



Naruto whirlpools on 17 October 2001 - Street of vortices with a freighter in the background, view from the bridge during the ebb

Whirlpools. Experiencing Naruto Whirlpools

Dr. Hubert Chanson writes on the fascinating topic of whirlpools with a special focus on the Naruto Strait Whirlpools.

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Call for nominations

13th Arthur Thomas Ippen Award

For outstanding accomplishment in hydraulic engineering and research

12th Harold Jan Schoemaker Award

For the most outstanding paper in the Journal of Hydraulic Research

John F. Kennedy Student Paper Competition

Invitation To Participate In The John F. Kennedy Student Paper Competition during The 30th IAHR Biennial Congress, Thessaloniki, Greece 24-29 August 2003.

Find more details about the founding statement and rules of these IAHR Awards on page 19

Convocation 2002 General Members Assembly

All IAHR members are cordially invited to attend the IAHR General Members Assembly which will be held on July 5th, 2002 in Cardiff, UK.

Venue: Cardiff University

Time: 14:00 – 15:00

AGENDA

- Opening
- Announcements
- Minutes of the 2001 General Members Assembly, September 21st, 2001, Beijing, China (published in Issue 1, 2002)
- 2001 Financial Report
- 2001 Annual Report Association Activities
- Any Other Business
- Closure

The Role of Practitioners

This article by Prof. Jean Jacques Peters is based on a presentation made at the International Colloquium "Knowledge Transfer for Environment Water" organised in Delft, The Netherlands in June 2001 as part of the EU ETNET 21 project. This text analyses the gap between education, research and practice in the water-field and the difficulties in bridging this gap.

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View of Puerto Villaroel harbour, on a meander loop of the Ichilo river, Bolivian Amazon region.



wide range of initiatives. Again, to name but a few, NWRI is involved in planning the sixth phase of the UNESCO International Hydrological Programme, 2002-2007, a NATO Advanced Workshop on Urban Water Management, the UNESCO Intergovernmental Oceanographic Commission, the Arctic Monitoring and Assessment Programme (AMAP), and an OECD initiative on

endocrine disruptors. Researchers and research managers also have collaborative projects with numerous universities and research institutes in North America, Europe and around the world. And of course, there is the long-standing involvement with IAHR – with whom NWRI staff and management look forward to many more years of fruitful co-operation. For more information on the National

Water Research Institute and its staff, visit the website at www.cciw.ca/nwri

*Jiri Marsalek,
Project Leader, Urban Water Management,
NWRI
Secretary IAHR –IWA Joint Committee on
Urban Drainage*

Whirlpools. Experiencing Naruto Whirlpools

By H. Chanson

*Reader, Environmental Fluid Mechanics,
Department of Civil Engineering, The
University of Queensland,
Brisbane QLD 4072, Australia
Email: h.chanson@mailbox.uq.edu.au - Url
: <http://www.uq.edu.au/~e2hchans/>*

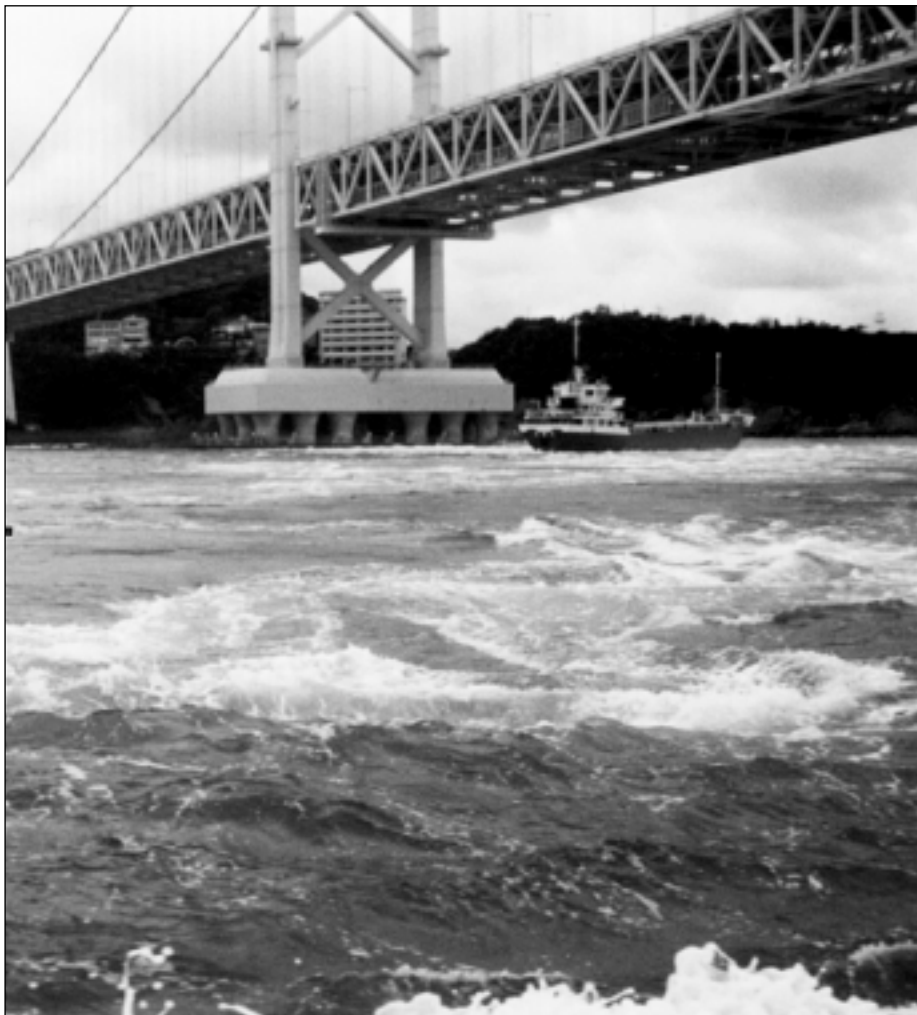
The Merriam-Webster's Collegiate

Dictionary states that a whirlpool is “water moving rapidly in a circle so as to produce a depression in the centre into which floating objects may be drawn”. Basically a whirlpool is a vortex of vertical axis, with a downward velocity component near its centre. A good example is the bathtub vortex [1]. In coastal zones, whirlpools are produced by the interaction of rising and

falling tides. They are often observed at the edges of straits with large tidal currents (Table 1). The vortex (whirlpool) is a coherent structure typical of shear flows where there is a velocity difference across the shear layer. It affects the surrounding flow and water can be seen going back and forth across the shear layer between vortices.

Whirlpools are sometimes called Maelstrom, after the Norwegian current. The Maelstrøm is a strong tidal current of the Norwegian Sea in the Lofoten islands [2]. Flowing between the islands of Moskenesøya (North) and Mosken (South), it has a treacherous current. Strong local winds make the passage additionally dangerous. The word maelstrom entered the English language via fiction novelists who exaggerated the current of the channel into a great whirlpool (e.g. Jules VERNES, in “Vingt Mille Lieues sous les Mers”). In English, the word “maelstrom” designates a large, fatal whirlpool, engulfing vessels and men, or a figurative application of the idea.

Notable oceanic whirlpools include those of Garofalo along the coast of Calabria in southern Italy, and of Messina in the strait between Sicily and peninsular Italy. Whirlpools near the Hebrides and Orkney islands, and in the Naruto strait between Awaji and Shikoku islands, are also well known. In Western Scotland, the Corryvreckan whirlpools are said to be “one of the most notorious stretches of water anywhere around the British Isles”. The Naruto Strait (Naruto kaikyo) connects the Awaji and Shikoku islands, Japan. The strait is 1.3 km wide. The tide is semi-diurnal and the tidal range may be up to 1.7 m. The differences in tidal levels across the strait may reach 1.5 m with current speeds exceeding 9 knots (4.6



Naruto whirlpools on 17 October 2001 - View from a tourist boat, looking upstream at a whirlpool in foreground and the grounded ship in the background

m/s) on the Northern part of the Strait. The notorious “whirlpools” (uzu-maki) take place on the Southern side of the Strait at the peak of the flood and ebb currents. The flow (or flood) and ebb are also called southward and northward currents respectively.

The writer visited the Naruto whirlpools on Wednesday 17 October 2001. The meteorological conditions were poor because the centre of Typhoon No. 21 was located few hundreds kilometres South of Japan. The ebb current was maximum around 12:20 pm. The waters flowed from the Inland Sea (Setona Kai) to the Pacific Ocean. The whirlpools were best seen next to the Southern bridge pier. H. CHANSON experienced the whirlpools between 10:45 am and 12:45pm, first from the Ohnaruto bridge walkway (uzu-no-michi) and later in a boat (Fig. 1 and 2). From the bridge, the writer saw a freighter which became trapped in the whirlpools and vortices, and got stranded (grounded) beneath the bridge around 11:00 am. The boat was still grounded 2 hours later, waiting for the next high tide (Fig. 2). Figure 1 shows a street of vortices with a freighter in the background. The photograph was taken on the Southern end of the Strait, 45 m above the sea and about 450 m from the bridge abutment. The main current flows on the left of the vortices. Although the turbulence appears less intense, the ship was subjected to a faster current and to the effects of large-size cauldrons. Figure 2 presents a view

from downstream. A whirlpool is visible in the foreground of the photograph. The grounded freighter (green hull), stranded next to the bridge pier, is visible in the background.

Full details of the visit of Naruto whirlpools are at : <http://www.uq.edu.au/~e2hchans/whirlpl.html>. The website includes further photographs and links to relevant websites on whirlpools.

Acknowledgments

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References

- [1] VAN DYKE, M. (1982). “An Album of Fluid Motion.” Parabolic Press, Stanford CA, USA, 176 pages.
[2] GJEVIK, G., MOE, H., and OMMUNDSEN, A. (1997). “Sources of the Maelstrom.” Nature, Vol. 388, 28 Aug 1997, pp 837-838.

Table 1 - Characteristics of large whirlpools

Strait :	Naruto	Maelstrom	Saltstraumen & Sandstraumen	Corryvreckan
Other name(s) :	Naruto kaikyo	Moskstraumen	Saltfjord & Skjerstadfjord	Corrievrekin, Charybdis
Country :	Japan	Norway	Norway	Scotland
Location :	between Awaji and Shikoku islands	between Lofoten Point and Vaerøy island, Lofoten islands	50 km North of Bodø	between Scarba and Jura islands, Western Scotland
Tidal range :	up to 1.7 m	-	up to 3 m (?)	-
Strait width :	1.3 km	8 km	-- (Sandstraumen) -- (Saltstraumen)	-
Current speed :	up to over 9 knots (4.6 m/s)	up to 7 knots (3.6 m/s)	-	up to 9 knots (4.6 m/s)
Whirlpools :	Large whirlpools on the Southern end during ebb	-	-	-
Access :	Views from Ohnaruto bridge and from tourist boats	-	Two straits : the Sandstraumen and the Saltstraumen View from the bridge crossing	-

FMTM2001

8th International Symposium on Flow Modeling and Turbulence Measurement

The 8th International Symposium on Flow Modeling and Turbulence Measurement (FMTM) was held in the Central Administration Building of the Nihon University, located in the central Tokyo, Japan, December 4-6, 2001. The first one was held in Paris in 1982 and seven symposia on the same subjects have been successively held since then every two to three years, in Iowa City (USA), Tokyo (Japan), Wuhan (China), Paris (France), Tallahassee (USA), and Tainan (Taiwan). This symposium was sponsored by IAHR and co-sponsored by American Society of



Committee and section members' get together