This article is reposted with permission from The Reef-World Foundation, (https://reef-world.org/) a UK registered charity with its roots founded on bringing basic marine ecology to fishing villages and local communities in Thailand. In line with our 2020 theme 'Partnerships for Tomorrow (https://www.youtube.com/watch?v=RqPMtzkiou4)', PATA proudly supports discussions around the topic of sustainability through the Sustainability Matters (https://www.pata.org/pata-sustainability-matters-news-feature/) initiative.

There's been lots of talk in the press recently about the negative effect chemical sunscreens might have on coral reefs. This has left many people with lots of questions: which chemicals are problematic, what impact do they have and, if I can't wear sunscreen, how can I stop myself getting burned?

Here, the team at Reef-World (http://www.reef-world.org/) (the charity which coordinates the Green Fins initiative globally in partnership with the UN Environment Programme (https://www.unenvironment.org/)) digested the latest news and science around potentially harmful sunscreen so you don't have to (unless you really want to!). Here are a few things that might surprise you when it comes to sunscreen and coral reefs:

Some sunscreens may harm coral reefs

Think of a holiday by the ocean and you'll probably imagine slathering on your sunscreen to protect you from the sun when swimming, diving or snorkelling. However, when wearing sunscreen while in the water, it can wash off and enter the water column and recent studies have shown some chemical compounds in sunscreen may harm coral reefs, even in very small

doses.

According to the International Coral Reef Initiative (ICRI) (https://icriforum.org/sites/default/files/ICRI_Sunscreen_0.pdf), “a small number of studies have shown sunscreen and certain individual components of sunscreen can have negative effects on corals and other marine organisms under certain circumstances.”

Coral Reef Image Bank, Jayne Jenkins

There are certain chemicals to avoid

According to research to date, the worst offenders when it comes to chemicals that may harm coral reefs include Oxybenzone (which has been linked to the bleaching of coral fragments and cells, damage and deformation of coral larve and damage to coral DNA and its reproductive success) as well as Octinoxate. Check the label when buying sunscreen and avoid products which include these ingredients. Also try to avoid sunblocks with “nano” particles as these are small enough to be ingested by corals – look for “non-nano” ingredients instead. Lastly, keep an eye out for mineral based sunscreen, rather than chemical sunscreens, as these ingredients have not currently been linked to coral bleaching. And remember, new research is coming out all the time so advice is likely to change as scientists learn more!

Bleached coral in New Caledonia: Coral Reef Image Bank / The Ocean Agency / XL Catlin Seaview Survey

Some destinations have already banned chemical sunscreens

While the scientific research around sunscreen is still in its early days, several destinations are taking a proactive precautionary approach and banning sunscreens that contain harmful chemicals (https://news.mongabay.com/2019/07/u-s-virgin-islands-bans-coral-damaging-sunscreens/).

These include Hawaii and Florida's Key West, which will ban the sale of sunscreens containing oxybenzone and octinoxate from 2021. The US Virgin Islands is also implementing a ban; it will take effect on 30th March 2020 and covers the distribution, sale and possession of sunscreens containing oxybenzone, octocrylene, and octinoxate. Palau has banned oxybenzone, octocrylene, and octinoxate along with several other environmental pollutants and will come into effect in January 1st 2020; Aruba will ban oxybenzone in 2020 and Bonaire will have a ban on all sunscreens containing Oxybenzone or Octinoxate by 1st January 2021.

Taking a proactive and precautionary approach is sensible

Research into reef-safe sunscreen is still in its early stages as scientists work to better understand the threats posed by chemical sunscreens and in which situations.

However, while we're aware there may be a potential issue, it's best to be proactively precautionary. ICRI explains: "Considering the many stresses already faced by reefs and current concerns about the toxicity of certain components of sunscreens to corals, a proactive and precautionary approach to dealing with this issue may be required. Reducing the

amount of harmful sunscreen components that reach the reef environment is a high priority and will require the involvement of governments, reef managers, divers, snorkellers and swimmers, and the tourism and pharmaceutical industries."

ICRI recommends the following measures:

- Encouraging the manufacture of reef-friendly sunscreens
- Promoting the use of reef-friendly sunscreens and other methods of UV protection
- Regulating the sale and use of sunscreens containing toxins
- Exerting consumer pressure to encourage development and use of eco-friendly sunscreens
- Introducing financial disincentives for manufacture and use of potentially damaging sunscreens

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It's always best to check the label!

Many companies are now including a "reef-safe" label on their products to help you identify which don't contain harmful chemicals. However, as new research is coming out all the time, make sure you always check the listed ingredients to be sure!

One of Reef-World's partners, Caudalie (https://www.caudalie.com/), not only has a new range of sunscreen products free of known harmful ingredients but also provided funding to enable the charity to begin implementing its Green Fins initiative in Antigua and Barbuda!

Caudalie's reef-safe sunscreen

Sunscreen isn't the only answer

The risk from chemical sunscreens is that they wash off into the water column and negatively impact coral reefs. When talking about the potential risks of chemical sunscreens, many people are (quite rightly) concerned about the risk of getting sunburn. So remember, there are other simple ways to protect yourself from the sun. Think about the other ways you can protect yourself from strong sunshine while minimising the risk of harmful chemicals reaching the ocean: as well as using

reef-safe alternatives to sunscreens that contain potentially harmful ingredients, find a spot in the shade or cover up with clothing to protect yourself from strong sunshine (our partners at Fourth Element (https://fourthelement.com/) have some fantastic rashguards).

Sam, Mel and Jula from The Reef-World team in their Fourth Element rash guards and wetsuits.

Reef-safe sunscreen policies are now included in the Green Fins Code of Conduct

As you might already be aware, the Green Fins Code of Conduct now includes reef safe sunscreen policies. This is included in the assessment criteria to ensure your business, as part of the Green Fins network, is following ICRI's guidelines regarding the impact of sunscreens on coral reefs.

Dive and snorkel operators can help spread the word

Reef-safe sunscreen is a relatively new issue so Green Fins members, and other dive and snorkel operators, can play their part in educating guests and encouraging positive sunscreen behaviours. An effective sunscreen policy should include:

- Encouraging customers to cover up in the sun
- Ensuring your staff know to ask guests to avoid using traditional sunscreens when they will come into contact with the sea
- Making sure non-reef safe sunscreen is only used when there is no risk of it entering the marine environment
- Ensuring your guests are aware of your sunscreen policy (e.g. briefings, posters, pre-trip information)

Help is at hand!

To help your dive business implement its new sunscreen policy, the following new materials have been added to the Green Fins Toolbox:

(https://portal.greenfins.net/en/Posters)

Remember, these are free to download (https://portal.greenfins.net/en/Posters), display and share so feel free to use them in your own dive or snorkel operations.