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Press Release

by the Regional Eastern Europe Fire Monitoring Center (REEFMC)
Regarding the Wildfires in and near the Chernobyl Exclusion Zone (CEZ) – 29.03 – 22.04 2020

Last update: 22 April 2020

Prepared by Sergiy Zibtsev and Victor Myroniuk

Published on the websites of

REEFMC: <https://nubip.edu.ua/en/reefmc>

GFMC: https://gfmc.online/globalnetworks/seeurope/SEurope_1_radio.html

Latest information on wildfires in the Chernobyl Exclusion Zone 29.03.20 – 22.04.20

By the 22 April 2020, on the 24th day of continuing fire suppression operations, spots of fires continue to burn northern part of the Chernobyl Exclusion Zone and eastern part of Zhytomyr oblast along border with Belarus with almost absent accessibility for ground fire brigades. There are two cases of crossing by fires Ukrainian-Belorussian border toward Poleskiy State Radioecological Reserve, but due to absent of roads it is impossible to respond except aviation suppression while aviation use in 10-km zone along border is restricted.

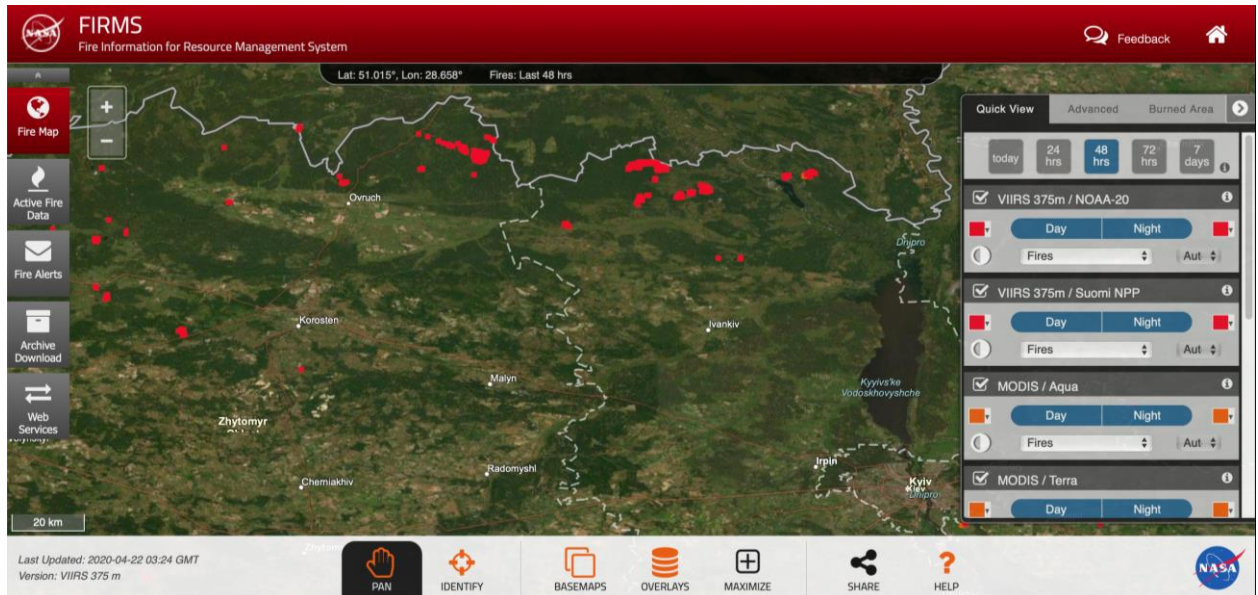
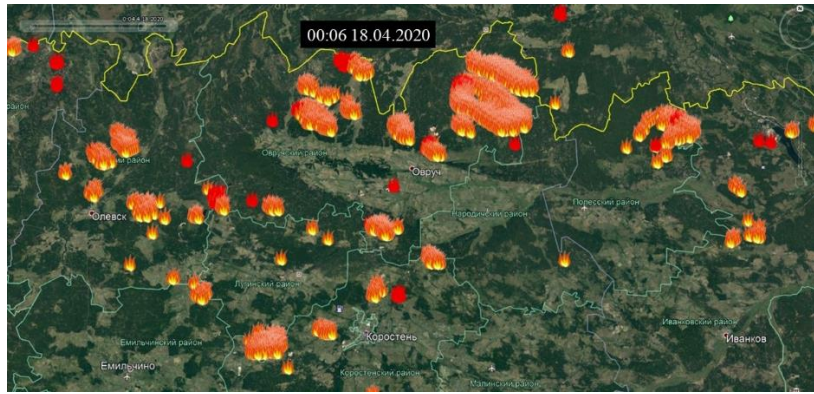


Fig. 1. Fires burning across 150-km part of Ukrainian-Belorussian border in the Chernobyl Exclusion Zone and northern-eastern parts of Zhytomyr oblast during the last 48 hours. Source: FIRMS, 22 April 2020.

Between 16 and 20 of April 2020 the essential parts of this year’s wildfires fires burned in Chernobyl and Zhytomyr oblasts and have been brought under control. Some villages and houses were burnt completely (Fig. 2 and 3). Local population were resettled temporarily to shelters. No fatalities were reported officially.



a)



b)

Fig. 2a and b. Numerous forest fires and fires in villages in north-western part of the Chernobyl Exclusion Zone (b) and the Eastern part of Zhytomyr oblast (a) by 17-18 April 2020.



Fig. 3a-d. Burned villages in northern part of Zhytomyr oblast.

Due to fires in northern parts of Ukraine and Chernobyl Exclusion Zone, which had been contaminated by radionuclides after the failure of Block 4 of the Chernobyl Nuclear Power Plant, intensive smoke contamination extended hundreds of kilometers outside of fires and covered city of Kyiv with around 4 million of population and other settlements as well (Fig.4). Small concentrations of ^{137}Cs that potentially could migrate with air mass from the forest fires in Chernobyl registered in Norway: <https://thebarentsobserver.com/en/ecology/2020/04/radioactive-cesium-measured-north-could-origin-chnobyl-forest-fires>.

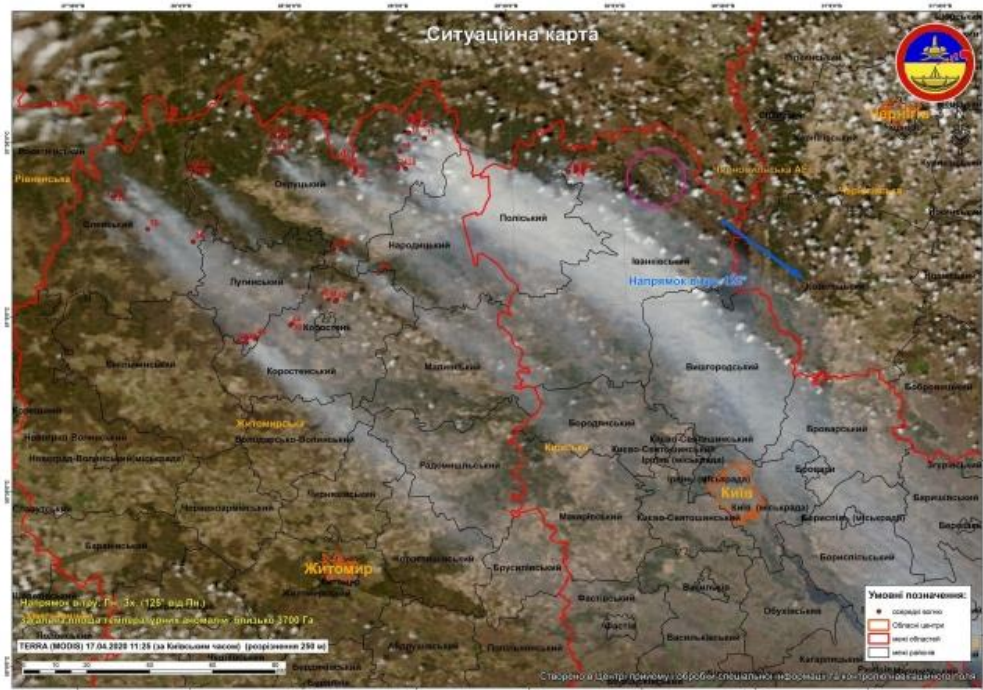


Fig. 4. Radioactive smoke plumes from numerous fires in the Chernobyl Exclusion Zone and eastern part of Zhytomyr oblast moving toward Kyiv and suburban’s territories. Image: Ukrainian Center of Space Shuttles Control and Testing by 17 April 2020.

Modeling regarding air mass trajectories are provided by the Institute for Radiological Protection and Safety of France (IRSN) (Fig. 5).

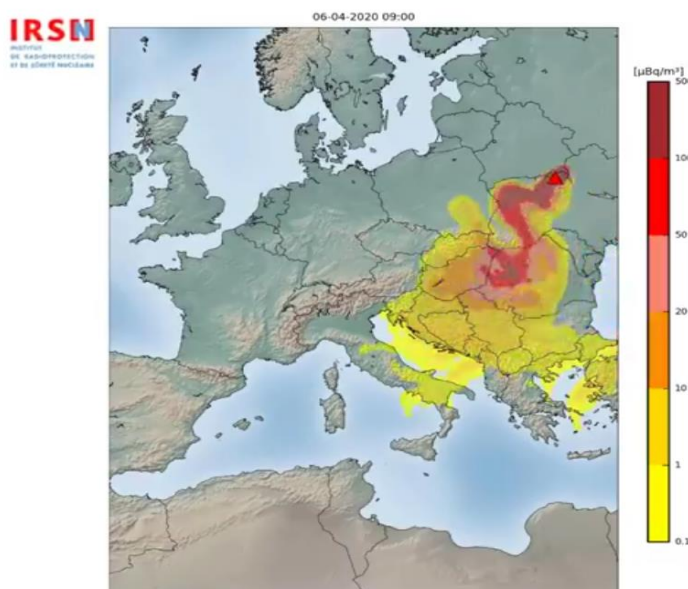


Fig. 5. IRSN evaluated the release of radioactivity by reverse modeling. For details see latest IRSN report: https://www.irsn.fr/EN/newsroom/News/Pages/20200420_Fires-in-Ukraine-in-the-Exclusion-Zone-around-chnobyl.aspx.

See also IRSN reports of 15 April 2020:

https://www.irsn.fr/EN/newsroom/News/Documents/IRSN_Information-Report_Fires-in-Ukraine-in-the-Exclusion-Zone-around-chernobyl-NPP_15042020.pdf)

and 17 April 2020:

https://www.irsn.fr/EN/newsroom/News/Documents/IRSN_Information-Report_Fires-in-Ukraine-in-the-Exclusion-Zone-around-chernobyl-NPP_17042020.pdf).

Due to cold and episodic rain weather firefighters close to taking under control most of burning spots. Suppression operation joined military forces and the National Guard for better control of the territory. In the Chernobyl Exclusion Zone, the total mobilization included 1800 emergency and forestry fire fighters and about 500 engines and other equipment. In Zhytomyr oblast 1200 firefighters and 400 engines are operational.

End of the Press Release of 22 April 2020

The GFMC and REEFMC are partners of and providing advisory support in landscape fire management to:



Previous Press Release of 16 April 2020

As of 12 April 2020, according to the remote sensing data, burning at northern edge of fire continued in the core 10-km zone of the Chernobyl Exclusion Zone (CEZ) with a total area of at least 8 000 ha (Fig. 1).

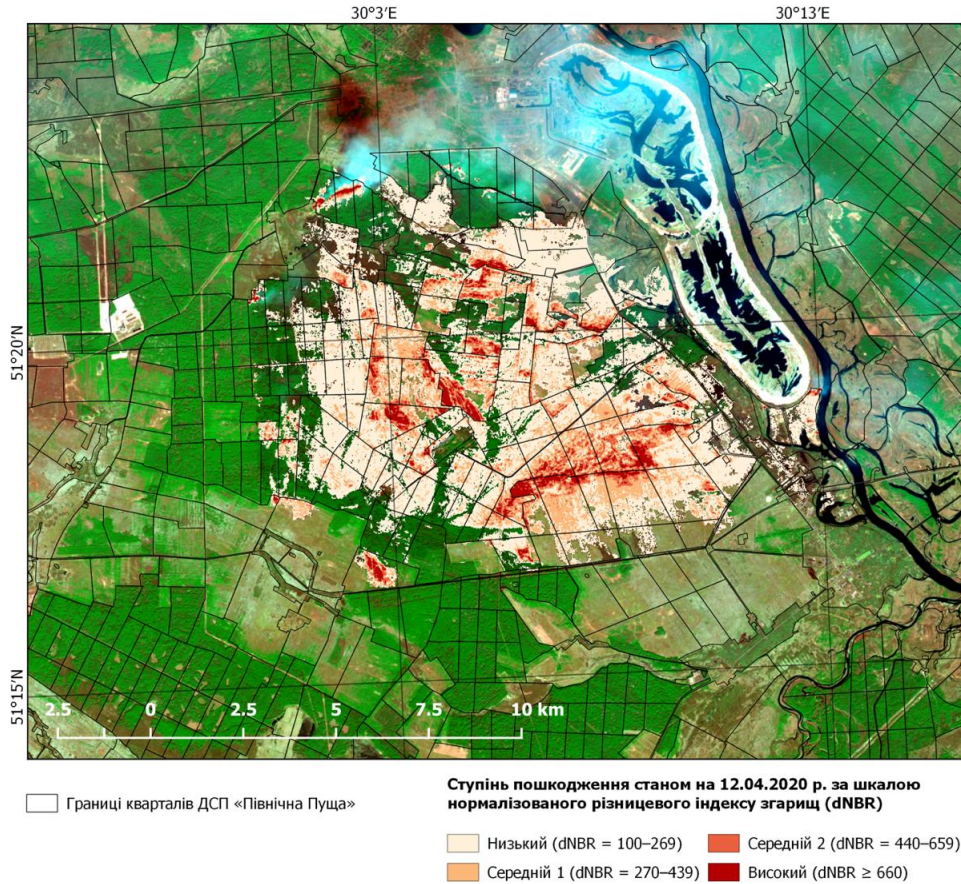


Fig. 1. Fire in a 10-km zone of the Chernobyl Exclusion Zone as of 12 April 2020. Area is 8 000 ha (excluding part of surface forest fires). Light in color - grass fires with burning regeneration of pine, birch, shrubs and other tree species. Shades of red are forest crown fires and intensive surface forest fires.

Most of the fire during 8-12 April developed in a 10-km zone, which is not part of the Chernobyl Radiation and Ecological Biosphere Reserve, but is the area where the fire management is carried out by the Chernobyl Forestry Enterprise “Pivnichna Puscha” (Fig. 2).

As of 12 April 2020, the total area burned by fires in the Drevlyanskii Nature Reserve reaches 6 000 ha, in the Chernobyl Radiation and Ecological Biosphere Reserve – 11 500 ha (in the Western part of the Exclusion Zone: Denysovetske and Kotovske Ranger Districts), and the 10 km zone. – 8 000 ha (Fig. 3).

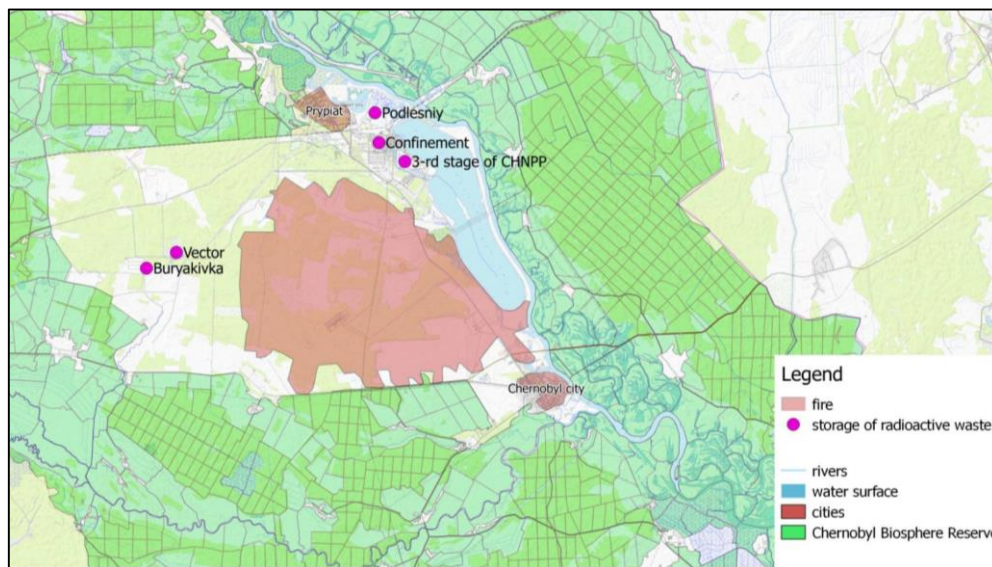


Fig. 2. Fire contours in the core 10 km zone of the Chernobyl Exclusion Zone during 8 to 12 April 2020 (pink). The area of the 10 km zone is highlighted in Light Green and White. Dark Green: Chernobyl Radiation-Ecological Biosphere Reserve.

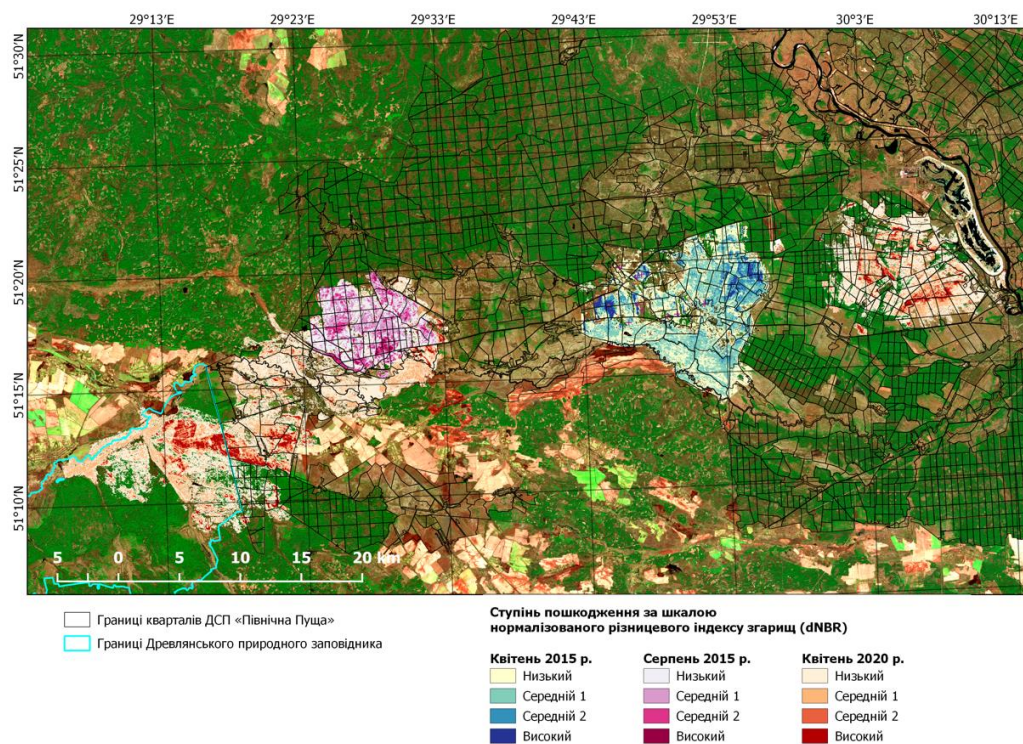


Fig. 3. Fires in the CEZ in 2015 (April: Blue, August: Purple) and in 2020 (shades of red).

End of Press Release of 16 April 2020

Wildfire Situation in the Western Part of the CEZ near Narodychi City – 29 March to 12 April 2020

According to satellite remote sensing data, the first large fire in the Western part of the Chernobyl Exclusion Zone (CEZ) began on 29 March in the floodplain of Uzh river and burned territories mainly outside the CEZ. A small fire of the fire crossed the boundaries of the western part of CEZ and was stopped. The total area of the fire on 29 March 2020 was 736 hectares (ha) (Fig. 1). The fire mainly burned on grasslands.

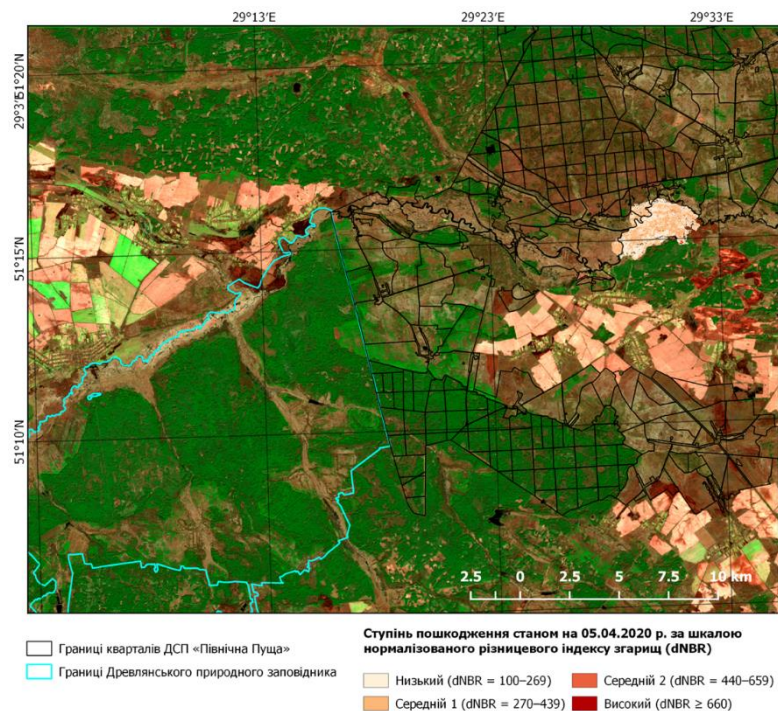


Fig. 1. The first fire near the western border of the Exclusion Zone, which took place on 29 March 2020 in the floodplain of Uzh and crossed the border of the CEZ and was stopped. Area burnt: 736 ha.

During the period 3 to 10 April 2020, a second large fire occurred, which started at the boundary of the floodplain of Uzh River and Narodychi City and spread towards Northeast along the territory of the Drevlyansky Nature Reserve and subsequently to the CEZ (Fig. 2). As of 10 April a fire from the Northern part burned in the Forest Management Units 183-186, 188, 189 and partially 205 of the Denysovetsky Districts Forestry of the North Puscha Forestry State Enterprise (Fig. 3).

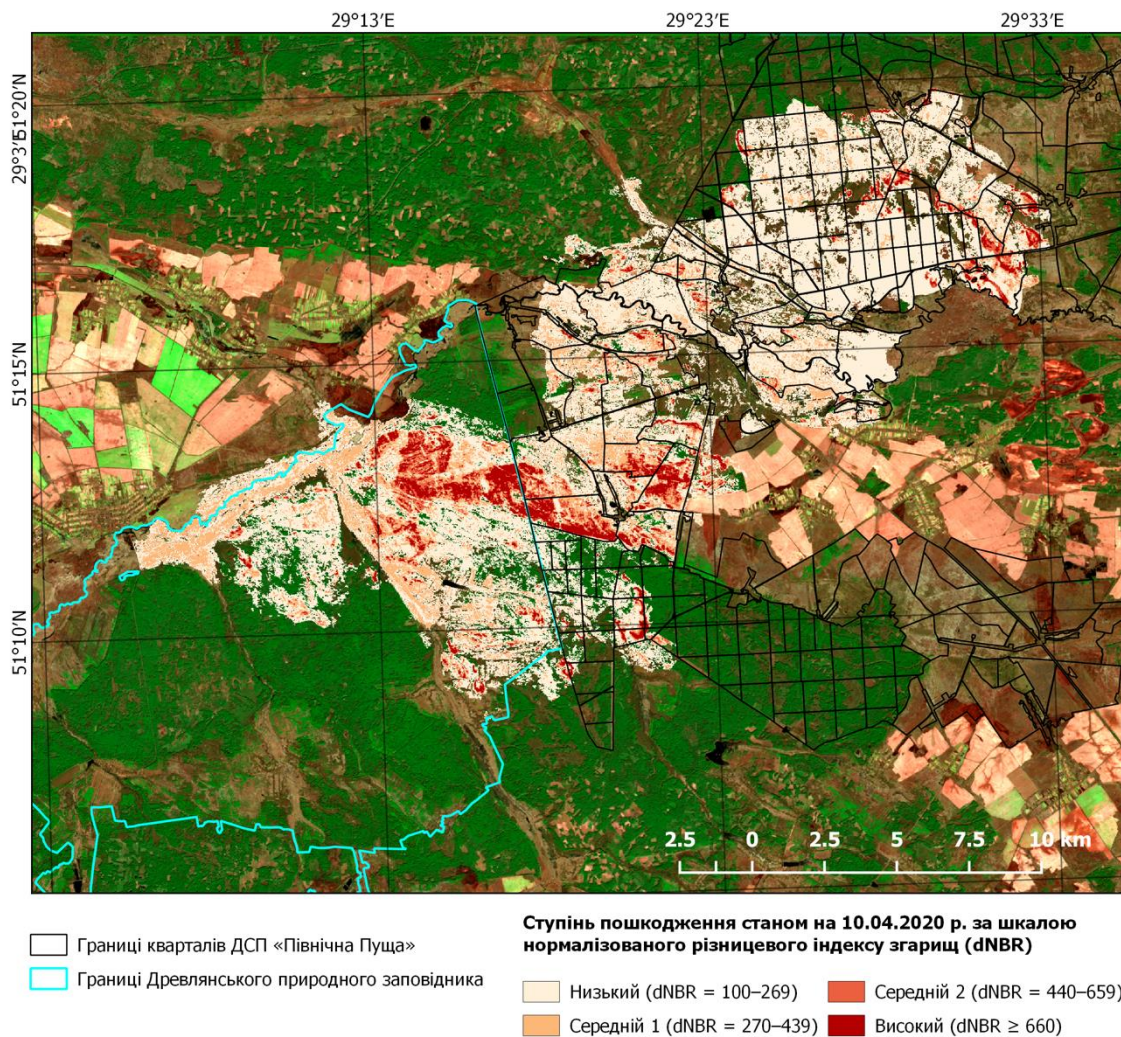


Fig. 2. Between 3 and 10 April 2020 the wildfires burning in the vicinity of the settlements of Narodichi-Polissye, passed the territory of the Drevlyansky Nature Reserve and later entered the CEZ. The total area of the fire on 3-10 April was 19 200 hectares, including 6 000 ha in Drevlyanskiy Nature Reserve and 11 500 ha in the CEZ.

Between 3 and 10 April 2020 the fire merged with the burned area of the fire on 29 March 2020 (Fig. 1), resulting in a total area burned of 19 936 ha 10 April 2020 near Narodichi City and inside the Western part of the CEZ.

During 5 to 10 April 2020 the wildfire on the territory of the Denysovets Forestry of the Northern Puscha Forestry (Chernobyl Forest) reached the fire same area that was burned five years ago between 1 and 10 August 2015. This area was now completely burned for the second time. Since the forest stands had been largely destroyed by the fire of August 2015 the rate and intensity of this year's fire was reduced. This allowed the firefighting forces to control the fire on 10 April 2020 at the same northern boundary as in 2015 (Fig. 4). However, on 12 April 2020 the fires flared-up again and spread towards North in the direction to Belarus (Fig. 5).

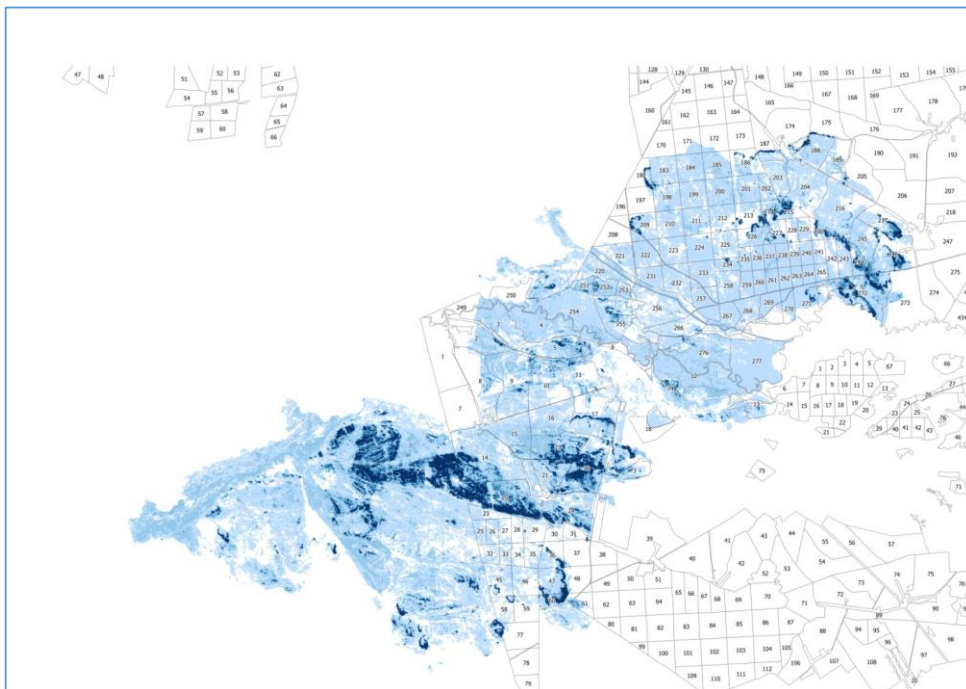


Fig. 3. Burnt areas and burning intensity (Difference Normalized Burn Ratio [dNBR]) during 5-10 April 2020 on the Kotovske and Denisovetske Forest Ranger Districts of Chernobyl Forestry Enterprise “Pivnichna Puscha”

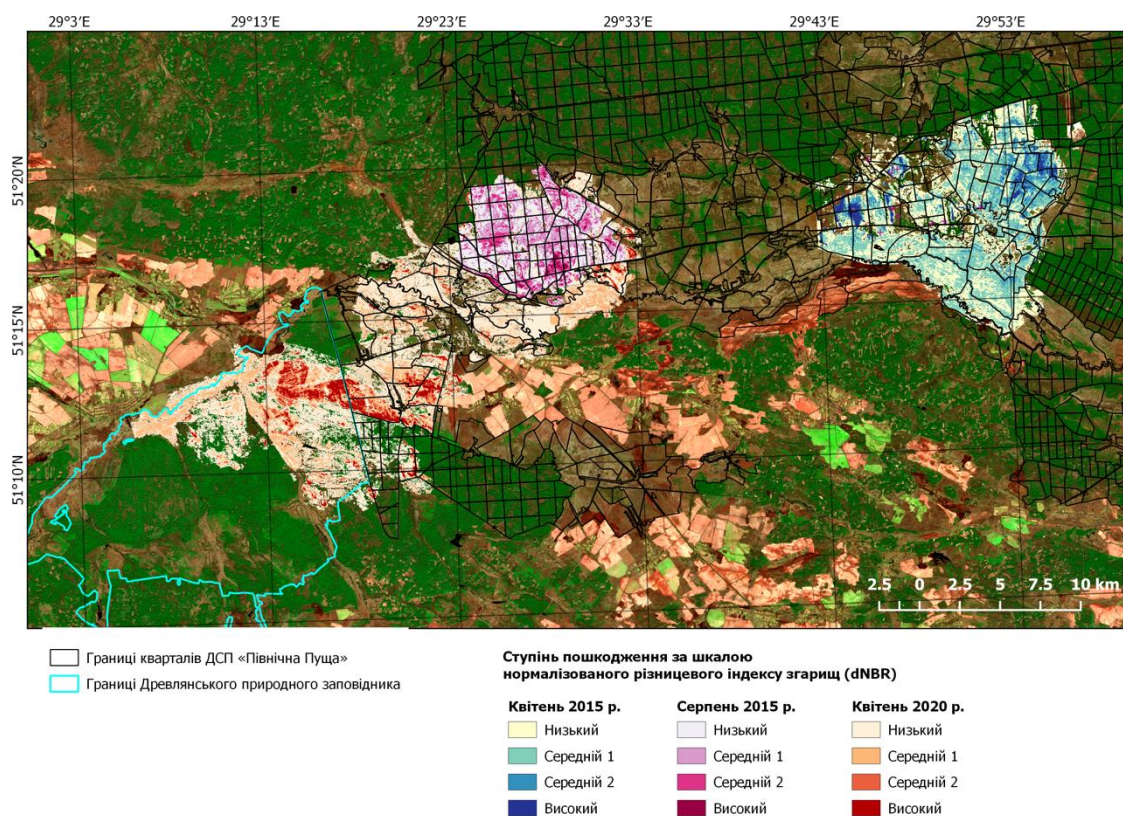
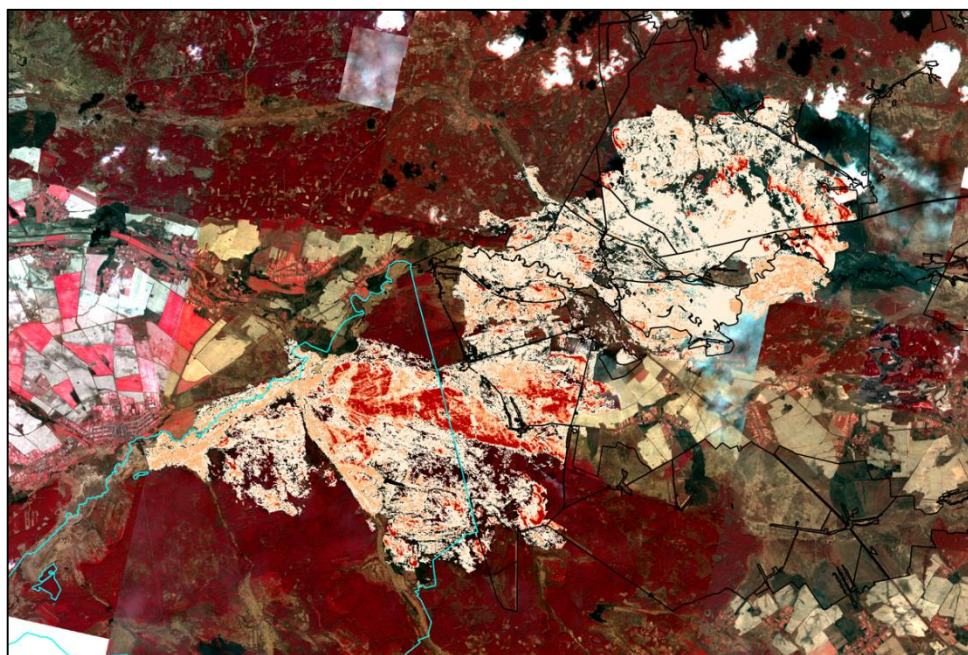


Fig. 4. Three areas burnt by fires in the CEZ and their intensity during 2015 and 2020: 1) 26-30 April 2015 (near Lubyanka village, 10 000 ha, top left, blue); 2) 1 to 10 August 2015 (Denysovetske ranger district, 5 000 ha, upper left), velvet; 3) 3 to 10 April 2020, 19 200 ha, red). The total area burnt by fires in 2015 and 2020 is 34 200 ha (not including the 10-km fire that began on 8 April 2020).

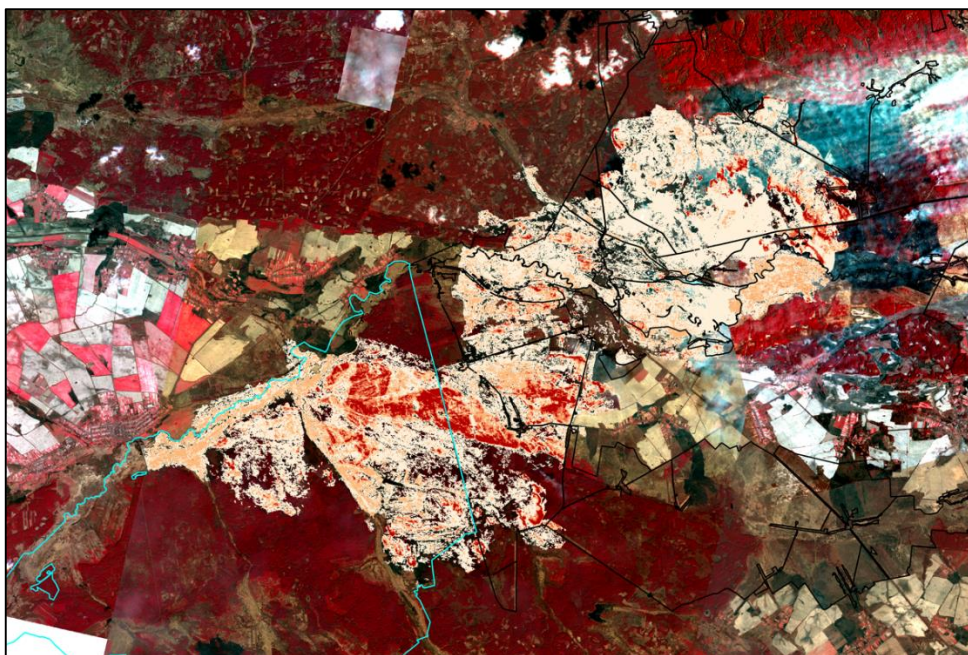
In summary, three large fires occurred in the CEZ in 2015 and 2020 (Fig. 4):

- 1) 26-30 April 2015 (near the village of Lubyanka, 10 000 ha, top left on the map)
- 2) 1-10 August 2015 (Denisovetsky Forestry, 5 000 ha, top left on the map)
- 3) 3-10 April 2020 (19 200 ha)

The total area burnt by fires in 2015 and 2020 is 34 200 ha



a)



b)

Fig. 5. Development of the fire in the western part of the CEZ as of 11 April 2020 (a) – burning continues at the Northern edge of the fire under the Western wind direction; and 12 April 2020 (b) – under the Southwestern wind the fire intensified and moved in the direction of the Belarusian border. Imageries: PlanetScope; acquisition dates: 11 April (a) and 12 April 2020 (b).

The fire in the 10-km zone, which began on 8 April 2020 currently continues to burn. The spread of the fire is being monitored and will be announced in the near future. As of 12 April 2020, the fire in its Northern part continues to develop (Fig. 6).

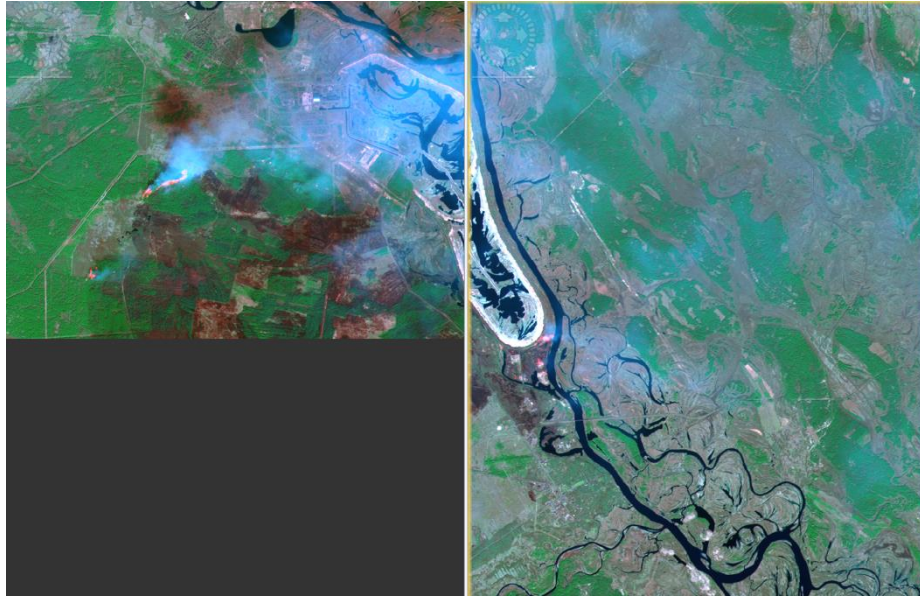


Fig. 6. Burning wildfire in 10-km zone of the CEZ as of 12 April 2020

End of press release of 13 April 2020

Press Release on Chernobyl Wildfires – 10 April 2020

During 6 to 9 April 2020 the area affected by wildfires in the Western part of the CEZ increased accordingly to preliminary assessment to approximately 4 000 ha, and total burnt area near Narodychy Poleskii reached 12 000 ha (the area will be additional confirmed) (Fig.1).

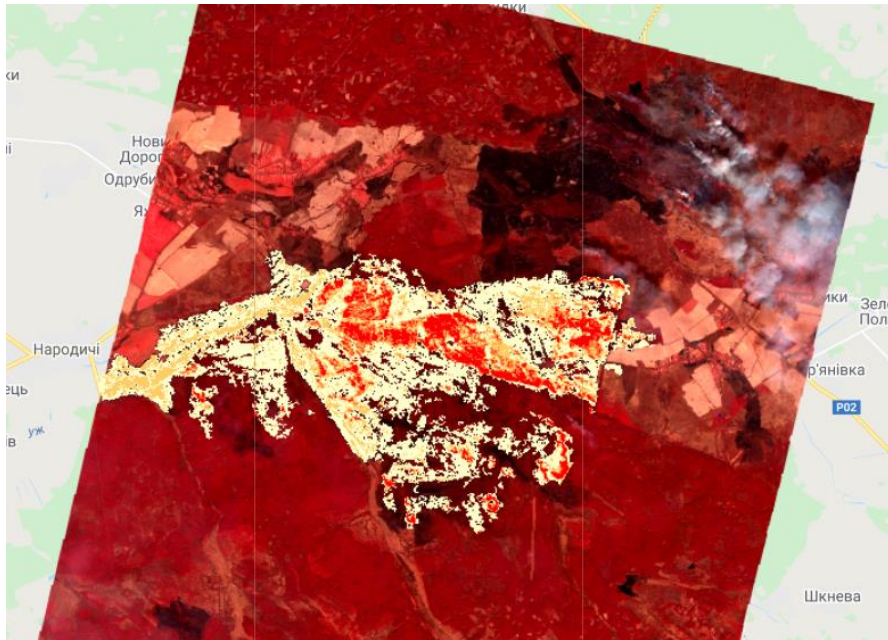


Fig.1. Fire that is burning near Narodychy-Poleskii cities in the Western part of the Chernobyl Exclusion Zone (CEZ). By 10 April 2020 total area reached up to 12 000 ha. Image: PlanetScope, acquisition date and time 2020-04-08 T09:08:30

Another large forest fire started in the core zone of CEZ – near the “Red Forest” (the forest most contaminated and damaged by radiation stemming from the failure of Block No. 4 of the Chernobyl Nuclear Power Plant in 1986 (see figures below).

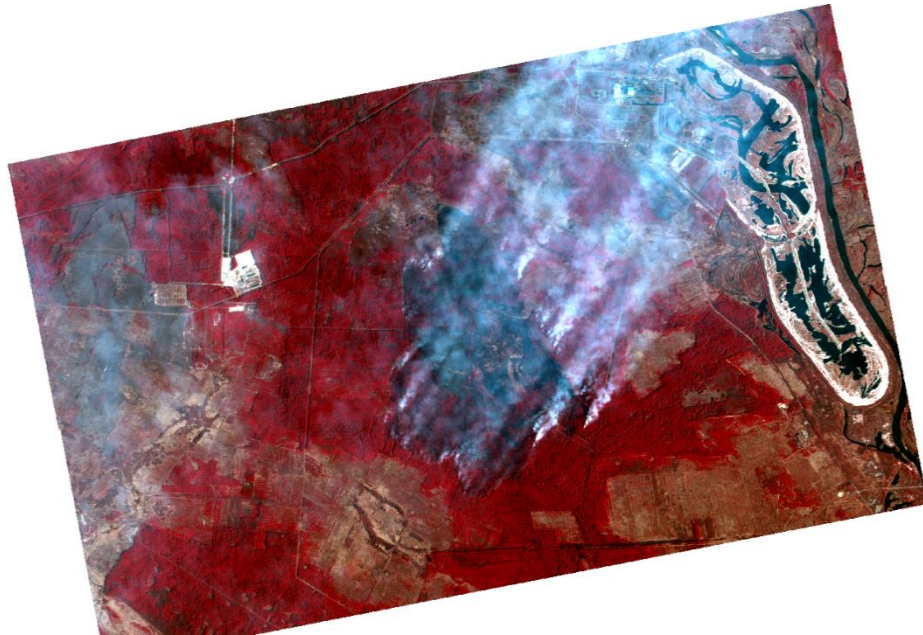


Fig.2. Large forest fire occurred on 8 April 2020 in close vicinity of Red Forest in 10-km zone of the Chernobyl Exclusion Zone. Smoke is moving toward Belorussia. Preliminary assessment shows burned area at least 2000 ha. Image: PlanetScope, acquisition date and time 2020-04-09 T06:21:33

The State Scientific and Technical Center for Nuclear and Radiation Safety (SSTC NRS) of Ukraine provides forecasts of the movement of air masses potentially contaminated by fires burning in the CEZ (Fig.3.).

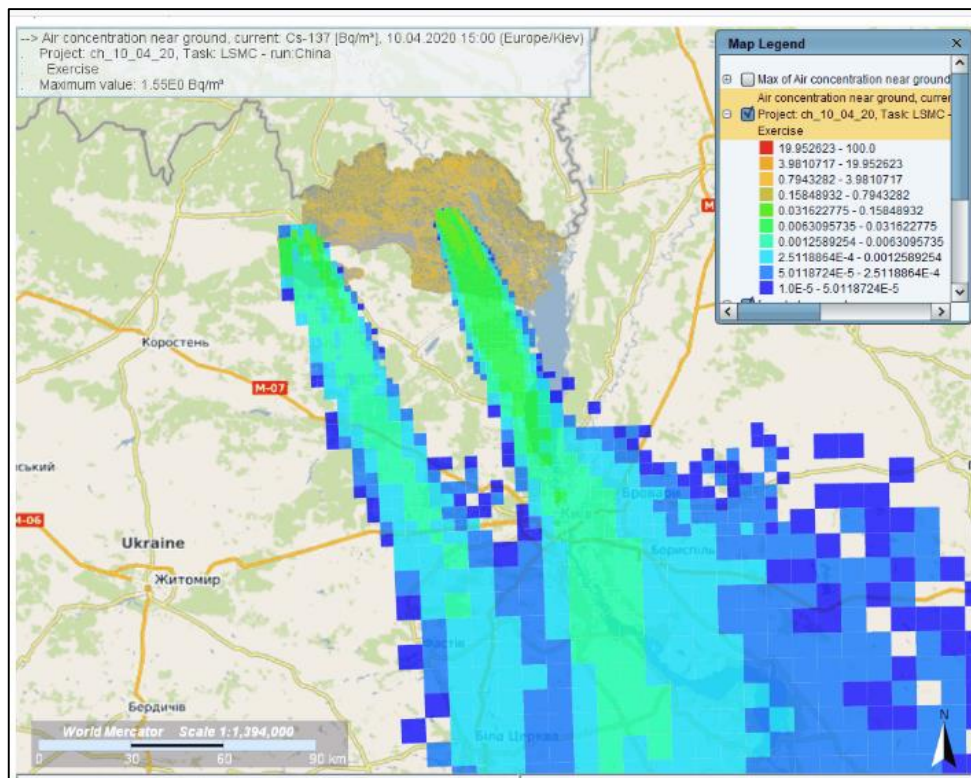


Fig.3. Large SSTC NRS model of smoke spread from CEZ on 10 and 11 April 2020. Please visit the English version of the SSTC NRS website:

<https://sstc.ua/news/prognoz-peremishennya-potencijno-zabrudnenogo-atmosfernogo-povitrya-zumovlenogo-pozhezhami-v-chzv-na-10-11-kvitnya>



Fig.4. Active fires burning in the so-called “Red forest”, the most contaminated forest close to the sarcophagus of Block 4 of the Chernobyl Nuclear Power Plant, on 9 April 2020. Source: Planet.

A few photos from the ground visualize the generation and transport of fire smoke from the CEZ:



Photos: Denis Vishnevskii



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Press Release of 10 April 2020

Radiological Safety Advisory in Relation to Wildfires in the Chernobyl Exclusion Zone (CEZ)

Civil society of Ukraine in general is aware and informed about the potential threats of radioactive contamination caused by the failure of Reactor Block 4 of Chernobyl Nuclear Power Plant in 1986. Wildfires burning in the contaminated forests in the Chernobyl Exclusion Zone (CEZ) bear the risk of redistribution of radionuclides by the smoke transport. In some cases, the re-distribution of radioactive particles occurs only in the very vicinity of the fires and do not affect populated areas outside the CEZ. Sometimes the smoke columns are transported over longer distances. The radioactivity usually does not reach threshold values critical for human health and security. However, in some cases radioactive particles deposited on agricultural fields, vegetable orchards, gardens or open water bodies may be harmful. Thus, the public is advised to monitor the news and warnings given by State authorities.

In addition, people living, working or travelling in / visiting remote areas of the country are recommended to actively monitor special information sources:

1) The radiological safety of citizens is regulated by the Law of Ukraine “On the Use of Nuclear Energy and Radiological Safety”, that describe principals of nuclear safety of population and environment and responsibility. Monitoring of levels of exposure doses (nZv/per hour) is provided by the Ukrainian Hydrometeorological Center based on regular measurements of this index on the national network of meteorological stations. The status of monitoring is accessible on the Center’s web-site:

- https://meteo.gov.ua/en/33345/racpc/racpc_current_situation/.

2) Highest contamination of the environment is observed in the 10-km zone around failed Chernobyl NPP and all over the CEZ, which is managed by State Agency of Ukraine on the Exclusion Zone Management (<http://dazv.gov.ua/en/>). Furthermore, the territory of Ukraine also covers former industrial sites that used or stored radionuclides. Nuclear industrial facilities are located all over the country and include nuclear power plants, waste management facilities and other objects that controlled by State Inspection of Ukraine on Nuclear Regulations (<http://www.snrc.gov.ua/nuclear/en/index>). Continuously updated maps of contamination are provided here:

- <https://sstc.ua/news/prognoz-peremishennya-potencijno-zabrudnenogo-atmosfernogo-povitrya-zumovlenogo-pozhezhami-v-chzv-na-10-11-kvitnya>

According to the Norms for Radiological Safety of Ukraine (1997) the annual limit of dose for citizen is 1 Milliroentgen (<http://www.insc.gov.ua/docs/nrbu97.pdf>). Agencies responsible for fighting forest fires and grassfires in the CEZ have been provided with detailed guidelines and rules for firefighters. The guidelines were developed by GFMC/REEFMC and OSCE:

- <https://gfmcc.org/globalnetworks/seeurope/OSCE-GFMC-Report-Fire-Management-Contaminated-Terrain-2014-ENG.pdf>

Additional pocket guidelines in Ukrainian are published by the REEFMC:

- <https://gfmcc.org/wp-content/uploads/REEFMC-Chernobyl-Fire-Management-Pocket-Book-2018-1.pdf>

In the following brief recommendations are given to people living, working, travelling or visiting remote areas of the country to actively participate in the preparedness and self-protection of personal health and security to possibly increasing levels of radiation.

Recommendations to people living, working, travelling or visiting remote areas of the country to actively participate in the preparedness and self-protection of personal health and security to possibly increasing levels of radiation

- Monitor alerts and advisories of State authorities concerning additional radiation caused by fire smoke transport
- When travelling in rural areas have sufficient bottle water
- Do not collect and eat berries, mushroom, fruits or vegetables directly from the forest, fields, orchards or vegetable gardens without checking possible contamination
- Close your body tightly around your neck, apply long sleeves (no t-shirts) and full long pants
- A face mask should be worn if a smoke plume or a dust plume (both potentially transporting aerosols / dust particles that are radioactively contaminated and could be inhaled and deposited in the lungs)
- Use a so-called “household dosimeters” for checking the radiation safety of your home / accommodation, place of work, vehicles, household items, clothing construction materials and afore-mentioned vegetables and fruits
- Be alerted and shorten your presence if the threshold of 3 microsievert / hour has been recorded by the personal dosimeter

Geiger counters for personal use

Portable Geiger counters or dosimeters are available on the free market locally in Ukraine as so-called “household dosimeter”. Without exclusively endorsing the product of this manufacturer, but just for the ease of providing a source for swift purchase, dosimeter measures gamma background level and accumulated dose. It can be ordered instantly – visit the website:

DKG-21M

- <http://ecotest.ua/products/dkg-21m/>

Gamma Sapiens detector of gamma exposure intellectual UDKG-01

- <http://ecotest.ua/products/gamma-sapiens/>

Additional advisory support

In case of special situations two institutions may be contacted

- State Enterprise “EcoCenter” (Director: Mr. Sergey Kireev): Tel. +380-(0)4593-522-01
- Regional Eastern Europe Fire Monitoring Center (REFMC) (Head: Prof. Dr. Sergiy Zibtsev)
Tel. +380-67-261-1682

The GFMC and REEFMC are partners of and providing advisory support in landscape fire management to:



Press Release of REEFMC of 5 April 2020

Please note that the threat of radiation in the early days of the fire episode was lower than on 10 April 2020

Since 2007, REEFMC has been actively working with agencies of Ukraine and international partners (the Global Fire Monitoring Center [GFMC] by sponsorship of the Council of Europe's Major Hazard Agreement and the Organization for Security and Cooperation in Europe [OSCE], and the US Forest Service) over increasing preparedness and safety and capacity of fire management in terrains contaminated by radionuclides in the Chernobyl Exclusion Zone (CEZ) [1]. In April and August 2015 two major wildfires inside the CEZ burned around 15.000 ha. The emissions of these fires resulted in aerial transport of radionuclides beyond the CEZ borders [2].

Based on the dedicated activities of REEFMC and partners, including the support by US Forest Service, a number of recommendations and guidelines have been developed between 2016 and 2018, aimed at improvement of individual protection of firefighters, strategies and tactics of fire management in contaminated terrain. Among other, a burn probability map of CEZ and vicinity was developed that can be used by firefighting services to prevent fires and provide a fast fire response (the map is available on the website of REEFMC) (Fig. 1.1) [3, 4, 5, 6].

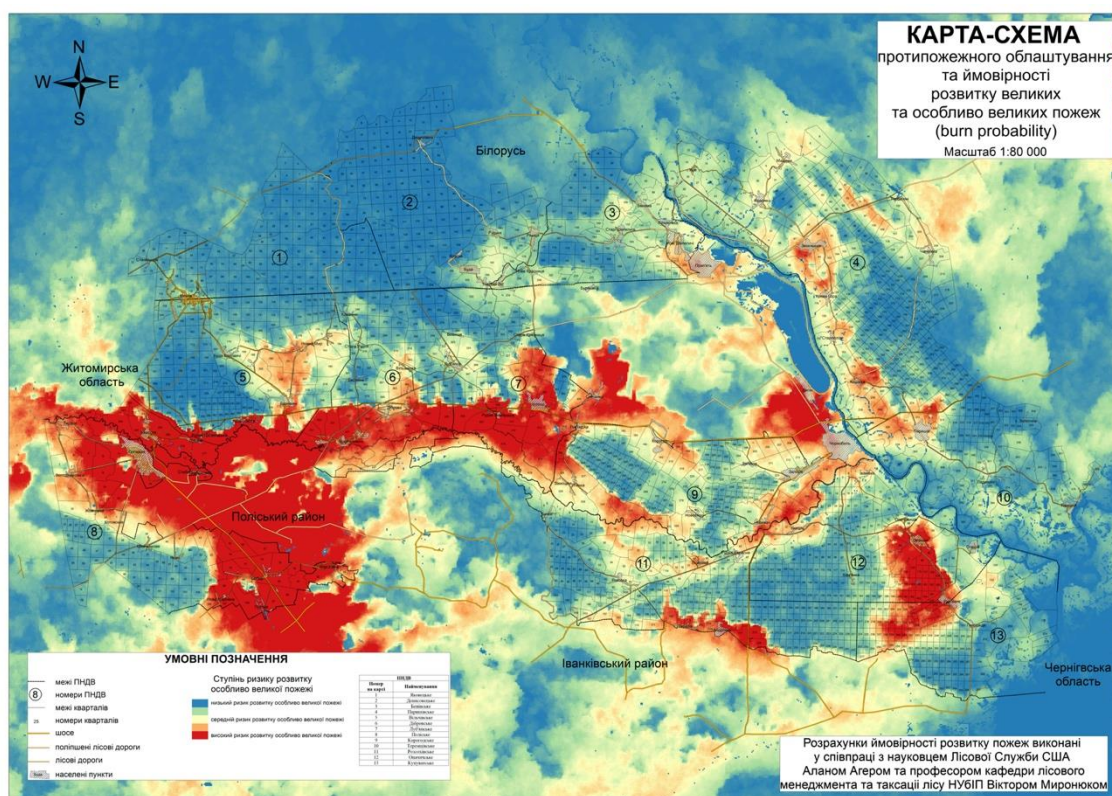
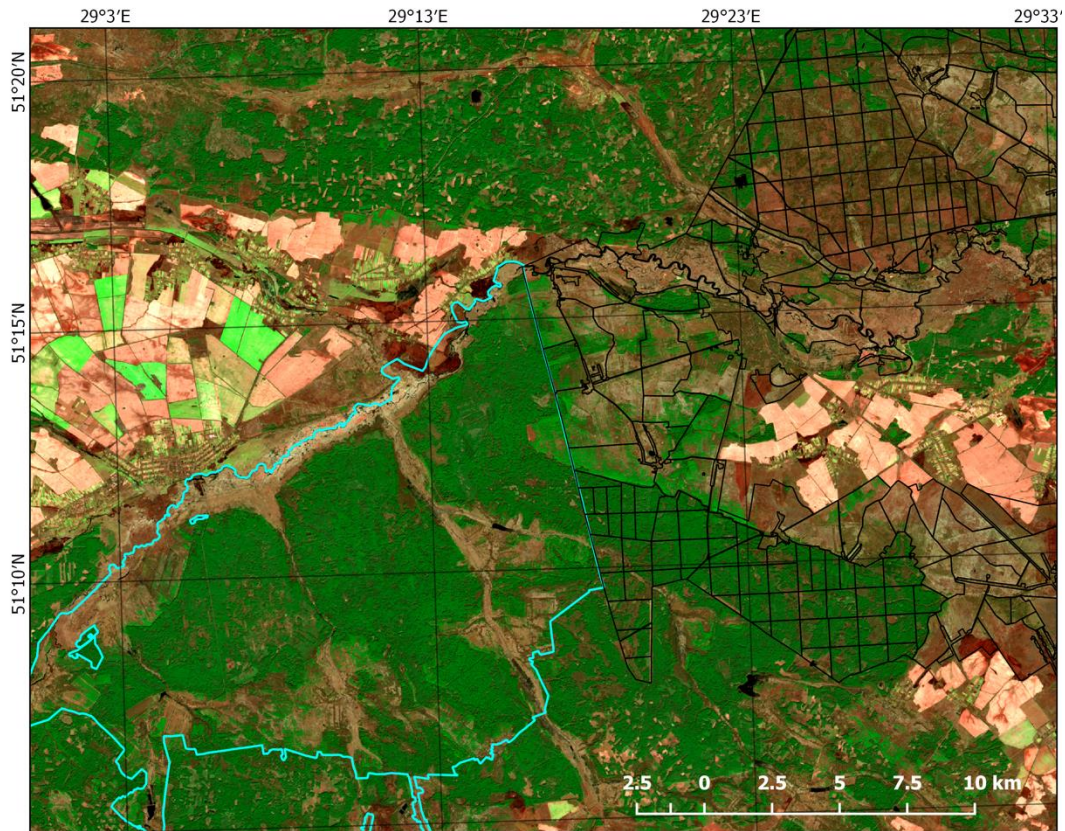


Fig. 1.1 Distribution of the burn probability index across the CEZ and firefighting infrastructure. REEFMC: S. Zibtsev, V. Myroniuk, V. Bogomolov, O. Soshenskiy (2020).

Area of the fire on 3-5 of April 2020 has high burn probability and high radionuclide contamination (Fig. 2.1) between Narodychi city, the Drevlianskiy Nature Reserve and the CEZ. The area affected by fire has no maintained road system and is hardly accessible for firefighting brigades.

The fire started at the western Chernobyl radioactive contamination path, bordering with Narodychi city and the Uzh River floodplains (Fig. 2) at around 17:00 / 18:00 h on 3 April 2020, probably because of intentional or unintentional grasslands / pasture burning, under west direction wind with speed 3-5 m/s.



- Границі кварталів ДСП «Північна Пуща»
- Границі Древлянського природного заповідника

Знімок Sentinel 2 до пожежі (26 березня 2020 р.)

Fig.2.1 Pre-fire situation: blue line – border of Drevlianskii Reserve; black lines – forests of CEZ, villages and farmlands. Source: Sentinel-2, 26 March 2020.

In the morning on 4 April and during 5 April the wind had speeded up to 5-8 m/s, which contributed to fast spread of the fire (Fig. 3).

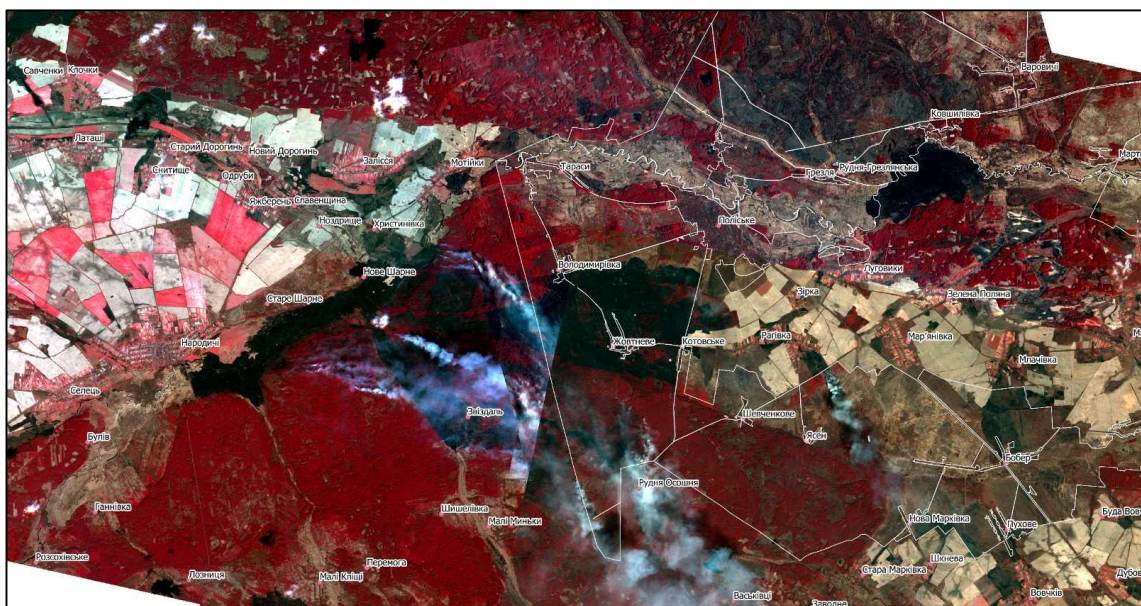


Fig. 3.1 Composite Planet satellite image of the fire development on the territory of the western part of the CEZ, 3-5 April 2020. Image: PlanetScope.

The fire moved across the territory of Drevliansky Nature Reserve towards villages Kotovske and Ragivka on northeast mainly along the left-bank part of the Uzh River floodplain with access to fallows covered by natural renewal of pine and birch, which increased the intensity of burning. The fire moved along the Zvizdal river as well and continued to move towards active farmlands located at the western part of Ragivka village, where it was extinguished or stopped (Fig. 4.1 and 5.1). Fig. 4.1 illustrates a new fire (field burn, which moved to the CEZ), that was ignited by residents of Ragivka on 5 April, despite the fact that a large fire occurred nearby, which was suppressed by fire with.

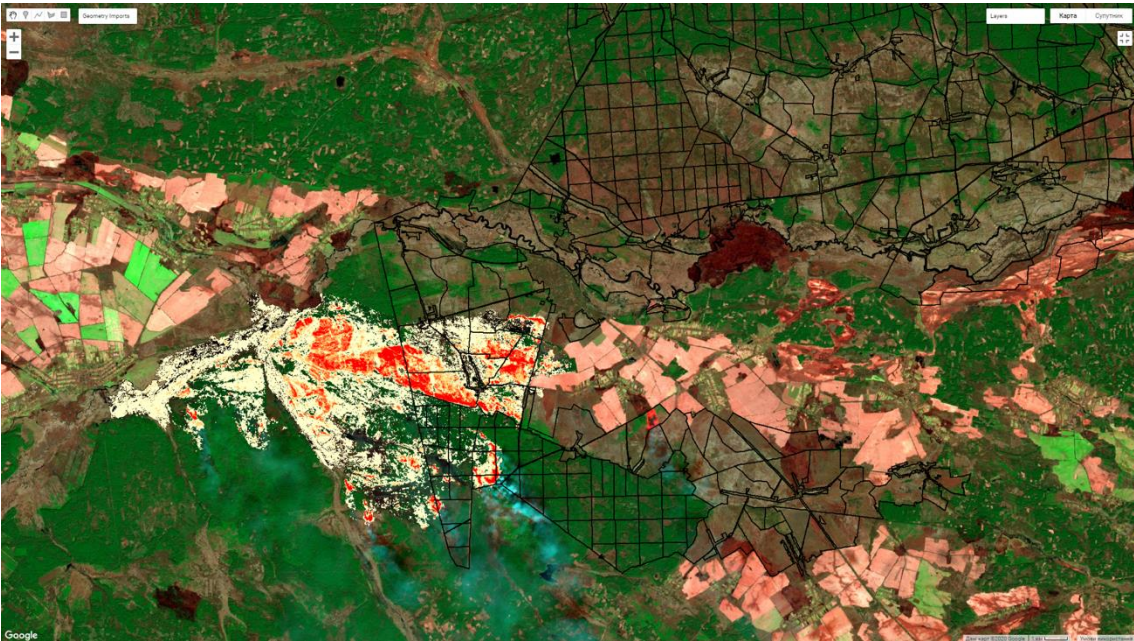


Fig. 4.1 Burning intensity according to dNBR index

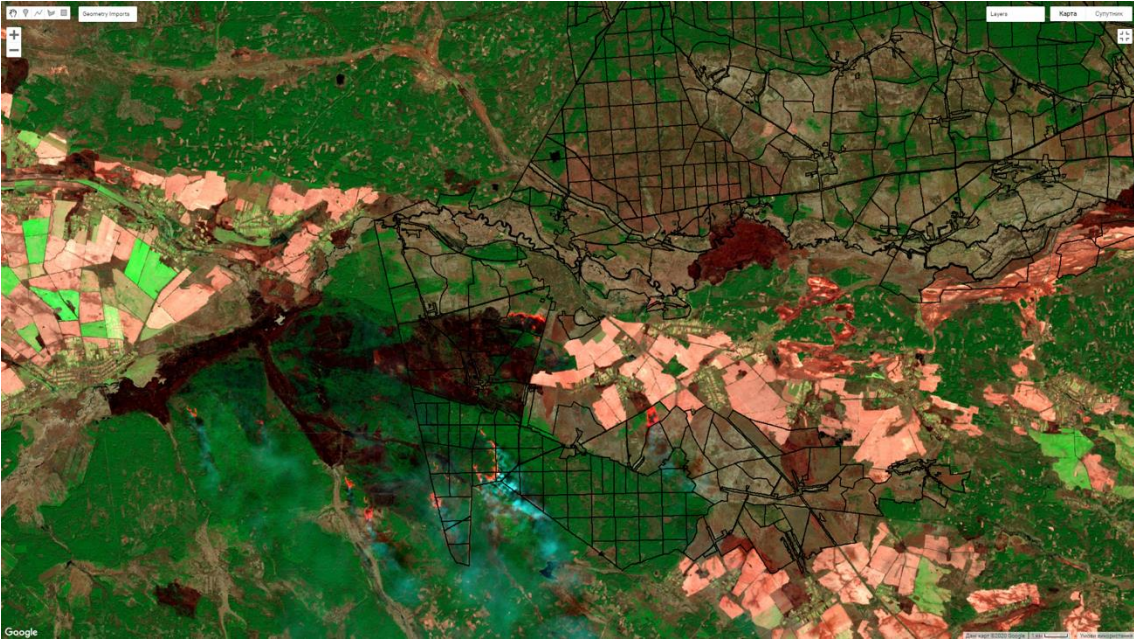


Fig. 5.1 Territory affected by fire on 3-5 April 2020 as of 5 April. According to satellite data the overall area burned is 7811 ha, including 2398 ha of the CEZ and 4914 ha of Drevlianskii Reserve.

Total expected doses of firefighters during one hour of suppression are in range from 0,2 to 2,27 microsievert (Fig. 6.1). As most part of fire burned grasslands with relative low temperature migration of radionuclides with smoke has local scale.

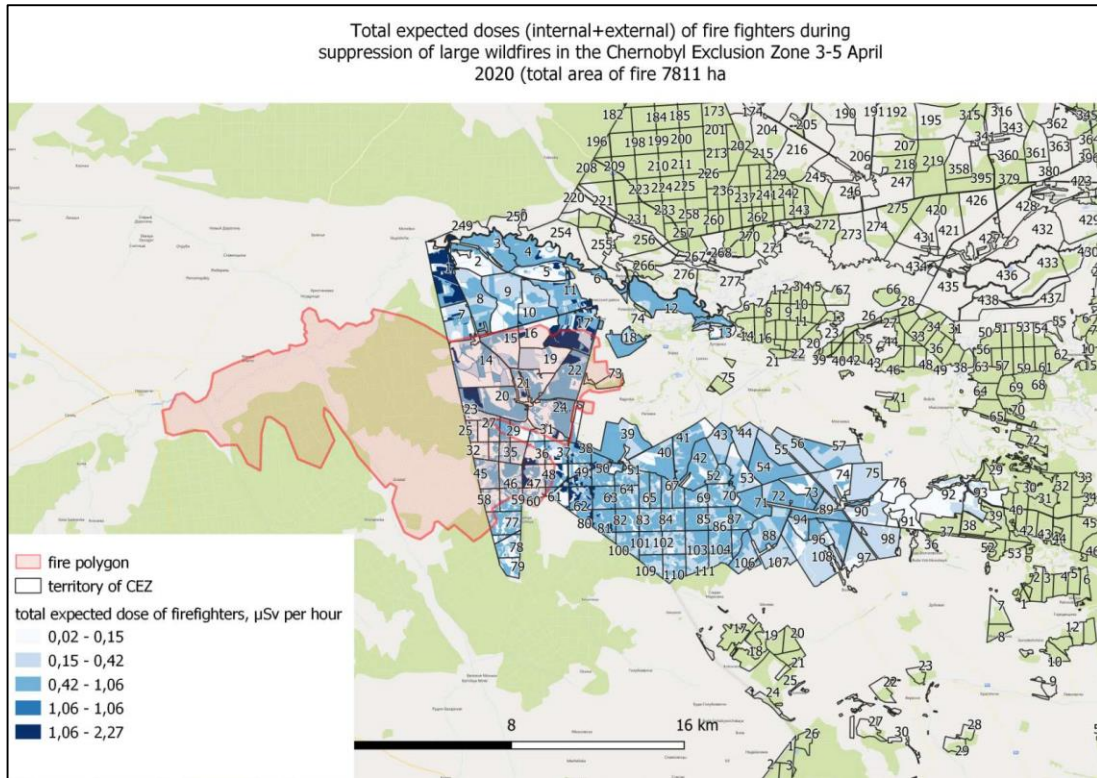


Fig. 6.1 Total expected doses (internal + external) of fire fighters during one hour of suppression on fire line of fire 3-5 April 2020.



Fig.7.1 Aerial view of the fires burning through an intermix of grasslands and forested lands. Photo: State Emergency Service of Ukraine.

Consequences on health and security of firefighters and the public

In the early stage the main fires burned on grasslands, with a low- to medium intensity. According to earlier research the aerial transport and deposition of radionuclides is limited to the immediate vicinity of the fires. Thus, in that stage they represented a threat to firefighters and not to the populated areas in the downwind direction. In the following days the fires moved to forests damaged by the failure of the Reactor Block 4 of the Chernobyl Nuclear Power Plant in 1986.

References:

1. International efforts aimed in increasing capacity of prevention and safe management of fires in the Chernobyl Exclusion Zone <https://nubip.edu.ua/en/node/9087/7>.
2. Evangeliou N., Zibtsev S., Myroniuk V., Zhurba M. et al. Resuspension and atmospheric transport of radionuclides due to wildfires near the Chernobyl Nuclear Power Plant in 2015: An impact assessment. Scientific Reports. 2016. Vol. 6. Article number: 26062. Doi: 10.1038/srep26062. URL: <http://rdcu.be/i1GL>.
3. Ager A.A., Lasko R., Myroniuk M., Zibtsev S., Day M.A., Usenia V., Bogomolov V., Kovalets I., Evers C.R. The wildfire problem in areas contaminated by the Chernobyl disaster. Science of the Total Environment 696 (2019) 133954. <https://doi.org/10.1016/j.scitotenv.2019.133954>. URL: https://nubip.edu.ua/sites/default/files/u184/ager_final_ste_1-s2.0-s0048969719339245-main.pdf
4. Pocket Guideline for forest firefighters of the Chernobyl Exclusion Zone. Regional Eastern Europe Fire Monitoring Center, US Forest Service, 2018. 150 p. https://nubip.edu.ua/sites/default/files/u184/irpg_ukr_chernobyl_forest_firefighters_2018.pdf
5. Burn probability map of the CEZ: https://nubip.edu.ua/sites/default/files/u184/karta_burn_probaility_vb_14-01-2020_1.jpg
6. Global Fire Monitoring Center (GFMC) website on fire management on terrain contaminated by radioactivity and unexploded ordnance: https://gfmc.online/globalnetworks/seeurope/SEEurope_1_radio.html
7. Planet Team (2017). Planet Application Program Interface: In Space for Life on Earth. San Francisco, CA. <https://api.planet.com>