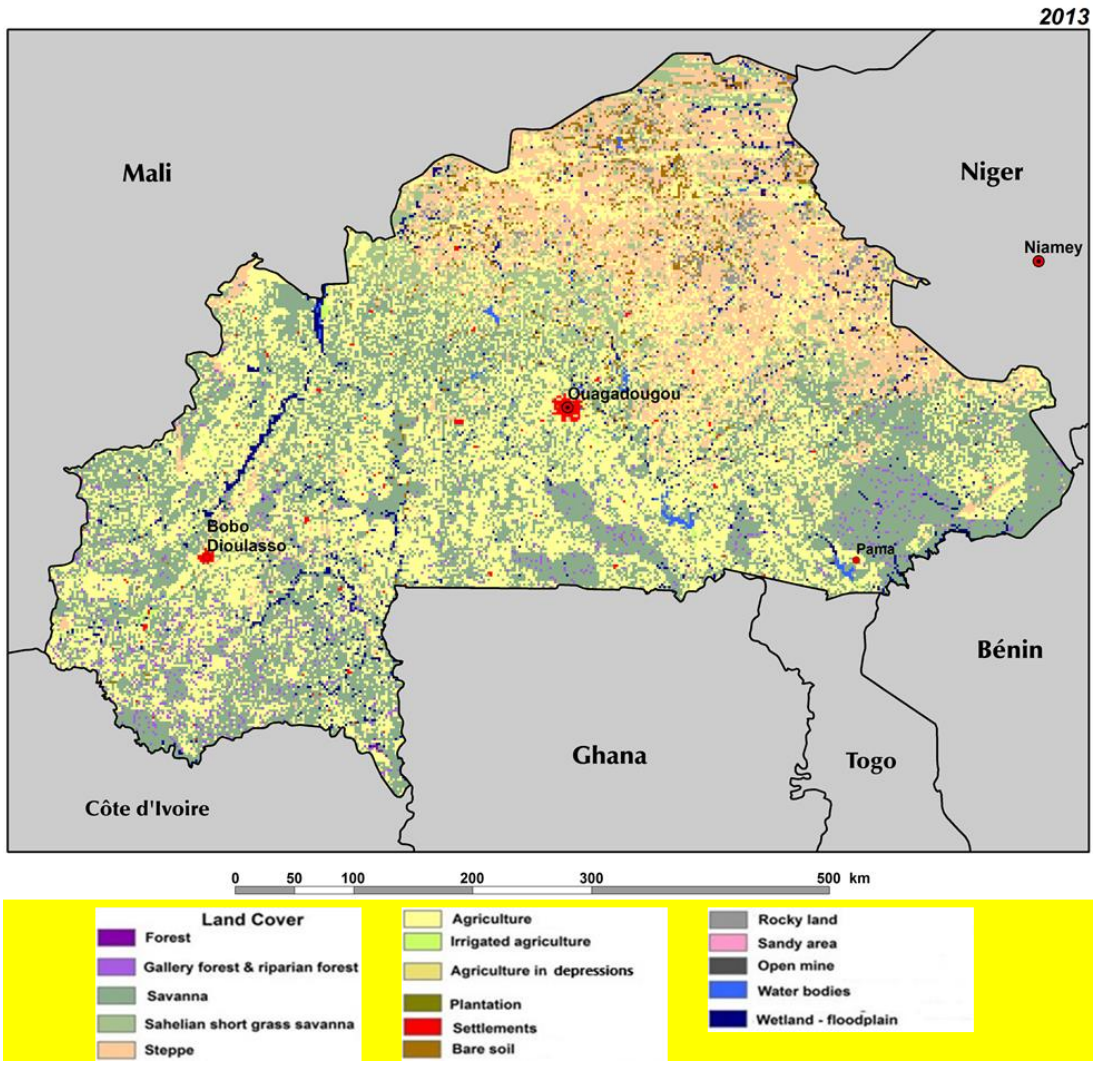


Figure C1. Land cover change in Burkina Faso in 1975, 2000 and 2013
(https://www.researchgate.net/figure/Land-Use-and-Land-Cover-classification-for-the-years-1975-2000-and-2013_fig3_350995189)

Section D: Innovative and sustainable cities

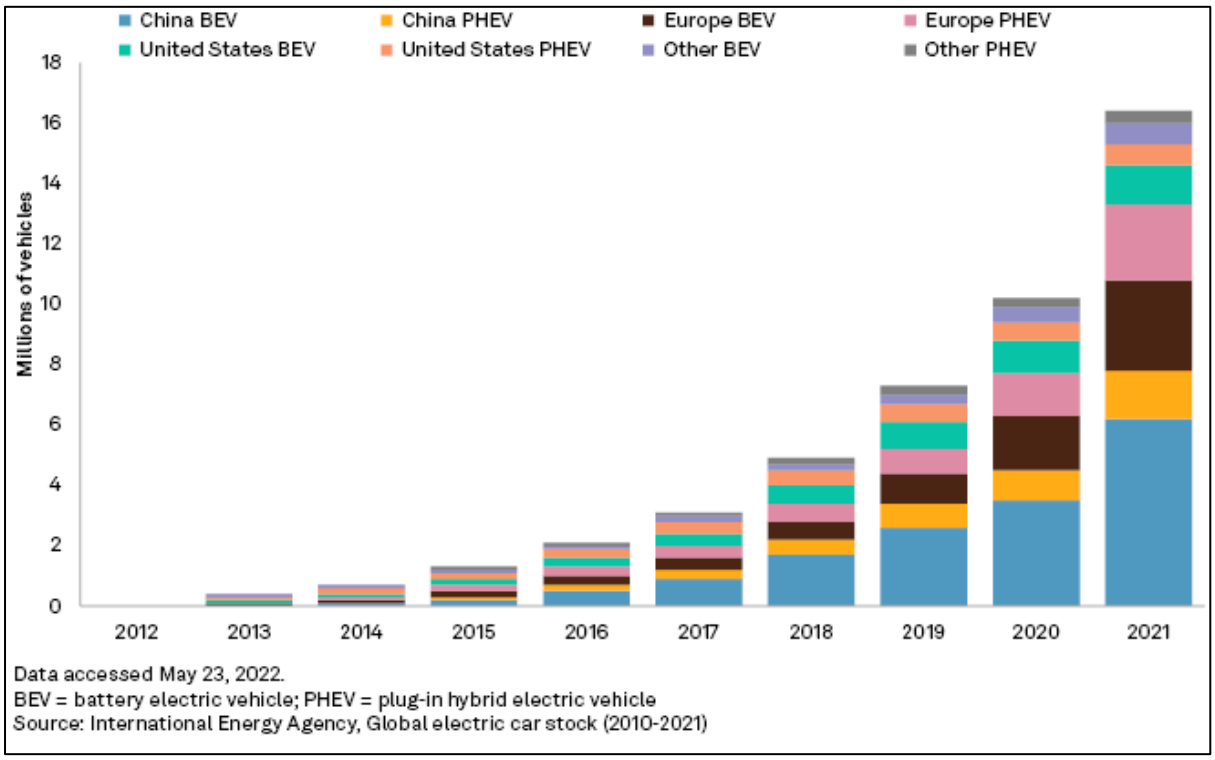


Figure D1. Number of battery and plug-in hybrid electric vehicles in the world 2012-2021

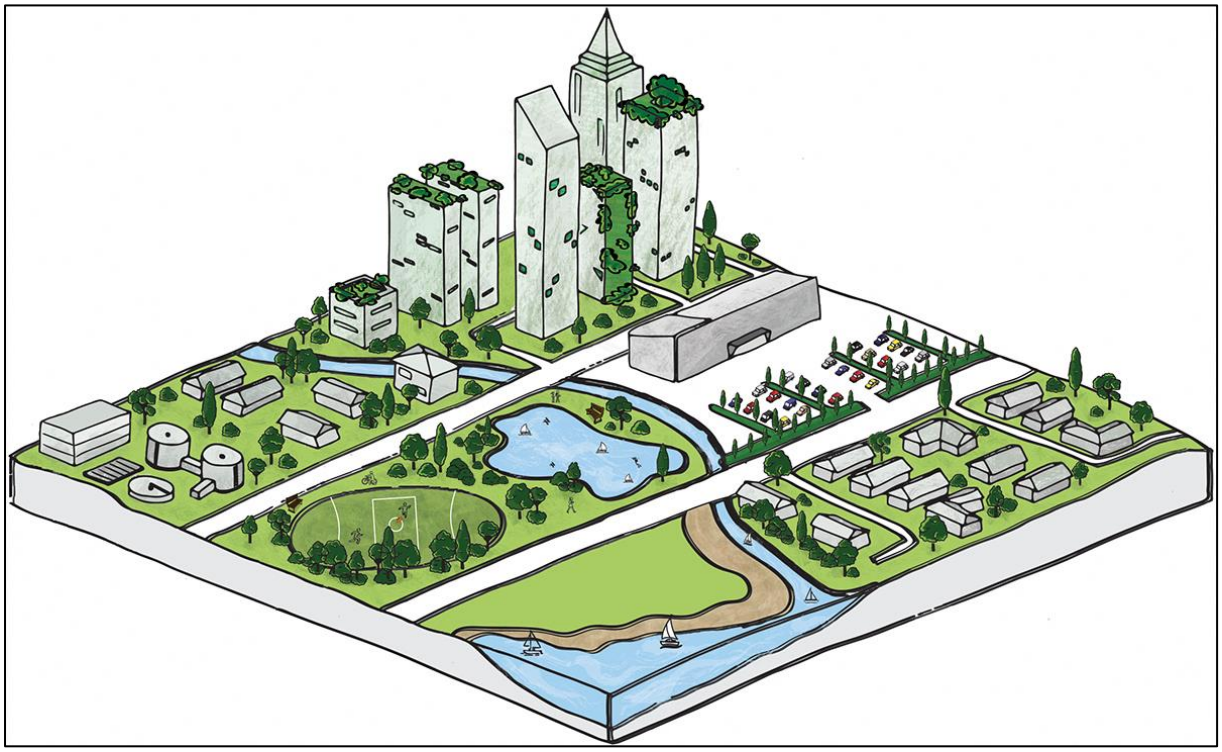


Figure D2. A model of design of a water-sensitive urban city
(https://watersensitivecities.org.au/solutions/case-studies/)

Section E: Shorelines

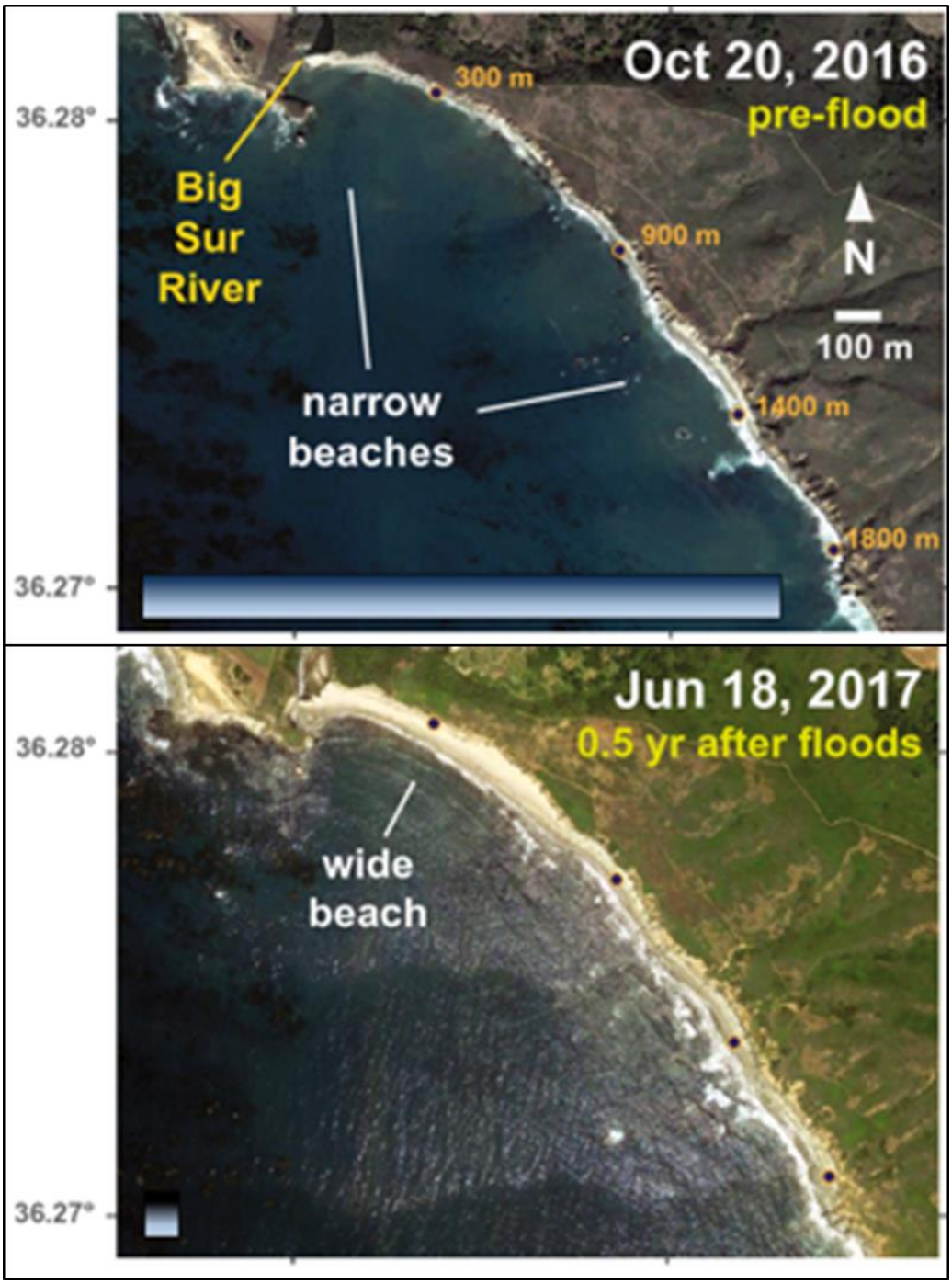


Figure E1. Big Sur River mouth and adjacent beaches before and after the 2016–2017 fire–flood events. The approximate location of the widest beach is highlighted by text in each image.

(https://www.researchgate.net/figure/Imagery-of-the-Big-Sur-River-mouth-and-adjacent-beaches-a-before-and-b-d-after-the_fig4_359121165)

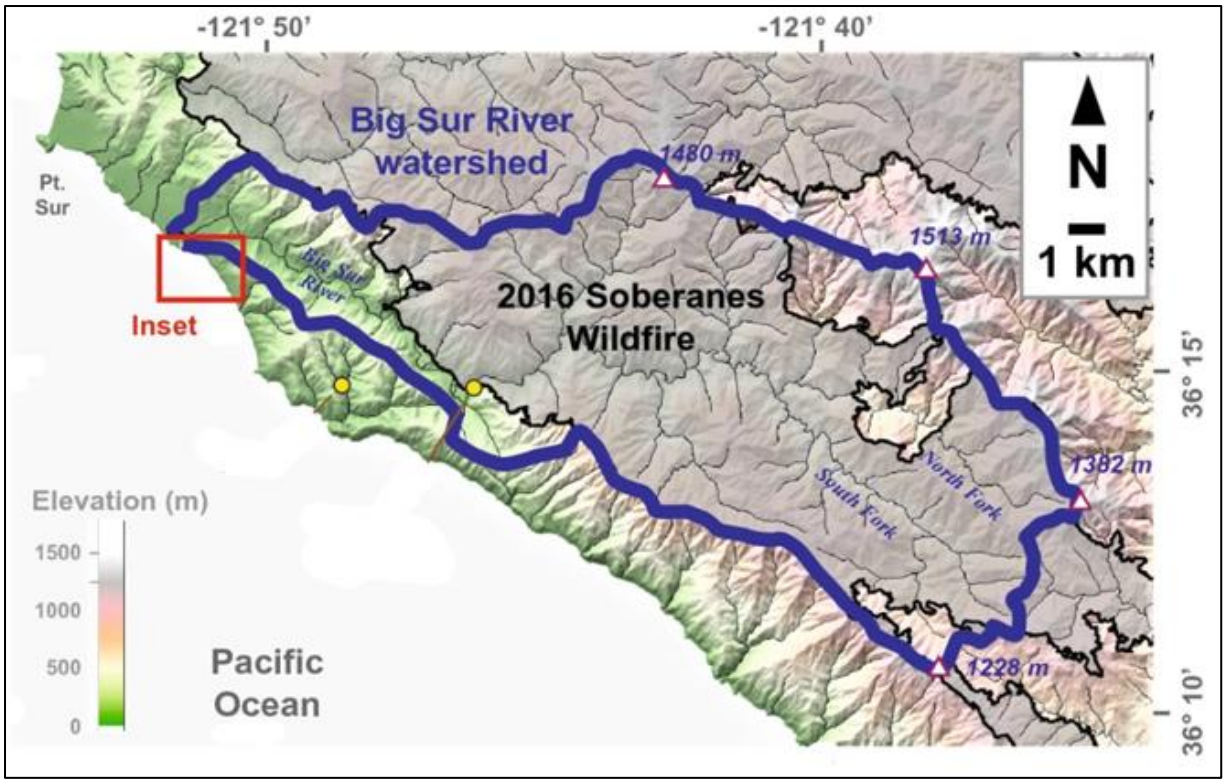


Figure E2. Big Sur River watershed, including the boundaries of the 2016 Soberanes wildfire. "Inset" in the figure shows the location of the images in Figure 1.
(https://www.researchgate.net/figure/Imagery-of-the-Big-Sur-River-mouth-and-adjacent-beaches-a-before-and-b-d-after-the_fig4_359121165)

Figure E3. Oblique aerial photo of the Big Sur River mouth and a coastal feature
(https://www.researchgate.net/figure/Imagery-of-the-Big-Sur-River-mouth-and-adjacent-beaches-a-before-and-b-d-after-the_fig4_359121165)

Section F: Ski tourism

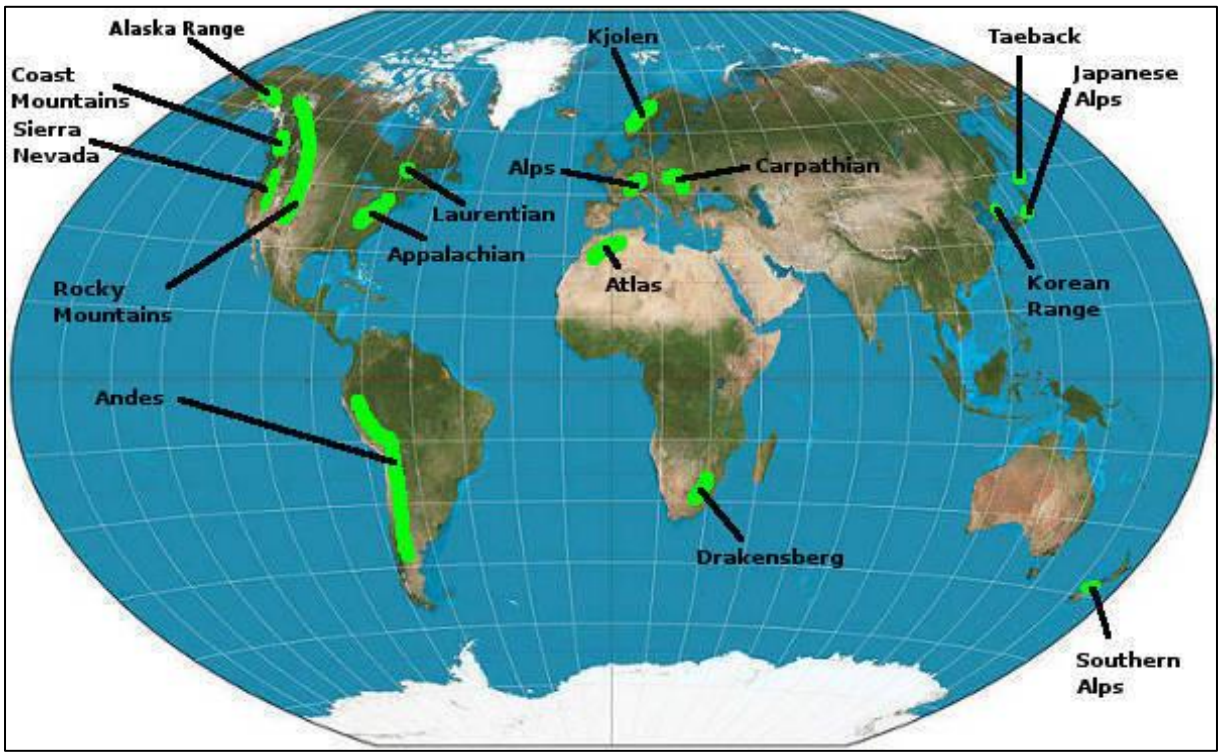


Figure F1. Mountain ranges in the world with developed ski tourism (http://www.mountainyahoos.com/SkiResorts/)

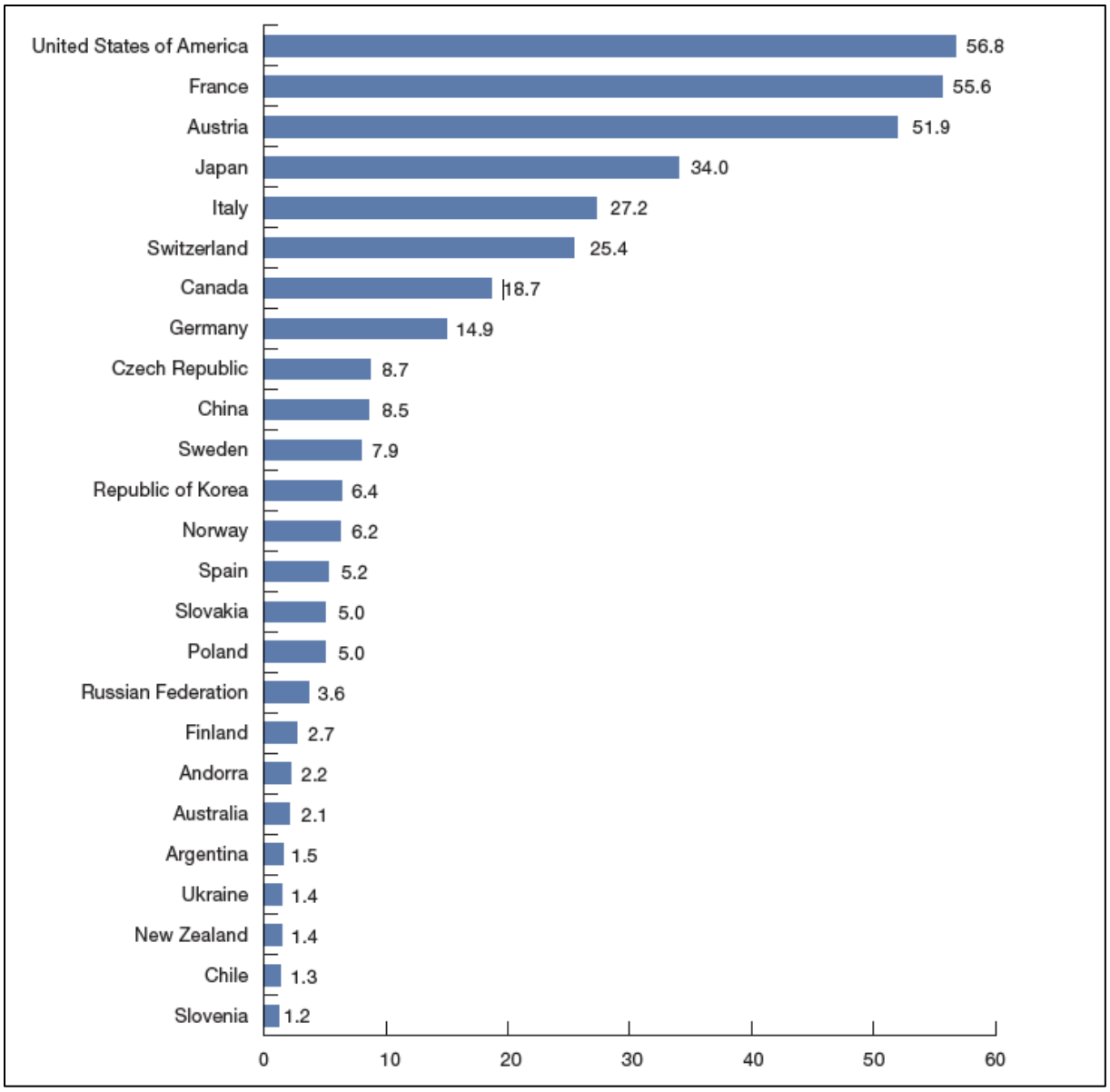


Figure F2. Average annual skier visits 2010-2014 (in million)
(https://www.e-unwto.org/doi/epdf/10.18111/9789284420261.1)

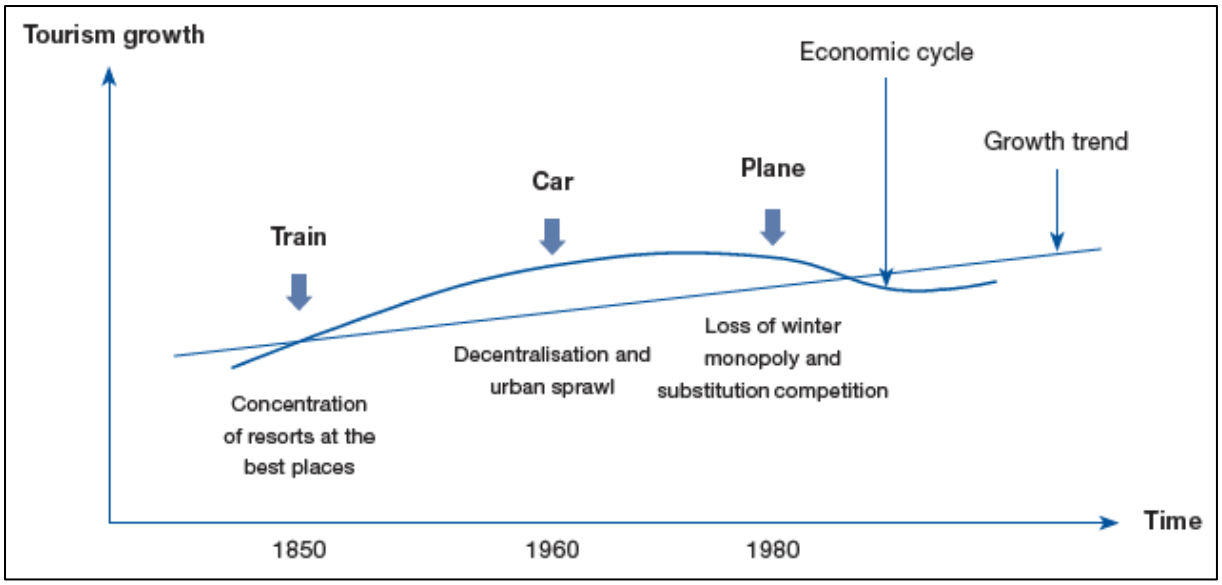


Figure F3. Influence of innovation in transport on mountain tourism growth
(https://www.e-unwto.org/doi/epdf/10.18111/9789284420261.1)

Figure F4. Examples of spatial transformation associated with ski tourism
(https://unofficialnetworks.com/2013/04/09/insane-wingsuit-flight-aiguille-du-midi-bridge/,
https://www.researchgate.net/publication/311788786_Zum_Management_der_Biodiversitat_von_Tourismus-und_Wintersportgebieten_in_einer_Ara_des_globalen_Wandels)

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