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THE NEAR EARTH OBJECT THREAT: AN EFFECTIVE PUBLIC COMMUNICATION STRATEGY

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Near Earth Objects (NEOs) have periodically hit Earth throughout its history, and it is a fact that such impacts will continue to occur. Although the risk of serious collisions is extremely small, depending on the NEO size and impact point, the consequences could be catastrophic. Thanks to increased monitoring efforts, there is a high likelihood of spotting a NEO threat years in advance, potentially providing the opportunity for the international community to mitigate or even prevent the possible impact through timely actions. Being able to communicate these actions to the public, manage panic, and prepare for potential impact is critical. In September 2013, students and young professionals from around the world met in Beijing, China, for the annual Space Generation Congress (SGC). During SGC, the Society Working Group - sponsored by Secure World Foundation (SWF) and composed of 16 people from 10 different countries - discussed how the NEO threat could be best communicated to the public. Expanding upon the foundational work of UN Action Team 14 and SWF, the working group made several recommendations focused on defining an efficient communication and education plan, the role of the media, its benefits and dangers, and the necessary collaboration with emergency response officials and science communicators. This paper explores in detail these recommendations and categorizes them into temporal strategies - short, medium, and long term actions - depending on the estimated time of impact. With the long term strategy, the pre-impact timeline period is adequate for regional governments to produce local disaster management plans and coordinate education efforts with the media. With the medium term, while circulation of information is also important, these strategies prioritise the most critical issues while decision makers develop contingency plans based on proven disaster management methodologies. Finally, short term strategies rely on immediate actions to disseminate to the general public pre-existing natural calamity preparation and training information. We propose a "Mercalli-like" scale to be used for determining the impact effect and the respective actions to be taken to improve survivability. Recommendations also present practical and efficient educational programs to train and prepare the public and government for threats. The education proposal targets all parties involved providing at least a basic knowledge about the NEO threat, and attempts to explain the concept of impact prediction uncertainty, and how to communicate it in the appropriate context. We suggest using case studies to provide examples of the application of the communication and education programs proposed.

I. INTRODUCTION

Near-Earth Objects (NEOs) are comets and asteroids that have been moved by the gravitational attraction of bigger celestial bodies into orbits that allow them to pass close to the Earth's orbit. Comets are composed mostly of water ice with embedded

dust particles while asteroids have different composition, and they are believed to be what is left over from the initial agglomeration of the inner planets - Mercury, Venus, Earth, and Mars¹.

NEOs have periodically hit Earth throughout its history and it is a scientific fact that such impacts will

happen again. Most recently, a space rock exploded over the Russian city of Chelyabinsk creating a blast wave event that lightly damaged many buildings and injured about a thousand people². Before that, the most famous witnessed impact was the Tunguska event in 1908, in which an asteroid or small comet exploded over a deserted region in Siberia. Such an explosion is capable of destroying a large metropolitan area³. Although the risk of collision between a NEO and Earth is extremely small, depending on the NEO size and impact point, the consequences could be catastrophic. However, thanks to a general increasing effort in monitoring the solar system, there is a high likelihood to spot a NEO threat years in advance, potentially leaving the opportunity to mitigate or even prevent the possible impact through timely actions. This combination of a potential catastrophic event, predictability and opportunity to intervene drove the international community to start thinking about a coordinated response to the NEO threat.

II. HISTORY OF ACTION TEAM 14 AND IAWN

The Committee on the Peaceful Uses of Outer Space (UN COPUOS) in response to recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) established the Action Team on Near-Earth Objects (AT-14 or Action Team 14) in 2001.

AT-14 did not have only review the content, structure and organization of ongoing efforts in the field of NEOs, but also identified where additional coordination was required and made proposals to foster the international coordination in collaboration with specialized institutions and organisations.

AT-14 produced annual reports submitted to the Member States active in NEO work and set up recommendations concerning an international response to the NEO impact threat through workshops and conferences conducted with the international community. Since the AT-14 establishment, a number of activities and conferences have followed, highlighting the importance of preparing for future NEO threats. In 2008, AT-14, following the recommendations of the Association of Space Explorers (ASE), first proposed the creation of a series of organisational bodies to address the NEO threat effectively⁴.

In 2013, the UN formally endorsed the establishment of the International Asteroid Warning Network (IAWN) and the Space Mission Planning Advisory Group (SMPAG). While SMPAG will deal with the responsibilities of laying out the framework, timeline and options for engaging and executing

space mission response activities, IAWN is made up of scientists, observatories and space agencies around the planet to discover, monitor, and physically characterize the potentially hazardous NEO population. The group will also act a global portal serving as the international focal point for accurate and validated information on NEO⁵.

During the first meeting of IAWN steering committee, held on January 2014, in Cambridge, Massachusetts, strategies was recognized to develop public information strategies, plans and protocols relating to potential NEO impacts and their consequences. These will turn in helping the implementation of best practices for effective international NEO communications⁶.

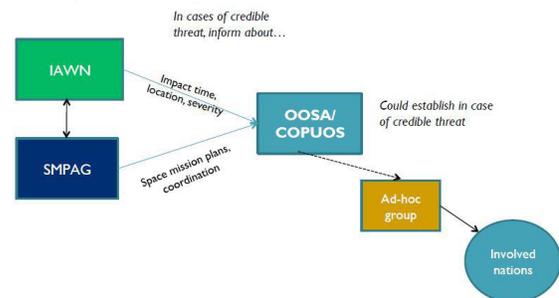


Fig. 1: Outline of how IAWN could interface with other UN bodies⁷.

III. SPACE GENERATION CONGRESS 2013

The Space Generation Congress (SGC) is the annual meeting of the Space Generation Advisory Council in Support of the United Nations Programme on Space Applications. Participants are top university students and young professionals with a passion for space. SGAC aims to hone and promote the voice of the next generation of space sector leaders on topics relating to international space development. The three days of SGC 2013 brought both young and experienced students as well as professionals in the space sector together for an inspiring and resourceful engagement with their peers. In 2013, the event was hosted at the Beihang University, in Beijing, China from 19 to 21 September. The congress took place days prior to the 64th International Astronautical Congress (IAC) and was attended by 116 delegates from over 58 countries. Delegates were exposed to perspectives on space issues from the world's leading space organisations, including: the International Astronautical Federation (IAF), National Aeronautics and Space Administration (NASA), and the United Nations Committee on the Peaceful Uses of Outer

Space (UN COPUOS). Similarly, leaders from these space organisations had the opportunity to learn of fresh, innovative and bold perspectives from the incoming space generation on the five main themes of SGC 2013: Industry, Agency, Society, Exploration and Earth Observation.

III.I Space Generation Congress: Society Working Group

The Society Working Group discussed how nations and international organization can efficiently inform population in case of NEO threat. In addition, it also discussed how current media help (or not) in this endeavor. The working group based its discussion on the report submitted by the AT-14 at the UN COPUOS and on SWF's paper titled "Crafting an effective communications plan for an international response to a threatening Near Earth Object". In order to recommend an efficient delivery of NEO threat information, the working group addressed in particular four main issues:

- How to define an effective communication plan to prepare governments and public to effectively respond to the potentially hazardous NEO
- How to implement a coordinated programme of education targeting the public, policy makers, students and media.
- How to define criteria to identify communicators to be used to deliver NEO threat information effectively and avoiding misinformation.
- How to access NEO Research data and real-time information

The working group, although acknowledging the work carried out by AT-14 and endorsing their recommendations to support the development of the IAWN and SMPAG, came up with some new general recommendations regarding the implementation of an effective communication and education plan.

III.II Recommendations

The recommendations coming from SGC are presented in this chapter. The analysis is then carried out more extensively in the next sections. The group presented the following recommendations⁸:

Recommendation 1

Effective communication plans should foresee long, medium and short-term actions to cope with the NEO threat at different stages. Long-term action will target the general public in order to raise awareness and foster scientific education. At this stage, the plan

should be implemented by local governments in accordance to the guidelines provided by IAWN. Medium-term actions will require decision-makers to develop contingency plans in the remote case of a highly probable impact. Short-term actions will directly target general public and governments using the preparation and training learned with medium/long-term communication strategies in order to mitigate the consequences of threats. The group also recommended implementing new tools in order to directly connect the NEO threat to a procedure to be executed on the ground in order to mitigate the risk.

Recommendation 2

In order to produce an effective educational plan, it should be implemented as a multi-level strategy addressing in different ways the population with correct and factual information. It should be implemented as a "media training" with the support of universities, agencies and institutes, in order to produce NEO threats related, TV-series, movies, advertisements and other similar media, with the guarantee of factual correctness of the material presented. Accredited organisations and international groups would aid policy makers in responding to a NEO threat and its possible consequences. In addition, schools, museums, planetariums and virtual forums should play an important role in the education of students and general public. Where the general public could not access these kinds of activities, the group recommended to get NGOs involved in contributing to the process through community gatherings and other tools already in place for other kind of emergencies.

Recommendation 3

Taking into account the differences between nations and their available infrastructure, every nation should identify possible communicators and implement impact risk management within its own emergency service unit(s). Emergency responders should be educated on the specific threats of asteroid impacts. The group recognized the importance of an Impact Disaster Planning Advisory Group (IDPAG) functioning under the SMPAG to coordinate international activities and to support national efforts. In the initial phases, national emergency service units should contact and receive information from a central coordinating body. In the event of a short-term threat, the emergency service units should also start an awareness campaign to inform the public of the threat and about the possible mitigation measures. As a long-term response, IAWN should act as a central body for any information and international communications between countries.

Additional Recommendation

We recommended to implement a new scale in order to directly connect the NEO threat to a procedure to be executed on the ground in order to mitigate the risk. An example of such tools could be a disaster assessment scale describing effects of NEO impact similar to the Mercalli scale for earthquakes.

Since an asteroid event may threaten more than one nation, effective plans must come up with an international agreement on data sharing, emergency aids and collaboration. It is fundamental for countries that might not be affected by the asteroid event to collaborate and cooperate with countries in danger, specifically in cases where the assisting country is a space power.

IV. COMMUNICATION PLAN

This section addresses how we propose to inform the public about a NEO event. The approach chosen is separated in three distinct efforts focussing on the different timescales related to a threat.

The short term represents the period in which there is an imminent threat. The aim is to inform people about the danger they are in and which actions need to be taken by them.

The medium term represents the time after the discovery of an object with a higher than normal likelihood of colliding with earth. The approach is to inform the people of the steps that are taken and of the potential consequences.

The long term represents the continuous effort to educate people on the NEO threat. The overall approach is to educate people on what NEOs are and what we do and do not know about them.

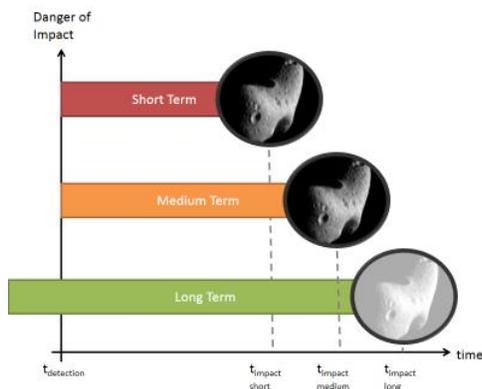


Fig. 2: Timescale of a NEO event.

IV.I Short Term

The short-term plan focuses on an imminent threat to a particular region. The response should be immediate evacuations and/or protection, prioritizing the preservation of life. This scenario is characterized by a short window of time until the impact with a considerable population size that has little or no information regarding NEOs and emergency procedures for impact. In order to prepare for the worst case, the damages to properties and life in this scenario are considered extensive. Moreover, communication tools are considered prone to failure and subject to overload due to large use.

Given the short time for the information dissemination and posterior action, panic and riots can arise. The uninformed population may question the veracity of the information and, due to that, not cooperate or even prevent the actions of others and the emergency services. Moreover, evacuation ways maybe blocked by the heavy traffic or even blocked on purpose by opportunistic people to rob or charge the escapees. In emergency situations like this it is very common that people try to contact their relatives and friends with this large communication flux phone lines and internet may overload or failure. The media, for lack of understanding the issue or for taking advantage of the situation, may transmit inaccurate or false details and instructions.

The key points identified for a successful preservation of lives in the short-term scenario are: communication, security and immediate action. The short-term plan should directly target the general public and local government using the preparation and training learned through the medium/ long-term communication. Clear and simple messages with precise and rapid instructions should be immediately advertise to the general population using all possible media communication tools available. The communication should not rely only on the traditional and massive tools, but also on local and emergency channels. The instructions should focus on the actions that the individuals should take and also places they should proceed, such as, community shelters and rendezvous points for evacuation. The government should ensure the people that all measures are been taken to evacuate everybody and specify where each group of refugees are heading to, which helps to avoid mass panic and communication overload. In order to avoid problems related to security the governments are advised to dispatch the security services that will also assist in the evacuation procedures and shelter instructions. A simple, direct, clear and comprehensive “one-page” manual and information should be prepared in order to give quick and clear instructions to the people affected by the threat.

In case of large impact neighboring nations are encouraged to help with logistic and personnel allowing a fast and smooth flow of refugees, providing assistance and material means for their survival. The foreign nations are also encouraged to provide specialists who will help in the evacuation, shelter and security.

IV.II Medium Term

The medium term strategy aims to inform the general public about a NEO threat in a period of time which is neither immediate nor too long. Panic is not the main feature in this scenario, because the threat is not imminent, but general public must be informed that there is a probable danger. The main feature is how to inform population in the right way on preventative measures and actions to take in case of an impact.

In order to avoid hysteria, nations must effort to reassure the population, providing information regarding the threat and how it will be prevented, by using media and encouraging scientist and experts talk about it on local and national televisions: they should be very encouraging and they must exhort people not to underestimate the threat in case a collision will not happen, otherwise the population might not believe the institution for future threats.

In this way, making the general public aware of the NEO threat in a way which is neither shocking nor summary, panic will be avoided. Furthermore, in case the NEO will not actually impact on Earth, the general public will be quite prepared and it will give more likely the right importance to next threats.

IV.III Long Term

The aim for the long term strategy is twofold, Institutions and nations need to be prepared for an NEO emergency event and the general public needs to be educated about NEOs. Governments and institutions need to be informed because then they will be better prepared to react effectively to a NEO threat event. International organisations should provide information to governments so they can produce a local disaster management plan in agreement with the guidelines provided by the IAWN and based on their own emergency response infrastructure. It is advised that the governments elect national points of contact, such that in the case of an emergency there is an international network in place to exchange information and support each other in the emergency effort. This long term approach will provide a solid basis for a response and will likely consolidate a reaction to an NEO emergency event in national policy.

The aim of the education of the general public is to make them aware of the existence of NEOs and the

potential threat they pose. Additionally it should prepare the public for the actions to be taken in case of an emergency and secure that the spread of false information is minimized. We believe that once the public is well informed about NEOs, the impact of fear mongers is minimized.

In order to fulfil this aim we advise that governments include information on asteroids and NEOs in their science curriculum. This could be supported if institutions and organisations involved in these subjects make educational material freely available. While information is the prime need, this effort could greatly benefit from setting up traveling exhibitions and supporting schools, planetariums and observatories with exhibition materials, such as meteor fragments. It is of the utmost importance that the youth is well educated on the subject, they are not only the future generation but also both impact their own parents and educate the next generation.

We advise governments to support the production of documentaries and to support media producers to truthfully depict NEO and asteroid impacts. In addition governments could support and educate science communicators to tell about NEOs. They could help inform the media and make sure reliable information is being spread at all times. The high uncertainty of asteroid events, makes it likely that false information is spread and that the public loses trust in the official institutions.

Huge asteroid to wipe out life on earth



2 days ago

SHARE 344 TWEET 9 EMAIL

Researchers at the University of Tennessee have discovered a gigantic asteroid, 1950 DA, that is hurtling towards Earth, and – if it hits – will cause massive tsunamis and climate change set to end life as we know it.

The asteroid, which has a diameter of over a kilometre long, is hurtling towards us at nine miles a second and rotates every two hours and six minutes – a speed thought impossible by scientists as spin that fast should cause it to disintegrate. However, cohesive forces – known as van der Waals – are holding it together.

With the chances of the object hitting earth calculated at one in 300, scientists believe that blowing up the asteroid would actually cause greater problems than an apocalypse, as that action could result in several massive impacts.

The asteroid is expected to impact in mid-March 2880.

Figure 3: Example taken from MSN UK of how NEO news should NOT be treated⁹

Informing the media and putting them in time in contact with scientist and the proper communicators can provide a solid basis for the spread of correct information. In this time of a relative low threat, it is important that the media and communicators use related events, such as meteor showers and close passes, to inform the public about NEOs and asteroids.

V. EDUCATION PROGRAM

Whether threat is due in the short, medium, or long term, an education program will need to be

undertaken in order to inform the public of essential facts on Near Earth Objects and the threat they pose. This will be essential in order to prevent the spread of false information, fear-mongering, and provide the population with the competency to understand and discuss the threat in an informed manner in a dynamic environment. The key topics necessary include (a) basics of NEO science; (b) history of NEOs and Earth; (c) basic tutorials on risk; (d) emergency preparation; and (e) directions to reliable information sources.

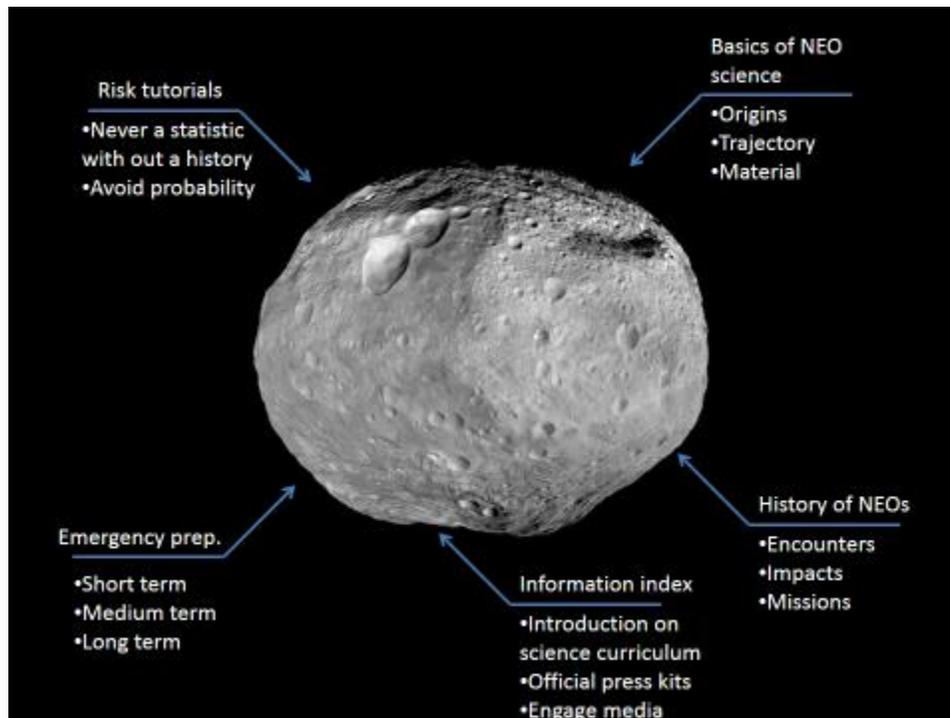


Fig. 4: Educational Program: basic education.

V.I Basics of NEO science

Where do NEOs come from? How did they get here? What are they made of? Questions like these are important to have answers to, for they help make the threat tangible, reducing it from a mystery to a scientific reality, thus mitigating some of the fear and uncertainty. There are several ways to provide and distribute this information, including but not limited to: encouraging science curriculum in schools; providing official press kits to news television shows; engaging popular science communicators (e.g. Neil deGrasse Tyson and Bill Nye the Science Guy) to make official television appearances and write opinion editorials in popular television, web, and print media; free local museum exhibits; traveling exhibits where the public can talk to a NEO expert and even touch meteorites; neighborhood “ask a NEO

expert” town-hall meetings; free pamphlets mailed to the public or distributed at popular destinations such as grocery stores, schools, and shopping complexes.

V.II History of NEOs and Earth

It is important for the public to understand the variety of encounters NEOs have had over the course of Earth’s history, ranging from extinction impacts, to Tunguska, to Chelyabinsk. It is also beneficial for them to understand what scientists, engineers, and governments are doing about it. This includes introductions to projects such as Action Team 14, explanations of whatever space-based missions may be ongoing or in the works (e.g., B6-12 Foundation, NASA Asteroid Re-Direct Mission), and an invitation to join the citizen scientists who are identifying,

counting, and cataloging the NEOs neighboring Earth.

V.III Risk Tutorials

One of the more difficult concepts to explain the lay audiences is the concept of risk and statistical probability. Statistically the risk of impact fatalities is high; however, the expectation of death due to impact within ones lifetime is very small¹⁰. This paper deals with the event of both high-impact low-probability (HILP) and high-impact high-probability NEO events, which are even further complicated by the possibility of long, medium, and short-term encounters--all of which make this type of risk communication extremely complex. Percentages and probabilities are very difficult for people to understand--and reliance on them alone should be avoided when communicating with the public. "Never a statistic without a story," should be the rule of thumb, providing context to numbers. In addition, return period/recurrence intervals are easier to contextualize than are probabilities. However, it is essential to explain that, for example, "on average an encounter should be expected every 100 years," so that the population understands that if 100 years passes without an encounter, it does not necessarily mean the scientists are wrong--or that an encounter will happen on day 101. In addition, if the probability of impact is widely uncertain, proving cautious but confident information will be important, so that the public neither exaggerates nor underestimates the threat.

V.IV Emergency Preparation

These temporal distinctions between short, medium, and long term NEO threats will require two separate approaches: (1) a warning to produce an emergency response (short-term imminent threat), and (2) a hazard awareness program to produce long-term hazard adjustments. Similar to earthquake, tornado, fire, tsunami, nuclear, and other emergency drills, it will be critical that the population be well versed in the steps to take in the event of an alert. Depending on the temporal nature of the event, this includes instructions on how to take cover, avoiding windows and other shatter-prone objects, evacuation procedures and meeting points, food and water storage/transport tips, generally safe locations, generally dangerous locations. Many of emergency training measures can be borrowed and modified from other disaster training protocols, and in fact, experts from these agencies should be on staff to help develop the plans. Emergency preparation and response actions should be associated with their respective Torino Scale impact.

Table 1: Emergency response situations

Timeline	IAWN Actions	General Actions
Short-Term	Warning	Depending on approved scale impact
Long-Term / Medium-Term	Hazard awareness program	Emergency drills

V.V Information Index

There will be many different voices out there providing competing and false information. Some of this false information may incite undue panic, other information may result in the threat not being taken seriously enough. Given the natural distrust many people can sometimes feel for government and scientists, a collaborative, cohesive, and consistent narrative is critical. All official communicators must be on the same page, which means seamless networks of conversation must be implemented, and leaks in the chain must not occur--for without the appropriate context, the information can be misinterpreted, control of the message lost, and confidence in the official communicators lost with it. A culture of transparency should be in place, as well; if bloggers, journalists, celebrities, and other informal authority figures sense they officials have something to hide, the public's confidence will be shaken, and they will be more susceptible to fringe ideas and conspiracy theories. Therefore, there will need to be an easily accessible, frequently updated information source that will point the public to the single most accurate and relevant information on the NEO threat. This should be the one-stop-shop for links to credible resources as well as misinformation sources that should be avoided. This should include plainly written easy to understand educational materials and updates, high quality educational materials such as animations, articles, and infographics, phone numbers to local scientists and emergency authorities, etc. In communities with high speed internet access, this can be a website; in other communities, this can be transmitted via radio or whatever primary information pipeline the public is currently accessing. For rural, geographically hard to reach, and very low income communities in developing countries, partnering with NGOs who are already working locally in these areas on issues that require education (e.g. UNICEF and

maternal and child health, PEPFAR and HIV/AIDS) can help authorities more effectively distribute materials.

VI. CASE STUDY

The recommendations and plans discussed in the previous chapters could be best understood if compared to a case study in which practical examples are used to explain the implementation of the communication and education strategy. In order to define a case study, it has been decided to consider asteroid 99942 Apophis¹¹. The media coverage that this asteroid had in the past makes it a good candidate.

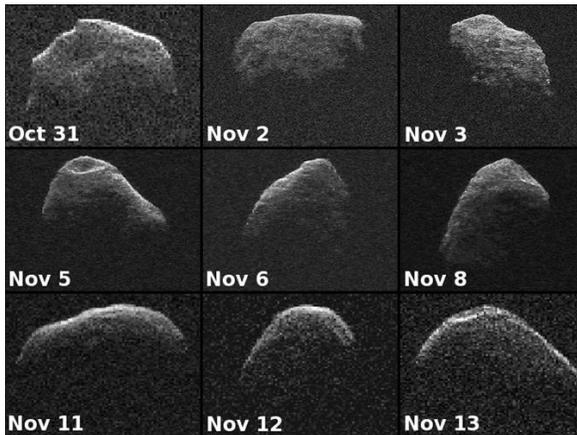


Fig. 5: Nine new radar images of near-Earth asteroid 2007 PA8 were obtained between Oct. 31 and Nov. 13, 2012. Image credit: NASA/JPL-Caltech

For our case study, it has been considered a “*What if*” situation, assuming that the 2013 observations by ESA’s Herschel Space Observatory¹² would have confirmed instead a possible impact between Earth and Apophis in 2036 and the risk would rise in the Torino Scale¹³ up to 5. In such case, considering there would be still 23 years before the expected collision, the NEO communication plan would still apply the long and medium term recommendations. The 300-meter wide asteroid would cause regional destructions with casualties in the order of millions¹⁴. With 23 years still to pass before the impact, it is important not only that governments start creating interfaces to effectively operate with the IAWN and collectively with other emergency disaster response infrastructures but also that they put in place the communication and education plan recommended. Communication and transparency is fundamental at this stage to not jeopardize any future effort. Global economy at this stage would not be probably much affected but there will be the rise of movements of opinion, fueled by religion, conspiracy theories, economic lobbies or

simply ignorance, opposing an early preparation for the event. Therefore, the long term is the most critical moment, in order to be able to put in place the prevention measures. The public opinion is fundamental in order to get governments’ support and thus funding needed to conduct research and prepare a deflection mission.

Sixteen years later, in 2029, new observations during Apophis’ close passage are able to determine that the impact will surely take place in 2036. At this point, the news will probably create a general panic that could only be mitigated by the application of the recommendations proposed for long and medium term. With a probable global economic crisis on the verge of happening, a deflection mission should be already in place to have any chance. At this stage, it will be probably possible to know the path of risk where 99942 Apophis will have chance of impacting Earth in 2036. Actions will need to be taken to move and relocate the population from those areas before the impact take place. These actions cannot be improvised and would have needed a careful preparation to avoid humanitarian disasters and in order for these actions to be more effective as possible, a clear and simple communication is needed, where the subject is not anymore the asteroid but its effects on the ground. As part of this research on a more direct communication for a short-term situation, our team proposes the creation of a new scale to measure the effect on ground of a NEO impact, with also basic information on actions to mitigate risks.

VI. ASTEROID INTENSITY SCALE

Currently, to quantify the likelihood and the energy of an asteroid’s impact, two scales are used: the Torino scale and the Palermo Technical Impact Hazard Scale. The Torino Scale is a method for categorizing the impact hazard and it is intended as a tool for astronomers and to assess the seriousness of collision predictions, by combining probability statistics and known kinetic damage potentials into a single threat value. The Palermo Scale is a similar, but more complex scale¹⁵.

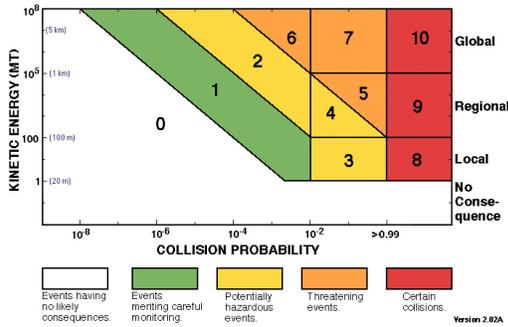


Figure 6: The Torino Scale, created by Professor Richard P. Binzel with the Massachusetts Institute of Technology (MIT) ¹⁶.

The position uncertainty of an asteroid is usually relatively small over the time span of the observations, but it usually grows, or stretches, as the object's position is predicted farther and farther into the future.

Although these scales are an amazing tool to give clear information even to non-experts, they may encounter some problems in informing the general public about the consequences of the impact and the actions that need to be taken in order to mitigate the risks. Therefore, we came up with the idea of a different scale that takes in consideration only the actual effect on ground and possibly some mitigation actions to take in order to protect as many lives as possible. The inspiration for such scale came from the Mercalli intensity scale for earthquakes. The Mercalli intensity scale is a seismic scale used for measuring the effects of an earthquake, and it is distinct from the Richter scale, which is a measure of the energy released.

Such NEO Intensity Scale (NIS) should deal not only with the magnitude of the event, but also with the position on the globe and the consequent population density and building structure. Therefore, the NIS would enter in action only if the impact is certain (position 8, 9 and 10 of the Torino scale) and when the asteroid impact path on the globe is known. NIS would easily map the risk around the impact path of the asteroid, providing useful information in order to avoid a worldwide panic. Future works will develop such scale, also taking in consideration other emergency scales and studies.

VII. CONCLUSIONS

The recent alarms with asteroid 1950 DA has shown that traditional and non-traditional media has not ready and a communication plan is required to

mitigate the effects on the public of future NEO threats. Although alarmist and mostly wrong, news are always corrected by a precise science community, it is not enough to prevent a widespread and erratic perception of NEOs.

This paper proposes the establishment of an international network of cooperating international and national emergency services, such that communications lines are in place before they are needed. Communication of the NEO threat can be categorized in three select timescales; short, medium and long term. This paper recommends the construction of an NEO Intensity Scale (NIS), which is based on the consequences of an impact.

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