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MEDICAL SCIENCES



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Ethics of environmental research in the context of climate change: the case of the 2019 flood in Aq Qala, Iran

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**Global Forum on
Bioethics in Research**

Holiday trip to Golestan province and nature walk



Global Forum on Bioethics in Research

Visiting Gorgan river and Aq Qala town





2D numerical simulation of urban floods using CCHE2D (case study: Aghghala City)

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Publication date 2018/2/20

Journal Iranian journal of Marine technology

Volume 4

Issue 4



شبیه‌سازی دوبعدی جریان‌های سیلابی شهری با مدل CCHE2D (مطالعه موردی: شهر آق‌قلا)

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چکیده

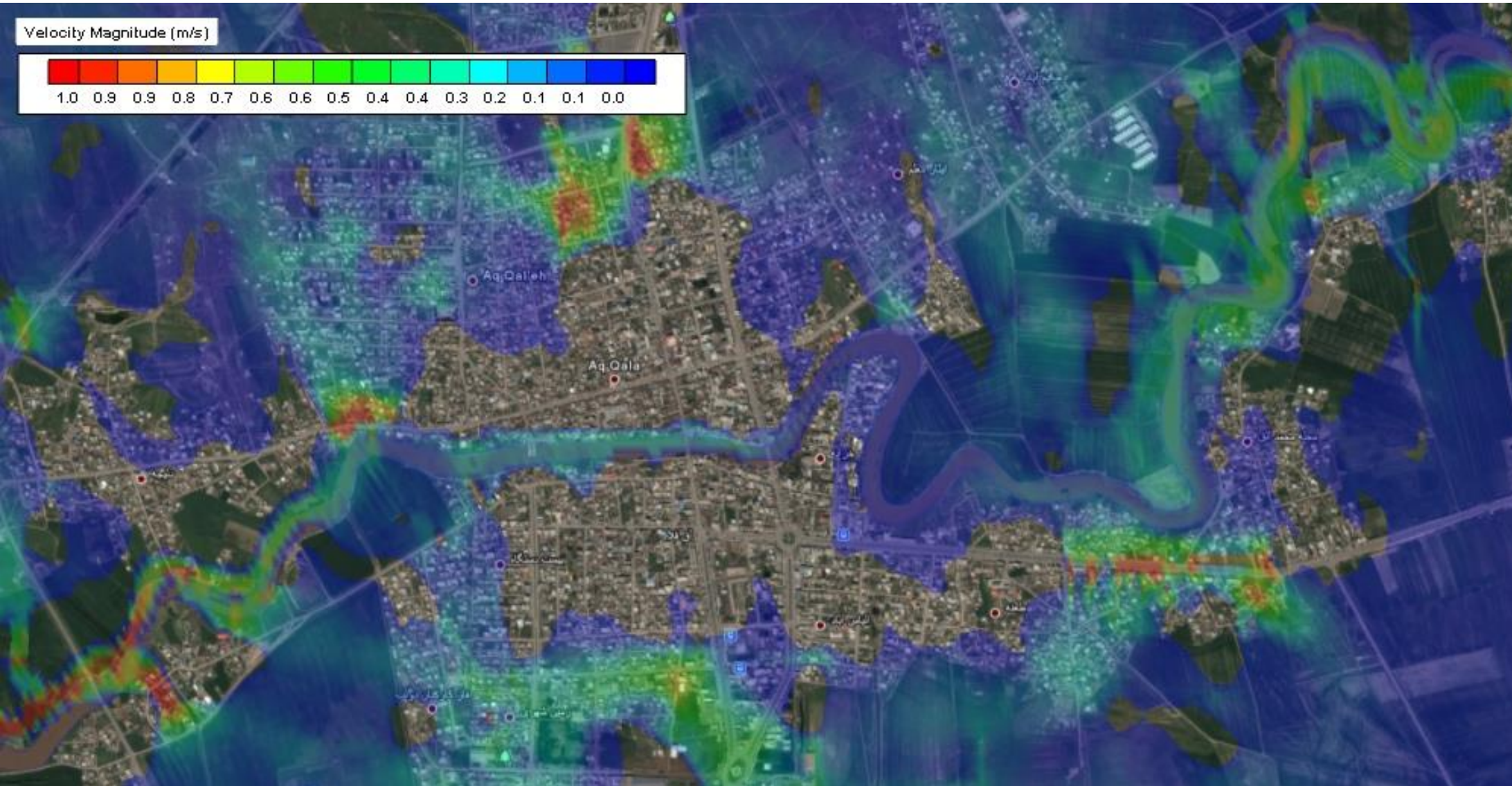
مردم در سراسر جهان همه روزه با وقایعی روبرو می‌شوند که منجر به مرگ، آسیب، تخریب اموال و اختلال در فعالیت‌های روزانه می‌شود. سیل نیز به عنوان یکی از مخاطرات طبیعی از دیرباز جوامع روستایی و شهری را مورد تهدید و هجوم قرار داده است و جوامع شهری فارغ از هرگونه پیشرفت در زمینه‌های مختلف همواره دغدغه‌ی تهدیدات سیلاب را به عنوان چالشی بزرگ پیش رو داشته‌اند. با توجه به مسائل مطرح شده توجه ویژه به مبحث مدیریت بحران سیلاب در تعامل با سایر دانش‌ها و علوم بنیادین و کاربردی امری اجتناب ناپذیر می‌نماید. در این تحقیق با استفاده از نرم افزار CCHE2D به بررسی بازتاب رفتار هیدرولیکی شهر آق قلا در برخورد با سیلاب‌های ۱۰۰ ساله رودخانه‌ی گرگان‌رود پرداخته شده و با استفاده از شاخص مخاطره ورودی لازم برای تدوین برنامه واکنش سریع، مدیریت بحران، بیمه سیلاب استخراج گردیده است. نتایج حاکی از آن می‌باشد که با توجه به الگوی جریان شکل گرفته در سیلاب مذکور و نقشه‌های شاخص

- Analysed flood risks in the Aq Qala region.
- Recommended sustainable urban planning, infrastructure improvements, identification of risk areas, and ensuring accessibility and the necessity of evacuation.

Total citations Cited by 4



The paper predicted high velocity of water in case of flood



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The paper predicted high discharge rate of flood water

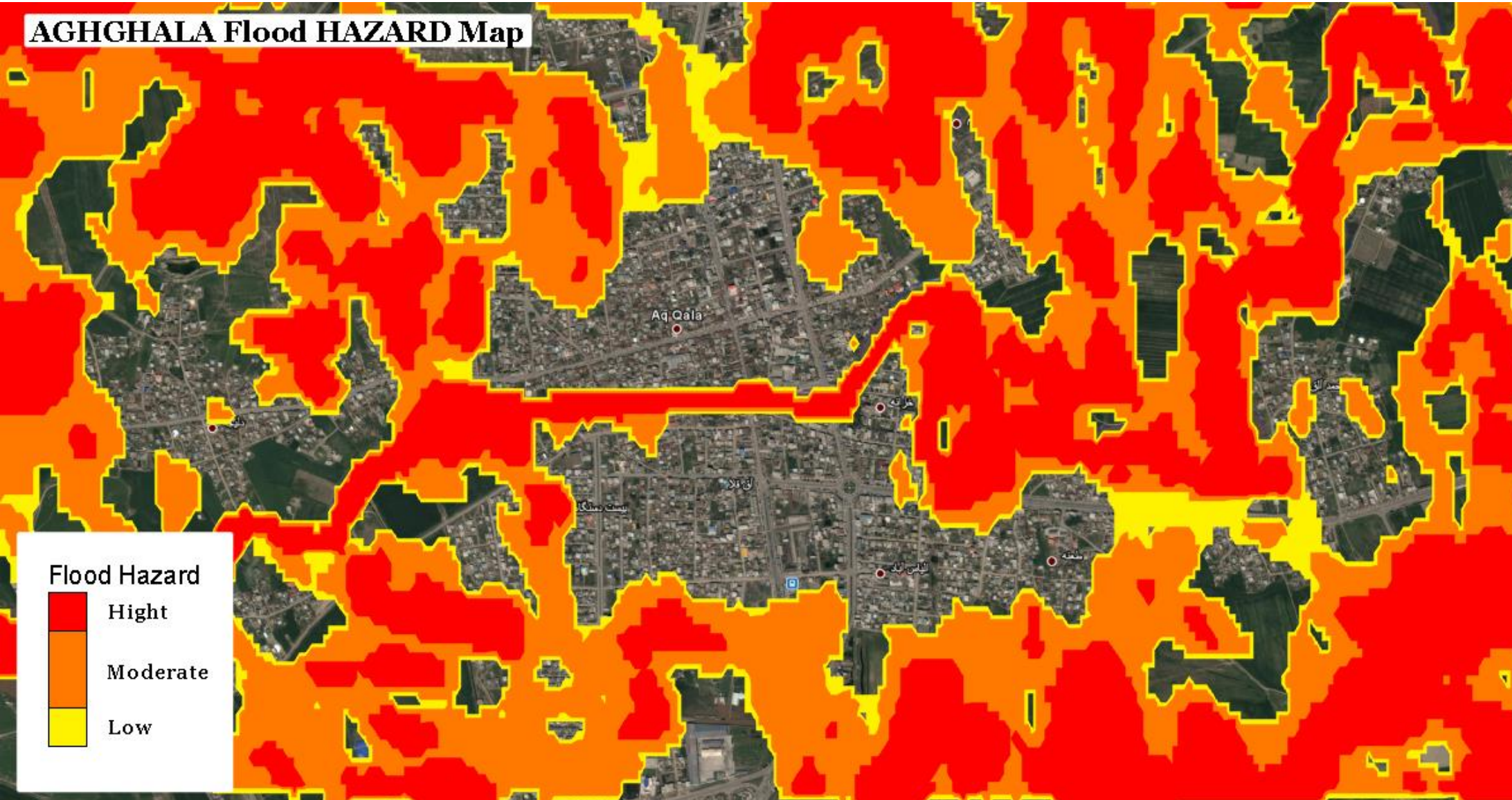


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The paper predicted dangerous levels of flood hazard



AGHGHALA Flood HAZARD Map



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Aq Qala city after the flood, March 2019: Nightmares come true!



- 300 mm of rain in 48 hours
- 13 people died
- 270,000 hectares of agriculture
- 12000 houses
- Total damage 500 million \$



کتابخانه
Photo: M.Amin Peykhanlou

The pressing question:



Although the paper's findings could have guided local authorities

Why did local authorities not pay attention to this research?

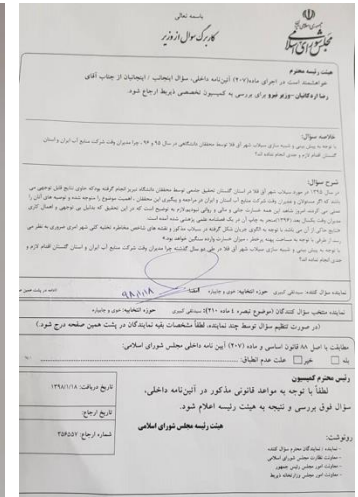
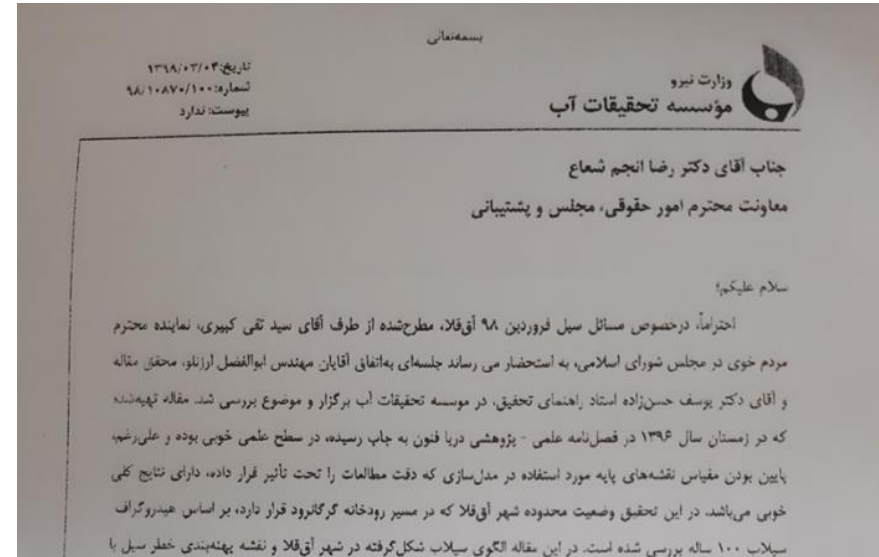
This case addresses this question from an ethical point of view.



One example of a high-level political response to the question:



- The Minister of Energy was called to parliament.
- The Water Research Institute notes that findings were not shared directly with relevant authorities.
- WRI calls for targeted strategies to integrate insights from such academic publications.



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Theme 1: Ethical implication for [local] funding agencies' role:



- **Critical issue:** Who gets to ask questions shapes impact.
- **Investigator-initiated projects:** Often isolated; results less absorbed.
- **Local funding:** Increases impact on local decision-making.
- **Sponsored research:** More likely to be utilized effectively.
- **Funding agencies:** Connect research providers with end users.
- **Ethical implication:** Efficient resource use and community engagement



Theme 2: Participatory research, collaborative partnership and engagement of local communities and related authorities:



- **Fundamental Issue:** Lack of engagement with local communities and authorities.
- **Aq Qala's Study:** Does not include these elements.
- **Local Authorities:** Refused to cooperate with the project.
- **Researchers:** Lacked education and sensitivity on these issues.
- **Other Research Fields than Biomedicine:** Insufficient recognition of these elements.



Theme 3: Need for a holistic approach to health:



- **One-health and planetary health:** Manifestation of the interconnectedness of the health of animals, plants and humans and the new DoH-2024
- **A related example:** antibiotic resistance could be exacerbated by the flood.
- **Expanding the scope of the current research ethics frameworks to other health-related fields:** e.g., substantive (as community engagement) and procedural content (as ethical review), to research studies with a significant environmental impact.



Theme 4: Improving the social value of research by facilitating its translation to policy or action:



- **Tangible social value of research:** Need for translating findings into policies and actions.
- **Examples of translation:** Sensitizing policymakers to available scientific evidence/ advocacy for the procedural value of evidence-based decision-making
- **A valid question:** The scope of researchers' responsibility for disseminating the results to related communities and authorities



This case study underscores the significance of:



- **Specification of research ethics standards for climate change and environmental research** to avoid isolation of the findings from public and policymaker attention that impedes practical application
- **Applying research ethics standards for climate change and environmental research** including procedural (e.g., ethical review process) and substantive (community engagement and collaborative partnership).
- **Understanding the collective responsibility for ensuring the ethical conduct of research** that extends beyond just the researchers and includes funding agencies, research governance bodies, academic institutions, scientific journals, and other stakeholders.



- **GFBR Program**
- **Dr. Abolfazl Arzanlou:** who conducted the original study and provided very valuable input and information for this case study to be compiled.
- **Esteemed reviewers** whose input was extremely helpful and constructive:
 - ❖ Ross Upshur
 - ❖ Cheryl MacPherson
 - ❖ Adrienne Ruth Sayer

