

# RECONFIGURING MARITIME AND RIVER OPERATIONS BY USING NAVAL DRONES

Commander Ioan MOLDOVAN

*Romanian Naval Forces*

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*The use of naval drones in maritime and river operations requires an analysis of the combat space and innovative perspectives on future maritime security. This article aims to address a less explored issue, namely the effects of the use of naval drones on naval tactics. This scientific article uses online content analysis to identify the use of naval drones in maritime and river military actions, as well as the frequency of occurrence of the term naval drones or derivatives in the online environment. For this purpose, we have proposed the analysis of three situations, related to the use of drones in military and non-military actions, with the help of a tool to centralize Internet searches and observe trends in the field. The novelty of this article for the prospect of reshaping maritime and river operations using naval drones, and the potential repercussions lies in future maritime security. This approach addresses all maritime researchers and naval practitioners concerned with adapting naval tactics to the dynamics of capability development.*

*Keywords: reconfiguration of maritime operations; naval drones; USV; naval tactics; FPV;*

## INTRODUCTION

Reconfiguring maritime and river operations by using naval drones brings into question a different approach to naval tactics used for military actions in the maritime and river areas, as well as for the protection of critical maritime infrastructure.

The scientific article addressed a problem less studied so far in national and international scientific papers, the effects of using naval drones on naval tactics, in the online environment, in the period 2022-2025.

During the online content analysis applied to the use of naval drones in conflicts, we felt the need to synthesize the information encountered on the 3 major regions, the Red Sea region, the South China Sea region and the Black Sea region, in order to exemplify and identify the specific maritime security features, as well as to conclude possible effects of the use of naval drones on tactics.

Regarding literature review, the authors S. Dumitrescu (2025) and P.C. Katoch (2021) present insights into the use of naval drones to protect critical maritime infrastructure, but do not address the possible effects of the use of naval drones on tactics.

Author Horton (2024), analyzes the prospect of developing Houthi rebel bases, but does not sufficiently address the use of naval drones and the effects on naval tactics of the fleets of the countries of the Red Sea region. The author Trevithick (2025) deals with the use of naval drones in the South China Sea region, but does not present possible effects on the naval tactics of the countries in the region.

Next I will present the research methodology and the structure of the article.

The main research objective of this article is the impact of the use of naval drones on tactics, as it appears online, in the period 2022-2025. The main research question that this article is trying to answer is: *What are the effects of using naval drones on tactics?*

In this context, the article was divided into two parts following a logical progression. Thus, initially, we exemplified three analysis situations from different regions and presented the impact of search interest in the online environment. Later, we compared the three situations and highlighted implications related to the research question.

Our scientific approach was empirical, using qualitative research. For the collection of data we used the online content analysis method, systematically analyzing online content to identify the frequency of occurrence of certain online words related to the use of naval drones. The results were mainly based on secondary data, the researcher having an important role in content analysis and interpretation of data of authors from the online environment. The research also used more than 70 websites that looked at the use of naval drones in military actions or against critical maritime infrastructure in the analyzed regions.

In the first part of the article, we used a tool to centralize Internet searches and trend observation, Google Trends, for searched topics specific to the use of naval drones in conflicts. As for Google Trends, we only used two tools to chart the level of search interest over a period and highlight the search interest by region. The chart includes values from 0 to 100, and the numbers represent the search interest associated with the highest point in the chart, for the specified region and time. The value of 100 represents the maximum popularity of the term in the period under investigation, and the score of 0 shows that not enough data are available for this term. Highlighting the search interest in the form of a world map has the following characteristics reported to the term of drone ships, thus: keeps the same scale of score from 0% to 100% and highlights with blue color and according to popularity, higher probability of the term sought. Obtained charts and highlighted maps are screenshots of the Google Trends app for the subject being searched in the desired period.

In the second part of the article we used searches of nominal phrases, nominal expressions and nominal groups in indexed databases and Google search engine for the investigated subject, as follows: houthis pirates, houthis, underwater drones China, Crimean bridge, Ukrainian naval drones and other derivatives of naval drones, USV, UUV, FPV.

We will continue to highlight the limits of research. In the first part, charts that highlight the search interest can be influenced by the Google Trends tool, which highlights the search interest according to the number of inhabitants of a country. Consequently, small countries are most often highlighted more strongly on the world map influencing the icons obtained. In the second part, not having enough data available from scientific articles, we turned to online sites to identify the possible effects of the use of naval drones on tactics and, implicitly, on the critical maritime infrastructure of the states in the analyzed regions.

## USE OF NAVAL DRONES ON CRITICAL MARITIME INFRASTRUCTURE

In this first part, we will present the impact of the use of naval drones on tactics and critical maritime infrastructure, as it appears online, after 2022 so far, from the regions of the Red Sea, South China Sea and Black Sea.

The scientific approach analysed several bibliographic sources on the Internet in order to identify the impact of the use of naval drones on naval tactics and, implicitly, on critical maritime infrastructure at global level, in order to identify the countries interested in the subject and the search interest from 2022 to the present.

### *Red Sea Region*

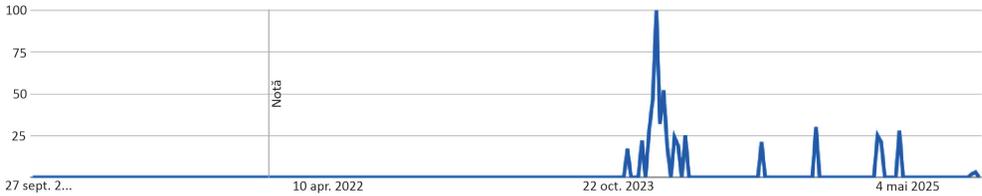
In the Red Sea Region, our research has identified kamikaze surface naval drones owned by non-state actors, the Houthis rebels. Naval drones have been used in maritime terrorism actions on merchantships and military vessels since 2017. The most plausible example in this region is the hit of a Saudi frigate by a kamikaze naval drone by the Houthis rebels in 2017. The naval drones struck the frigate behind the superstructure with the aim of damaging propulsion and governance (Arabia, 2017). Following this attack on the frigate, the ship and helicopter located on the deck were taken out of operation. In this region, the Houthis rebels affected the security of maritime communication lines at regional and international level by executing numerous attacks on merchant ships (Aljazeera, 2019). Moreover, the Houthis rebels, from the time of the declaration of support for the Hamas group involved in the Gaza War on 7 October 2023 to the end of 2024, engaged a substantial number of merchant ships of about 134, with missiles, air drones and naval drones executing direct strike missions, for the incapacity crossing of ships transiting the Red Sea (Horton 2024, pp. 15-22).

On 12 June 2024, about 66 Mm southwest of Yemen's Al Hudaydah port, the Houthis rebels engaged a merchant ship by using a combined kamikaze surface naval drone from the stern of the ship in order to reduce the ship's manoeuvring capacity, and then by launching a missile towards the target (UKMTO, 2024). Following the attack, the ship was captured by the Houthi group and transported to the nearest port.

Another notable attack, on 6 July 2025, about 51 Mm southwest of Yemen's Al Hudaydah port, occurred on a swarm of surface kamikaze naval drones, grenade launchers on board fast and military assault weapons boats attacked a merchantship

(UKMTO, 2025). Following the attack, the ship was hit by two naval drones on board the port and was sunk.

The last report on the Internet from 2022-2025 on the level of interest of the topic houthis pirates according to Google Trends is as follows:



Numbers are the search interest associated with the highest point in the chart, for the region and the specified time. The value of 100 represents the maximum popularity of the term. The value of 50 shows that popularity is half of the maximum recorded. Score 0 shows that not enough data is available for this term (Google Trends, 2022-2025).

The diagram above shows a massive increase in search interest related to the subject under investigation during October 2023 – January 2024, following repeated attacks by houthis rebels on merchant ships transporting goods to Israel as a protest against the Gaza War (Duggal, Haddad, 2024). In the aforementioned period of maximum interest, about 6 months, 40 merchant ships were attacked by the houthis rebels in the waters of the Red Sea. The other periods coincide with attacks on commercial ships using kamikaze drones, helicopters, missiles and aerial drones.

The internet search interest related to houthis pirates, Belgium holds the first position followed by the US countries, Australia, the United Kingdom, the Netherlands, Canada and India, probably the countries interested in international transport and trade.



1	Belgia	100
2	Statele Unite ale Americii	73
3	Australia	70
4	Regatul Unit	66
5	Țările de Jos	61

Include regiuni cu volum scăzut al căutărilor

< Se afișează 1-5 din 7 regiuni >

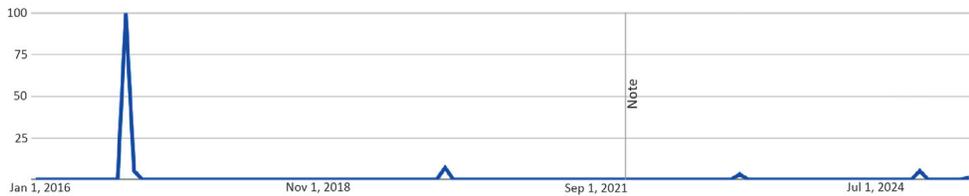
The conclusion of this research is related to a spectacular media impact, the intervention of non-state actors in the control of the Red Sea, the direct hit of a military ship with naval drones, direct engage of merchant ships with naval drones, missiles and aerial drones, a concern of NATO countries and countries in the region to restore maritime security, suspicious activities regarding the identification of the rhythm of activities, and possible implications of some state actors in support of the Houthis rebels, piracy activities and maritime terrorism activities (SANA'A Center for Strategic Studies, 2022).

### South China Sea Region

Underwater naval drones in the South China Sea region have been used under military tensions related to territorial disputes since 2016 (Berglund, 2017).

In the South China Sea region, as early as 2016, there were some underwater drones of Chinese origin that were used in experimental research (Katoch, 2021).

Following the research of several sites from 2016 to date on the level of interest of the subject underwater drone China according to Google Trends, the report is as follows:



Search interest in December 2016 is marked by a global increase in internet searches at a rapid rate of breaking news, and in the other periods only small increases related to finding other Chinese underwater drones (Ib.). The diagram above highlights a massive increase in search interest related to the subject under investigation in December 2016, as an underwater drone was found near Quang Ngai in Vietnam in November 2016 (Swarajya, 2021). Therefore, on 20 December 2020, near the islands of Selayar, Indonesia, a drone was found (Trevithick, 2025), several Chinese underwater research drones were launched in mid-2023 (IntelligenceOnline, 2023), as well as finding a Chinese drone on 30 December 2024 near the coast of Philippines (Trevithick, ib.).

The timing of finding Chinese underwater drones has been marked by remarkable search interest in Singapore, the Philippines, the USA, Australia, India, Canada and the UK, according to Google Trends (Google Trends, 2022-2025).



1	Singapore	100
2	Philippines	49
3	United States	41
4	Australia	25
5	India	22

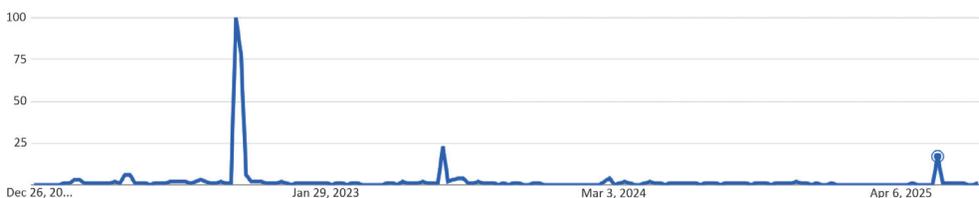
< Showing 1-5 of 7 regions >

Therefore, research in the South China region highlights a media impact such as breaking news for finding Chinese drones (Tsering 2016, p. 1). Also, there is a high search interest of the countries in the competition for the hegemony of the world by USA, Canada and India, but also of the countries bordering the South China Sea that are in permanent uncertainty – Singapore, the Philippines and Vietnam (VnExpress, 2023). Moreover, the use of underwater drones in passive mode could pose a threat to transport capabilities and routes in the region (Trevithick, ib.).

### Black Sea Region

In the Black Sea region, surface, underwater and aerial naval drones are used in the war in Ukraine on both the Ukrainian side and the Russian side to attack critical maritime infrastructure.

Following the research of several sites from 2022 to date on the level of interest of the topic *Crimean bridge* according to Google Trends (Trends, 2022-2025), the report is as follows:



Analyzing the diagram above and taking into account the military events of the analyzed period, we note that the periods of maximum interest of the subject coincide with the attacks of Ukrainian drones on the bridge in Crimea (Goldsmith, 2025). Accordingly, on October 8, 2022, at the top of the diagram's audience, the bridge was the target of a Ukrainian truck loaded with explosives, which led to the burning of a train with fuel tanks on the bridge at the time of the explosion (Kropman, 2022). Moreover, some observers identified surface naval drones on video footage

seconds before the explosion and considered the bridge to be the target of an explosion below the bridge, most likely caused by kamikaze surface drones (Adams, 2022). Another event recorded on the diagram on July 17, 2023, was damage to the bridge in the Kerch Strait with Ukrainian naval drones (Pennington et al. 2023). In 2025, the Crimean bridge was once again the target of naval drones, this time even if surface naval drones were neutralized, most likely the explosion was produced by underwater naval drones (Yan, 2025). The diagram also highlights other increased levels of interest that coincide with media promotion campaigns and the spread of other attacks carried out with Ukrainian naval drones or Russian naval drones.

In February 2023, there is a new increase on the diagram, this time Russia responded in a similar way, attacking a bridge near Odessa with a naval drone (James, 2023). According to Ukrainian publications, Russian naval drones have been the result of cooperation between the French company ECA Group and the Russians since 2017 in order to equip the mine sweepers (Sinitsyn, 2023).

Moreover, on August 28, 2025, the Russian navy for the first time organized a kamikaze naval drone attack on the Danube river, on the Chilia branch, 3 kilometers from the Romanian town of Periprava, in order to hit the Ukrainian ship Simferopol (Defense Romania, 2025). Following the attack, the ship was sunk and the Russian took revenge on the Ukrainian with the same type of kamikaze drone that lost almost half of Russia's Black Sea Fleet.

In the representation below are highlighted over 70 countries around the world marked by an interest in the remarkable search for the subject under investigation, and in particular, this is due to the fact that the bridge in Crimea is the symbol of Russian power at the Black Sea and of Ukrainian attempts to destroy this critical maritime infrastructure for the inhabitants of the Crimean peninsula.



Regarding the search trends of the subject, most likely it represents the interest of researchers in the field of naval drones, naval forces military personnel, all those interested in the use of naval drones in military conflicts, interest in the evolution of war, concerns about the evolution of war and concerns about the prolongation of war with global effects.

Moreover, in the Black Sea region, following the research of the nominal phrase Ukrainian naval drones, several online sources have been discovered that present the use of naval drones together with other vectors or other types of drones. For example, on 10 November 2023, surface naval drones together with aerial drones and missiles carried out attacks on Feodosia, as well as on ships in the port of Chornomorske (Rybar, 2023). In this case, the role of aerial drones was to distract the opponent and execute the drone attack on the surface. Another example, on 07 August 2025, Ukrainian surface drones have transported and launched several First Person Viewed (FPV) drones hundreds of nautical miles away from Ukraine, near the shore, in order to act to neutralize a Russian air defense radar (Stewart, 2025).

In conclusion, there search in the Black Sea region on the use of naval drones on naval tactics and implicitly on critical maritime infrastructure highlights a great global search interest, increasing capabilities with the daily prolongation of the Russian-Ukrainian war, capabilities used more and more frequently in all operating environments to capture the enemy a concern for both camps to use multiple naval drones in war, the use of kamikaze naval drones in the maritime an driver areas, and last but not least the use of drones to destroy or damage critical maritime infrastructure.

## DISCUSSIONS AND IMPLICATIONS

In this part, we will turn our attention to the comparative analysis of the situations studied in the first part, we will present the resulting implications to the research question and possible implications in the Black Sea region.

Comparative analysis of the situations studied

In this part, we will review the studied situations and compare situations with each other. Therefore, the analysis of situations is carried out by highlighting the important elements, capturing the use of drones on critical maritime infrastructure, as well as their interpretation.

In the table 1, we find a brief presentation of the important elements of each studied situation, as follows.

Table 1: Overview of the analyzed situations (author's conception)

	<b>Situation no. 1 Red Sea Region</b>	<b>Situation no. 2 South China Sea Region</b>	<b>Situation no. 3 Black Sea Region</b>
<b>Period</b>	2022-2025	2016-2025	2022-2025
<b>Actors involved</b>	The rebels houthis and Israel	China and riparian countries: Singapore, Philippines, Vietnam	Ukraine and Russia
<b>Causes</b>	The Gaza war Offensive activities to engage illegitimate targets/ Undeclared	Tatonism and territorial disputes	The war in Ukraine Offensive activities to engage legitimate/declared targets
<b>Critical Maritime Infrastructure deteriorated</b>	Sea lines of communication	Sea lines of communication (SLOC)	Natural gas extraction platforms Road and rail bridges
<b>Types of drones utilised</b>	Kamikaze surface naval drones	Underwater marine research drones	Unmanned surface vehicle (USV) Unmanned aerial vehicle (UAS), ISR Drones, Unmanned underwater vehicle (UUV)
<b>Media Impact</b>	Spectacular media impact (7 regions)	Breaking news impact (7 regions)	Global impact (74 regions)
<b>Lessons identified</b>	- Concerns of NATO countries and countries in the region - Aggressive activities of control of SLOC	- High interest countries USA, India, Canada - Territorial disputes - Uncertainty countries bordering Singapore,	- Use of naval drones for the transport of other FPV drones - Territorial claims -International implications

	<b>Situation no. 1 Red Sea Region</b>	<b>Situation no. 2 South China Sea Region</b>	<b>Situation no. 3 Black Sea Region</b>
<b>Period</b>	2022-2025	2016-2025	2022-2025
	<ul style="list-style-type: none"> <li>- Possible implications of some state actors</li> <li>- Activities of piracy</li> <li>- Maritime terrorism activities</li> </ul>	<ul style="list-style-type: none"> <li>Philippines, Vietnam</li> <li>- Possible threats capabilities in the region</li> <li>- Possible threats to transport routes in the region</li> </ul>	<ul style="list-style-type: none"> <li>- Distraction of the opponent's attention</li> <li>- Neutralization of radars and essential sensors</li> <li>- Destroying essential sensors</li> </ul>
<b>Effects of the use of naval drones</b>	<ul style="list-style-type: none"> <li>- Piracy actions</li> <li>- Actions of maritime terrorism</li> <li>- Direct actions of employment of ships</li> <li>- Vulnerability of SLOC</li> <li>- Economic losses at global level</li> </ul>	<ul style="list-style-type: none"> <li>- Manoeuvres for the inspection of underwater structures</li> <li>- Mapping the seabed around critical maritime infrastructure</li> <li>- Possible sabotage actions for intimidation and deterrence.</li> </ul>	<ul style="list-style-type: none"> <li>- Definition of operational environment</li> <li>- Description of the influence of the information environment</li> <li>- Assessment of the opponent</li> <li>- Distraction of the opponent's attention</li> <li>- Destroying essential sensors</li> <li>- Damaging CMI</li> <li>- Destroying targets</li> <li>- Neutralization of radars and sensors essential for air defense systems, ships or OFF-shore platforms</li> <li>- Espionage actions</li> </ul>

Regarding the comparative analysis of the studied situations, we turn our attention to the first two situations. If in the first situation under consideration the actions of naval drones are direct actions of piracy and maritime terrorism, with no declared intention over a short period of time with direct effect on maritime communication lines, in these situation drones carry out maritime research actions over a long period of time, which could have implications on maritime communications capabilities or lines. If in the first situation the drones were used for piracy and affecting the propulsion of commercial vessels near the sea communication lines, in these situation, the drones failed on the coast of the riparian countries and then they aroused questions.

As regards the comparative analysis of the first situation with the third situation, we identify notable differences regarding the protest or support approach, for the Hamas group, of the use of drones in the first situation, in grey areas or in international waters of the states, instead in the third situation, during war time, naval drones are used in the territorial waters of the adverse country with declared intentions of hiring critical maritime infrastructure.

Regarding the comparative analysis of these situation with the third situation, we identify clear differentiation of the use of drones. If in these situation, the drones were used in passive mode, foul mode and sabotage mode, in the third situation the drones were actively used in combinations with other vectors to engage the declared targets.

### *Implications Related to the Research Question*

In this part, we will present the implications of the use of drones related to the research question stated at the beginning of the article – *What are the effects of the use of naval drones on naval tactics?* For this, we will briefly outline the resulting implications and their interpretation.

The surface naval drones used in the Red Sea region could be the result of actions by some state actors in order to destabilize the regional situation by supporting and encouraging some rebels or paramilitary groups to carry out piracy actions and actions of maritime terrorism. Moreover, the naval drones were engaged in direct actions to hit the merchant vessels for the passage in a state of reduced maneuverability, inability to maneuver and until the sinking of the ships. Following the research, it emerged that naval drones could be used to destabilise international freight transport. Consequently, it could have a considerable impact on the vulnerability of communication lines by avoiding this region and choosing longer

shipping routes (Duggal, Haddad, 2024). Therefore, the actions of surface drones used in the Red Sea region could influence the missions of NATO, USCENTCOM, China and the countries of the region, from tactical to strategic level. On a tactical level, military fleets involved in the protection of merchant ships transiting the Red Sea should most likely reconsider capabilities capable of countering multiple threats from the Houthis rebels and only send ships capable of handling threats from surface kamikaze naval drones. On a strategic level, international authorities should probably set up operations to protect containers destined for Europe, provide military support to vessels transiting this region and support the establishment of regional coalitions for the protection of trade of partner states (Aljazeera, 2019). Moreover, the research highlighted the emergence of state actors such as China, which condemn actions against houthis rebels and be able to provide protection to merchant ships.

The naval drones used in the South China Sea could be the result of China's explorations and threats to riparian countries on territorial disputes and the substantial increase in manoeuvres for inspection of underwater structures, mapping the seabed around infrastructure, possibly sabotage with the aim of intimidation and deterrence. All of these possible effects could provide China with advantages in the event of a conflict to define the operational environment or to identify vulnerabilities of critical maritime infrastructure and underwater cable networks.

Naval drones used in the Black Sea region are diversified and adapted for all operating environments, from aerial naval drones, naval drones to surface and underwater naval drones. The wide spread use of drones in the Russian-Ukrainian war could be the result of technological evolution, adaptation of the technique to meet the needs of war, as well as for damage to adverse critical maritime infrastructure. The naval drones carried out missions in support of the special research forces of the theater of operations with the purpose of defining the operational environment, describing the influence of the information environment, assessing the adversary and espionage actions. The drones also carried out missions in support of other capabilities in order to distract attention from objectives of great importance or to deceive the opponent through direct attacks on the essential sensors deployed on critical maritime infrastructure. Moreover, the drones were operated in several environments executing direct attacks for damage to critical maritime infrastructure, target destruction and military neutralization on board OFFSHORE platforms.

Other possible effects of the use of naval drones on tactics could be the detection of adverse ships, patrols in certain districts, detection of submerged capabilities or transport of equipment.

Russia's naval tactics were heavily affected by the attack of Ukrainian naval drones on the Russian Navy at the Black Sea. At the beginning of the war in Ukraine, Russian forces acted to control the sea and even deny the use of the sea by Ukrainian forces. Due to the prolongation of the war in Ukraine, Russian naval forces began to erode, unable to sustain the war effort and even become targets. Following the assessment of the action of naval drones, Russian forces were most likely determined to place much greater emphasis on the near defense of ships, to act vigilantly for the employment of naval drones, to increase the safety area of combat ships against the shoreline, as well as to withdraw military vessels to the eastern Black Sea.

The naval tactics of the world's fleets in the maritime and river areas require urgent adaptation to this military phenomenon, naval drones, given the effects of the use of naval drones by non-state or state actors from the tactical level to the strategic level. The possibilities of using naval drones from simple platforms operating in a single operating environment to drones that can operate in multiple environments in support of means and combat forces or supported by other capabilities must also be explored.

### *Implications for Romania*

In Romania, critical maritime infrastructure is an important component of energy production, resource exploitation, power projection at sea or the maintenance of free maritime communication lines connected to international trade. At the heart of the critical maritime infrastructure in Romania, the Neptun Deep project will most likely be. A project for the exploitation of natural gas resources in the exclusive economic area of Romania interconnected with the impressive under water infrastructure for the transport of resources through the network of under water cables and pipes that will be created for the transport of gas to shore (OMVPETROM, 2025). In the face of this ambitious project, there are already many challenges. For example, in the summer of 2022, Russian ships approached the natural gas extraction platform "Ana", in a suspicious way, raising many questions about the future of the security of Black Sea platforms (Profit.ro, 2023). There are also some authors who highlight the possibility of using future autonomous surface vehicles (MAVs) and aerial drones (UAVs) in research or sabotage of underwater

infrastructure (Dumitrescu, 2025, pp. 6-7). On the other hand, there are some authors who believe that surface naval drones could be used to protect critical maritime infrastructure (Manailă, Dogaru, 2024).

Following the research carried out, failed kamikaze naval drones were identified or whose command and control was lost during the mission on the maritime communication lines in the Black Sea. For example, in the contiguous area of Romania was found a first failed naval drone (Dumitrache, 2024), but whose origin was not disclosed. According H.I. Sutton, a defence analyst and open source investigative reporter (OSINT), the identified boat was of American origin with a cargo of about 500 kg of Soviet production (Sutton, 2024). The second explosive-loaded kamikaze naval drone was found drifting off the coast of the district of Catalca, near Istanbul (Newdick, 2024). Moreover, on 01 October 2025, a failed kamikaze surface naval drone was found in eastern Turkey, near the city of Karshibasi (Altman, 2025). In this case, the Ukrainian naval drone of Magura V type was end owed with explosive charge or other types of weapons and ammunition. Mostlikely, following the recovery of the drone carefully by some Turkish fishermen, the Turkish authorities will examine in detail the drone found (War\_Noir, 2025). All these naval drones can have effects on the maritime communication lines in the Black Sea, implicitly on international trade, but also on the military fleets of the riparian countries that need to increase their vigilance, observation and close defense of the ships to counter the threat.

In the Black Sea, there are regional maritime patrol and surveillance initiatives to identify the threats of drifting mines on the critical maritime infrastructure of the countries Bulgaria, Turkey and Romania (Ministerul Apărării Naționale, 2024). Moreover, in the Black Sea, in terms of ensuring the protection of critical maritime infrastructure, there are several key elements that support each other from the presence of capabilities at sea, to information for defense and to the protection of cyberspace, with a role in avoiding communication paralysis and the deterioration of energy systems (Dumitrescu, pp. 20-22).

The naval tactics of the Romanian Naval Forces, most likely, should be adapted to new technologies, by equipping and integrating naval drones in the missions of the maritime and river component. Naval drones could be used in combat, from stand still, in hidden positions in the river area or in proximity to critical maritime infrastructure, from where to be operated to order against the capabilities of a possible enemy. Naval drones could also be used in combat, from mobile positions,

in an offensive way, either from the coast or launched from port-drone platforms or used in an ingenious way, to put real problems to a state superior technological and numerical aggressor.

## CONCLUSIONS

Our scientific approach, through online content analysis, applied to the phenomenon of naval drones in correlation with critical maritime infrastructure, answers the research question by identifying the possible effects of the use of naval drones on naval tactics.

The scientific paper has analyzed several bibliographic sources on the Internet in order to identify the impact of the use of naval drones on global tactics since 2022.

Following the study of the use of naval drones on tactics and implicitly on critical maritime infrastructure, in the three regions and in the more than 70 sites, a remarkable media impact coincided with the disclosure of the use of drones in support actions or in direct actions, a growing global search interest and an exponentially growing capability with the daily prolongation of the war in Ukraine.

The impact of the media is probably more spectacular, in the Black Sea region, because a war between two states that claim territories is ongoing, there are international implications and last but not least, the intervention of the Western states in the war in Ukraine amplifying the interest of searching for the topic researched in the online environment.

The wide spread use of drones in the Russian-Ukrainian war could be the result of technological evolution, the adaptation of the technique to meet the needs of war, as well as for the mutual damage of opponents, in particular the damage to critical maritime infrastructure.

The effects of the use of naval drones on tactics are diversified and highlighted in all operating environments, from suspicious actions without declared intention over a short period of time to maritime research actions over a long period of time, from actions in grey areas or international waters to actions in territorial waters, from passive actions to direct employment actions.

The naval tactics of the Romanian Naval Forces most likely require an improvement and adaptation of the mission execution, by using naval drones both in support of the Maritime Fleet and in support of the River Flotilla.

The Black Sea remains a hot space of military confrontations with countless challenges and threats for the critical maritime infrastructure in Romania

and implicitly for the Romanian Naval Forces, the Coast Guard or the Maritime Authorities.

In conclusion, naval drones through the possibilities of action and autonomy implemented by state or non-state actors in international waters or territorial waters can have considerable impact on naval tactics either in offensive actions or defensive actions.

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