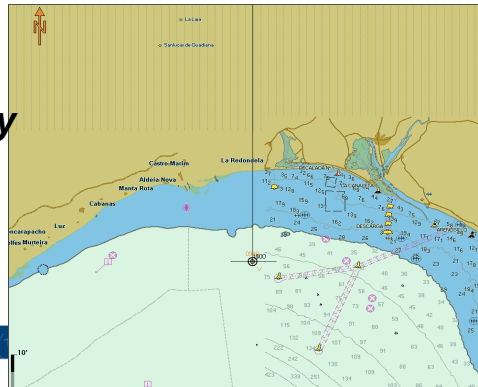


Improving ENC consistency Application of SCAMIN

- **Current status and concerns**
- **Cartographic and safety issues**
- **Recommendations**

NSHC28 – Item D2.3



Current status

One common goal: **global seamless and validated ENC coverage**

Mariner requirements: ENC should be consistent and easy to use

More than 7 400 ENCs worldwide, after 10 years of production and still...discussions about consistency

→ IHO guideline (CL108/2007, Nov. 2007) for a **consistent application of SCAMIN...** *should be used for all ENCs*

It provides a detailed SCAMIN attribution table as a « reference baseline », **not mandatory and not part of S57 standard.**

Concerns

FR believes that **the application of SCAMIN on all ENC's, without further tests and studies would be harmful for ENC safety and consistency.**

Validity and usefulness of the SCAMIN concept in its present state of development are not demonstrated (in terms of cartography and safety):

- Is the SCAMIN concept and effect controlled by producers or mariners ?
- Is an ENC displayed with SCAMIN safe for navigation ?
- Isn't it an utopian concept intended to replace incomplete charts portfolios?
- Is SCAMIN really useful for ENC's ?

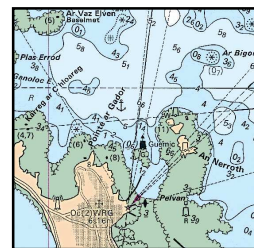
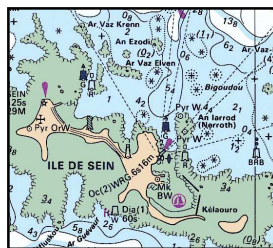
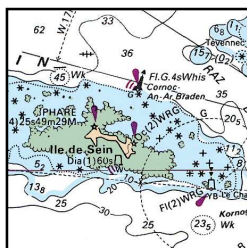
(and if SCAMIN were really useful, there is no strategy defined yet to re-process the 7400 already produced ENC's. This will obviously lead to inconsistencies).

- finally, FR is convinced that SCAMIN, as it is, is going to worsen the current inconsistencies

Concerns in terms of cartography

S57 standard states that : “[SCAMIN] purpose is to reduce clutter, to prioritise the display of objects and to improve display speed”.

Application of SCAMIN is then basically a display issue, close to generalization.



*SCAMIN might be useless when a complete ENC portfolio exists, produced and compiled as paper charts, with an intended display scale. It may only be useful for very special cases, and **not all ENC's** !*

Concerns in terms of cartography

What is then the aim of applying SCAMIN in the data itself ?

Automatic generalization ?

⇒ this requires human expertise and cannot be reduced to a simple table

Reducing screen clutter ?

⇒ ECDIS standardized fonctionnalités are already available for this purpose (Display base / Standard display).

Global ENC consistency ?

⇒ No SCAMIN at all or a display function could be a better solution ?

Is SCAMIN really useful for all ENCs ?

Is SCAMIN concept really controlled and mastered ?

Concerns in terms of cartography

Generalization requires human expertise and cannot be reduced to a simple table.

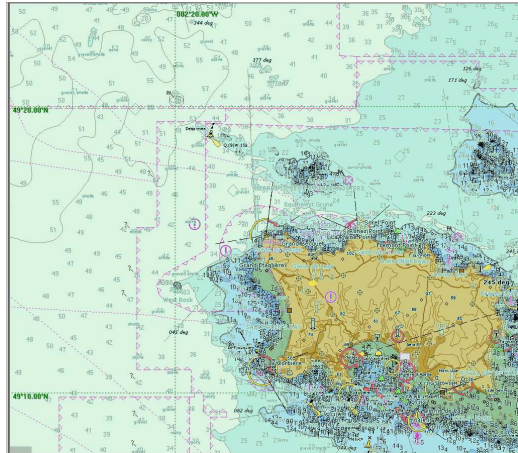
Evidence of this is that the IHO recommendation (§ 2.4 and 2.5) provide additional guidelines for human intervention in order to tackle the remaining issues : "the unsettling situation where an object disappears and then reappears as the user zooms out".

→ Application of SCAMIN does need much more work than a single SCAMIN « switch »

ECDIS functions for clutter reduction

Comparison between ECDIS “standard display” and SCAMIN application

ENC
displayed
with the
SCAMIN
mode « off »
e.g all objects



1:50 000 compilation scale ENC viewed at scale 1:140 000

Improving ENC consistency - Application of SCAMIN

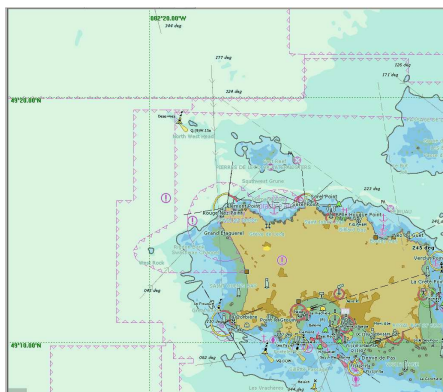
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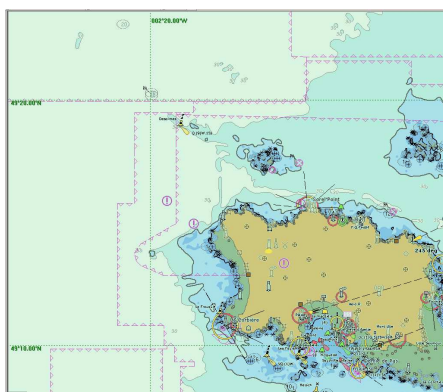
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ECDIS functions for clutter reduction

Standard display



SCAMIN



=> No added value with SCAMIN application compared to Standard display

Improving ENC consistency - Application of SCAMIN

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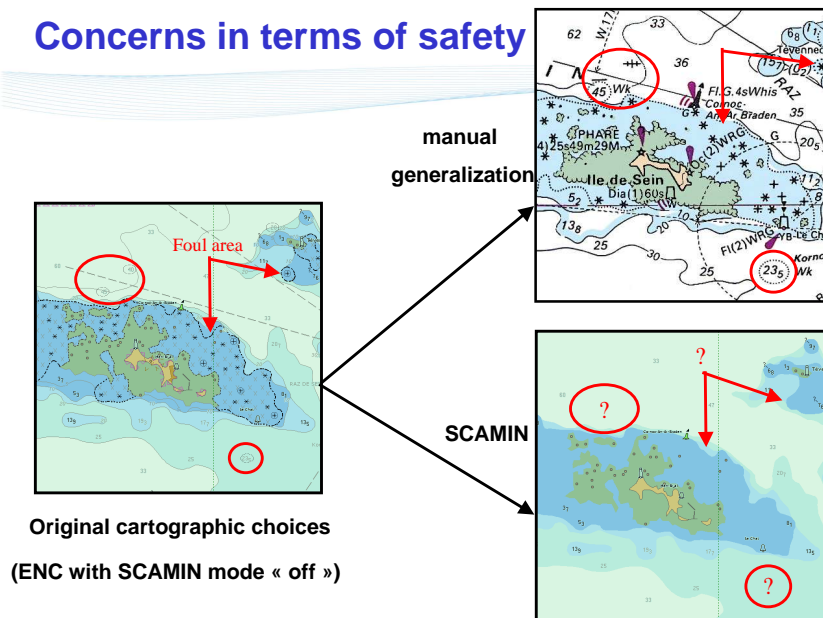
Concerns in terms of safety of navigation

Every feature on a nautical chart is significant and nautical charts are designed considering that all the features will be displayed to the mariner.

It is agreed that with ECDIS, the mariner may use nautical charts in a different way than in the paper world. However, we have little experience on this and Hos should not disregard the way their data are displayed :

- ENC data loading strategy is for example an unsolved issue for ECDIS that will have an impact on the SCAMIN behaviour.
- Application of automatic SCAMIN amounts to uncontrolled generalization and could then be hazardous (see next slide).

Concerns in terms of safety



Concerns in terms of safety of navigation

SCAMIN concept and effects are not controlled by producers nor apprehended by mariners.

⇒ **Is SCAMIN compatible with safe navigation ?**

⇒ **Is SCAMIN compatible with simple navigation system ?**

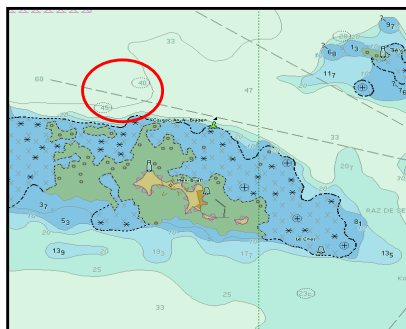
Should there be an ECDIS « warning » note when SCAMIN is in use (such as for Display Base defined by IMO performance standard) :

« *this display is not intended to be sufficient for safe navigation* »

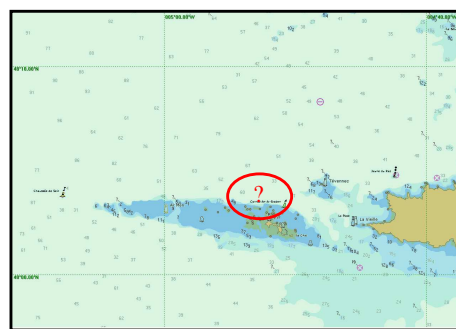
(even if all SENC objects are considered by the system to generate alarms)

Concerns in terms of safety of navigation

Original ENC



ENC with SCAMIN



Should we consider an ECDIS « warning » note when SCAMIN is in use (such as for Display Base defined by IMO performance standard) :

« *this display is not intended to be sufficient for safe navigation* »

Other concerns

Moreover:

- shouldn't we preserve areas where there is already consistency ?
 - * Canada / USA, Baltic: good level of consistency, but with their own SCAMIN rule
 - * La Manche: already consistent with no SCAMIN at all, but UKHO has decided to update all their ENC's (at once?), applying UKHO **own** specific rule .
- the concept is still not mature and needs more tests, experience and feedback. Shouldn't we wait for a more mature rule or re-process all our ENC's every 4 years (in 2004, then in 2008), when the SCAMIN rule is fine tuned ?
- re-process of the 7 400 ENC already available will obviously not be instantaneous and could take a very long time.
- updating already available ENC's will also create transitory internal inconsistencies if it is done progressively.

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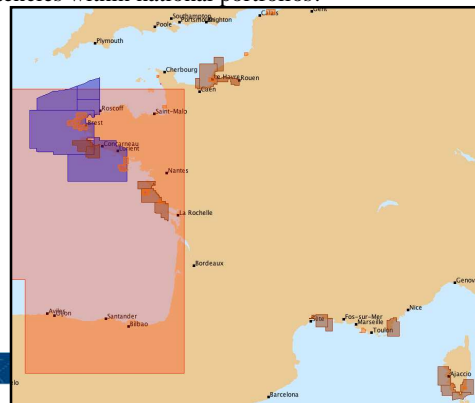
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Updating strategy for existing portfolios?

For instance, if SHOM had updated with the opportunity of new ENC's publications and editions : within 1 year, we can see under the few ENC's that would be upgraded with SCAMIN.

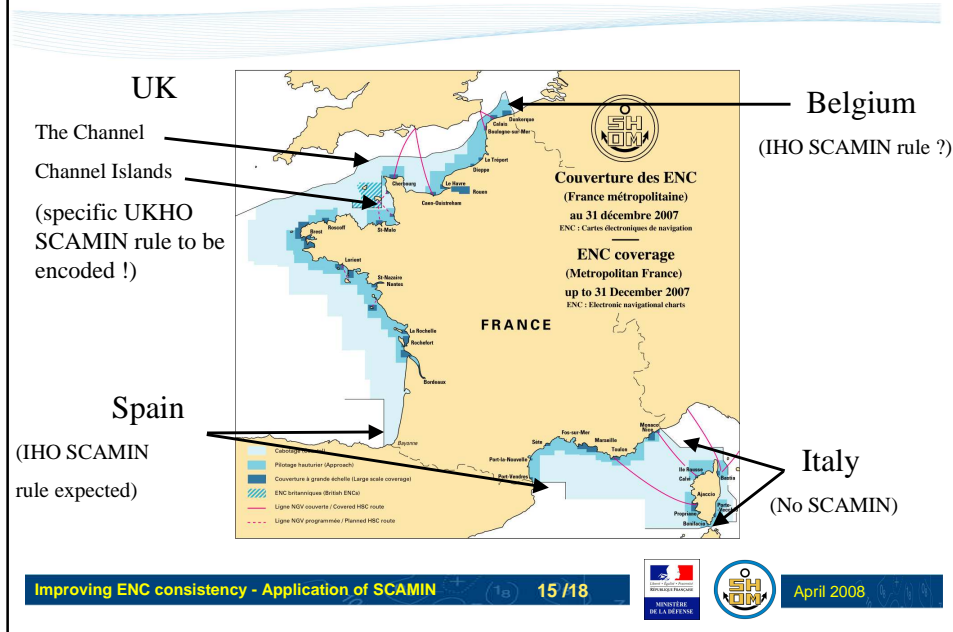
This is the strategy chosen by many HO's, that will not lead to consistency very quickly and that will even create transitory inconsistencies within national portfolios!

new SHOM ENC publications
and editions since March 2007 :
only 40 ENC's out of 200 already
released
(metropolitan France)



Improving ENC consistency - Application of SCAMIN

Example of inconsistencies and coordination need



Conclusion – Recommendations (1/2)

→ Put on hold the application of SCAMIN “for all ENCs”, and preserve areas where there is already a complete and consistent ENC portfolio (within RHCs e.g. **NSHC**)

→ Favour the production of complete ENC portfolios rather than trying to compensate lacks of appropriate scales with the use of SCAMIN (**NSHC**)

→ Confirm if, when using SCAMIN, the ECDIS should warn the mariner that the display is “not intended to be sufficient for safe navigation”

→ a more detailed and professional analysis of the SCAMIN usefulness, effects (including safety) is necessary prior to harmonization (including a strategy for updating within RHCs e.g. **NSHC**) and before mandating SCAMIN application to all ENCs.

Conclusion – Recommendations (2/2)

→ FR proposals submitted for analysis at the next CHRIS/TSMAD (5-9th May) :

(See « TSMAD16 Scamin FR paper » for more details)

→ Evaluate the S52 solution (rather than trying to endlessly fix a display issue at the data level) and clarify the use of SCAMIN compared to display base, and standard display for the user (*the acknowledgment that S-52 requires major revision (IHO CL 26/2008 of 14 March 2008) should be taken into account*)

Questions?



Example of inconsistencies and coordination need

E.g. SCAMIN rule applied by UKHO is very different from IHO recommendation (CL 108/2007):

No SCAMIN is applied to features coming from UKHO's database, including buoys, beacons, landmarks and lights.

What rule should be used by SHOM?

- UKHO rule in the Channel, only for neighbouring cells ?
- and IHO rule elsewhere...
- but no SCAMIN at the border with Italy...

List of features with no SCAMIN on UKHO ENC's

BCNCAR	FORSTC
BCNID	LNDMRK
BCNLAT	LIGHTS
BCNSAW	LITFLT
BCNSPP	LITVES
BUISGL	MORFAC
BOYCAR	OFSPLF
BOYINB	PILPNT
BOYISD	PYLONS
BOYLAT	RADSTA
BOYSAW	RTPBCN
BOYSPP	RDOCAL
CGUSTA	RDOSTA
DAYMAR	RSCSTA
FOGSIG	SISTAT
	SISTAW
	SILTNK
	TOPMAR

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Solutions ?

Cost effective solution : addressing this issue at the display level is obviously more efficient

A solution could be to standardize a SCAMIN function in S52 standard, based on the automatable rule recommended by IHO via CL108/2007. (It already exists in some ECDISes, but missing an IHO validated and controlled default rule)

The first idea, which will need some refinements but shows the interest of such functionality, is a S52 mechanism that:

- is based on a default automatic SCAMIN rule determined and validated by IHO,
- can be switched on and off by the mariner,
- is used with an associated warning (e.g. "the display is not intended to be sufficient for safe navigation when SCAMIN is in use") in order to avoid misuse of the originally compiled ENC;
- where needed, allows ENC producers to keep control of the SCAMIN attribution by overriding the default rule with their value of SCAMIN encoded in the data.

(more details in « TSMAD16 Scamin FR paper »)

But...the updating/type-approval of ECDIS kernels needs to be addressed

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Solutions ?

Strategy ? (Circular Letter)

- Put on hold the application of SCAMIN “for all ENC’s”, and preserve areas where there is already a complete and consistent ENC portfolio
- Indicate that the IHO recommendations is still valid and to be used for those producers willing to encode SCAMIN
- Favour the production of new ENC’s (in terms for new coverage and scale bands) until a detailed analysis of SCAMIN application has been done
- Favour the updating of ENC’s by regions and in close collaboration between neighbouring producers (Regional Hydro. Commissions and RENCs)

Output from Baltic Sea ENC Harmonization WG (BSEHWG) ?

Solutions ?

Indication when SCAMIN is in use on the ECDIS?

- Adding another alarm is not a solution, as we know there are already too much of them.
- Indication ?
- Indication when setting ON the application of SCAMIN ?

Conclusion

There is a need to analyze further the application of SCAMIN on ENC's, due to the following reasons:

- the validity and usefulness of the SCAMIN concept in its present state of development are not demonstrated;
- there is still a need to evaluate whether or not global SCAMIN consistency can be achieved by using display functionalities (controlled by IHO via S-52) rather than data encoding; the acknowledgment that S-52 requires major revision (IHO CL 26/2008 of 14 March 2008) should be taken into account;
- there is still a need for a detailed workable IHO strategy on the application of any SCAMIN updating of already produced ENC's taking into account its impact on new ENC production;
- there is still a need to clarify the use of SCAMIN on ECDIS (compared to the use of existing display mode functionalities), including the opportunity of indicating to the mariner that the display of SCAMINed ENC's might not be fully suitable for safe navigation.